BCMJ
BC Medical Journal
September 2016; 58: 7
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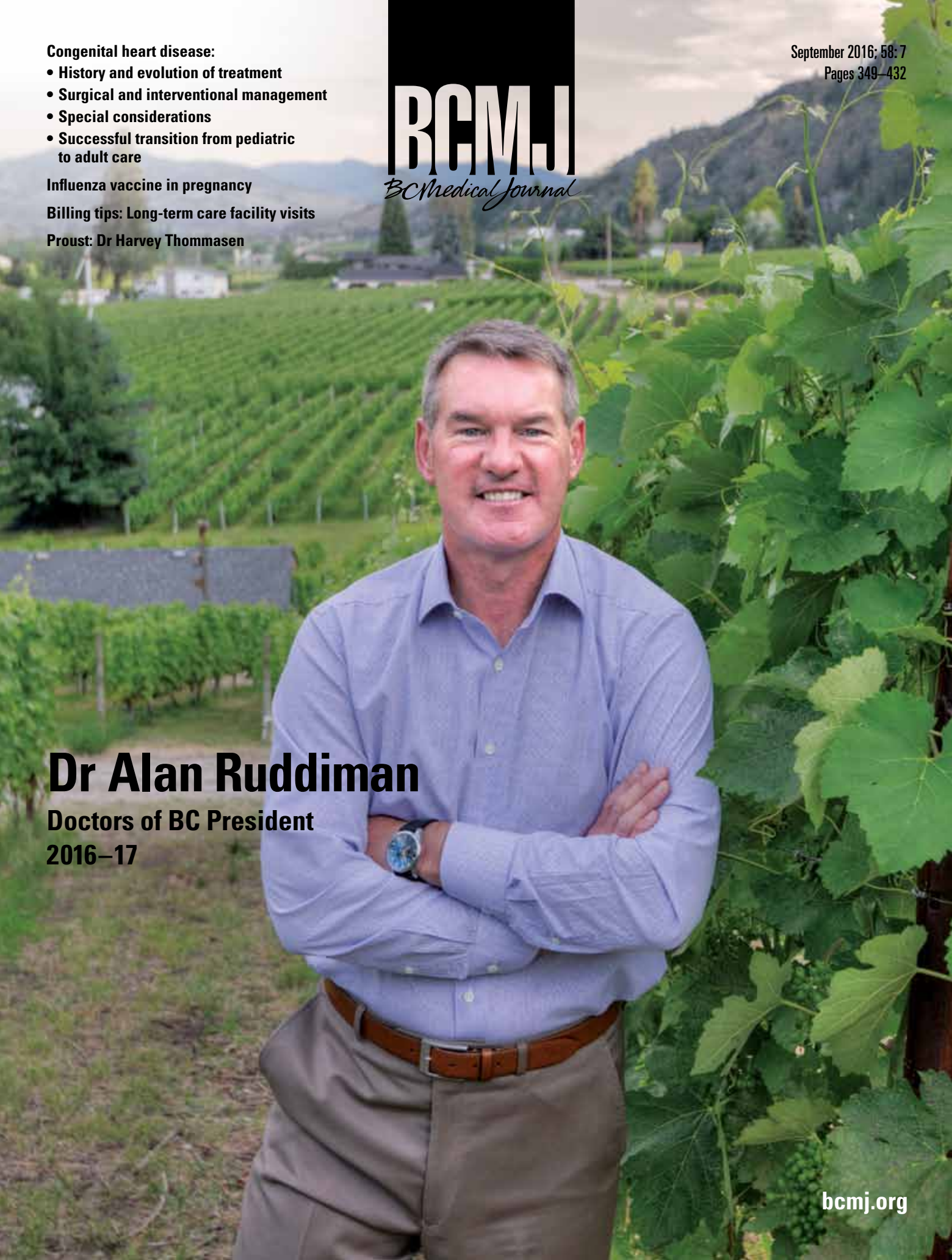

Dr Alan Ruddiman

Doctors of BC President 2016–17

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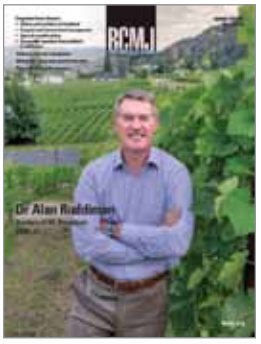
doctors of bc

September 2016
Volume 58 • Number 7
Pages 349–432

BCMJ
BC Medical Journal
Established 1959



ON THE COVER: Dr Alan Ruddiman at the Spadefoot Toad Vineyard near Oliver, BC. Read about Dr Ruddiman's family and professional background, his life experiences, and his ideas for the future of health care in BC in the interview beginning on page 410.

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THEME ISSUE: CONGENITAL HEART DISEASE

OPINIONS

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ISSN: 0007-0556

PRINTED IN BC

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The *BCMJ* is published 10 times per year by Doctors of BC as a vehicle for continuing medical education and a forum for association news and members' opinions. The *BCMJ* is distributed by second-class mail in the second week of each month except January and August.

Prospective authors should consult the "Guidelines for Authors," which appears regularly in the *Journal,* is available at our website at www.bcmj.org, or can be obtained from the *BCMJ* office.

Subscriptions

Single issue	$8.00
Canada per year	$60.00
Foreign (surface mail)	$75.00

Postage paid at Vancouver, BC. Canadian Publications Mail, Product Sales Agreement #40841036. Return undeliverable copies to *BC Medical Journal*, 115-1665 West Broadway, Vancouver, BC V6J 5A4; tel: 604 638-2815; e-mail: journal@doctorsofbc.ca

Let's discuss

Recently our profession has faced a number of controversial issues—physician-assisted dying, narcotic prescribing for nonmalignant pain, and the use of medicinal marijuana to name a few. I'm not an expert on any of these issues so naturally I will tell you how things are.

The process of legalizing doctors to aid in the deaths of their patients has brought forth strong emotions on both sides of the issue. Words such as "killing," "murder," "torture," "inhumanity," and more have been used to bolster one position or the other. I believe most patients, if offered good palliation, would choose not to end their life. But, on the other hand, how do you effectively palliate conditions such as amyotrophic lateral sclerosis? To observe your body dying around you is not a death I would wish on anyone.

The College's recent standards and guidelines on prescribing narcotics for chronic nonmalignant pain have raised the ire of a number of physician groups. Walking the line between reducing prescription drug abuse/deaths and alleviation of suffering is difficult indeed. However, in my over 20 years of clinical practice, I can count on one hand the number of patients for whom daily narcotic use for chronic nonmalignant pain improved quality of life.

It is an honor to publish the various opinions of our readers and act as a vehicle of respectful discourse in all matters. We might not always agree, but we are definitely in this together, so please continue to send in your thoughts and musings.

The ever-increasing use of medicinal marijuana is also quite polarizing. I have had a number of dying patients report that marijuana eased suffering and made their last days more comfortable. However, I now have patients using medicinal marijuana for fatigue, insomnia, depression, fibromyalgia, musculoskeletal discomfort, and more. These prescriptions didn't come from my hand, but none of my patients had any trouble obtaining them. I am troubled by the large number of people taking a central nervous system active substance with little scientific evidence to support its use.

Why bring up these controversies? The *British Columbia Medical Journal* is the perfect place for BC physicians to share their points of view on all topics. It is an honor to publish the various opinions of our readers and act as a vehicle of respectful discourse in all matters. We might not always agree, but we are definitely in this together, so please continue to send in your thoughts and musings.

—DRR

The future is not what it used to be

Over the years hundreds of millions of tax dollars have been spent on over 300 government health care task forces and commissions; 25 years ago BC's Royal Commission on Health Care and Costs (the Seaton Commission) made its recommendations for health reform. Ministers of health, deputy ministers, and health bureaucrats across Canada embraced and implemented many of the BC proposals, including the following: "The commission recommends that the Ministry of Health and the BCMA give priority to the joint development of a program to limit the number of physicians."

Their rationale was that doctors and patients were to blame for rising costs and if we stopped treating patients costs would fall. This assumption was based on now-discredited theories that failed to recognize that rationing leads to delayed care and that waiting costs more. The legacy of their actions was a shortage of doctors, as Canada dropped in the rankings of doctor supply to 26th in the world (when I started practice we were fourth). Commissioner and UBC economist Robert Evans had earlier written, "A central cause of the problem was the oversupply of physicians, which tended to generate greater utilization of services; there are too many doctors; and a supply-induced demand; a bed built was a (hospital) bed filled." His philosophies dominated the report.

When reflecting on the frenzy and turmoil that consumed communist China in the 1950s during Mao Tse-tung's Great Leap Forward, volunteers commented that what seemed completely normal at the time seemed like madness after the fact. I believe we will look back on our current health system with similar sentiments.

More recent commissions have also been failures. The Romanow Commission endorsed the status quo. Senator Kirby's Commission made creative suggestions, such as patient-focused funding and a care guarantee. These would empower patients and limit the monopoly control of governments. The report of the BC Select Standing Committee on Health concluded, "Your Committee recommends improved wait-list management not a health care guarantee." (Translation: let's study and manage wait lists, rather than fix them.)

Other tax-funded experts endorsed this approach. They have dominated health policy in Canada. Jonathan Lomas, former executive director of the Canadian Health Services Research Foundation, made his views clear when stating, "I think we have to be very careful about empowering the consumer because they will make choices that are not in their own health interest."

Dr Charles Wright, former VP at Vancouver General Hospital, wait-list consultant to the BC Ministry of Health, Health Council of Canada member, and recipient of an $850 000 grant to study wait lists, stated, "Administrators maintain waiting lists the way airlines overbook. As for urgent patients in pain, the public system will decide when their pain requires care. These are societal decisions. The individual is not able to decide rationally."

Yet another expert, Dr Gordon Guyatt, a former NDP candidate, co-founder and leading spokesperson of Medical Reform Group (which later evolved into Canadian Doctors for Medicare), wrote: ". . . adverse health consequences among those waiting for care are few and far between. . . . It is likely that there are areas of Canada in which certain patients—possibly those with cancer, heart disease—wait too long. But the complexities of the wait-list issue suggest careful study and planning before we try to solve a problem that may be much smaller than we imagine." These examples reflect the arrogance of government-funded advisors and explain why input from patients and practising physicians has been discounted.

Reform may come soon as patients gain their freedom after an objective and impartial evaluation of the facts and evidence by the courts. After an almost 8-year delay, our constitutional trial begins this September. I foresee that within 5 years following the judgment all patients in Canada will have rapid access as wait lists are dramatically shortened. Medicare will be expanded to cover prescription drugs, physiotherapy, dentistry, prosthetics, etc. (areas now inexplicably excluded by arbitrarily designating them medically unnecessary). Funding will come from the economic savings of shortened waits and added revenues as wealthier Canadians are encouraged to contribute more than the less wealthy.

In Canada, lower socioeconomic groups have the least coverage, poorest access, and worst outcomes. Both Statistics Canada and independent study groups around the world have verified this. In 2010, Italian health law expert Giandeomenico Barcellona, wrote, "I am very fond of Canada, one of the best countries in the world, but this (Canada's health) system is tailor made just for very rich people, who can get medical care abroad."

Change is on the way. In the hybrid system that evolves, the poor and economically deprived will benefit as wait lists disappear. The only advantage the rich will experience is their ability to access timely care in Canada. Governments and citizens will enjoy the massive economic benefits that result from reduced disability and work loss.

Sadly, for some health policy experts and economists, they will find that the end of wait lists will mean that their tax-funded grants to study them will likewise disappear.

—BD

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Letters of less than 300 words are welcomed provided they do not contain material that has been submitted or published elsewhere; they may be edited for clarity and length. Letters may be e-mailed to journal@doctorsofbc.ca, submitted online at bcmj.org/content/contribute, or sent through the post and must include your mailing address, telephone number, and e-mail address.

Medicinal cannabis: Concern with College standard

Medicinal cannabis presents a unique dilemma for physicians and regulatory authorities because it represents an unapproved treatment with limited good-quality research to inform guidelines that clarify specific age-related indications, dosage, or risks. In addition, many myths portray negative effects, which results in a culture of ill-informed lack of medical support. Despite these barriers physicians have been designated as the gatekeepers of access to cannabis for medical purposes. On 5 May 2015 the College of Physicians and Surgeons of British Columbia (CPSBC) published a standard entitled *Marijuana for Medical Purposes*, to set out the professional requirements of physicians in BC who plan to support patients in the use of cannabis for medical purposes.

Practitioners for Medicinal Cannabis (PMC) is a nationwide network of specialists and general practitioners among whom there is extensive clinical experience in the medicinal use of cannabis. PMC is committed to best possible patient care, including the informed use of cannabis and cannabis-derived products. As participants in PMC, we write as a group of physicians to share with readers of the *BCMJ* our concerns about some of the statements included in the CPSBC standard. We also offer access to an information resource and networking with PMC.

PMC concerns

First, we consider that the CPSBC standard fails to acknowledge or accommodate the unique and complex nature of cannabis, or how it is used for medical purposes. Cannabis is not a single therapeutic entity. The plant contains many different physiologically active compounds with a wide variety of potential therapeutic uses. Different strains possess a different balance of components, specifically in the balance of THC to CBD. In spite of the commonly held perception that cannabis is smoked, there are other safer, less stigmatized ways to prepare cannabis for therapeutic applications. Effects of a particular product on one clinical situation cannot be assumed to apply to

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How is Doctors of BC doing in meeting your needs? You told us and we are listening

Better together. You will often hear me repeat these are two words when I'm communicating with our members. Quite simply it means that when we are united as a profession and working together, we really can make a meaningful difference. You have probably also seen the two words associated with our Doctors of BC logo (Better. Together.). That's because they form the foundation of the work we do with and for our members. Though to do this work, we need to know your thoughts on how we're meeting and addressing your needs—where we are doing well and, even more importantly, how we can improve in the areas that are a priority for you.

To garner this information we conducted a comprehensive member survey earlier this year to measure engagement—how we are engaging and interacting with you and how you are engaging and interacting with your health authorities. We also asked some overarching questions on your impressions of how we are doing as an association. We received a response rate of 20%, which is an excellent response for this kind of survey and what now provides the basis for a statistically sound analysis. The almost 2500 responses were also demographically and geographically representative of the broader membership.

In general, most of our physician members feel we are doing a good job, but we can do better. We want to do a great job in serving and addressing your needs.

The majority of respondents said they are pleased with the work we do in representing you, consulting with you, and advocating for your issues with government. You identified three key areas of priority: negotiations, policy development to support members on ministry and health authority initiatives that impact you, and member consultation.

Respondents further identified two additional key areas where you think we can do a better job. You told us that you want us to be more timely and proactive, and you want us to provide more ways to share and communicate your views on issues that are important to you. The association commits to giving these areas high priority and attention as we move forward.

We also asked members about how well they are engaging with their health authorities. Many of you feel your professional voice is not being heard at that level, nor do you have the opportunity for credible input into health authority decisions. You will find detailed information about this in the survey results available in the Members Area of the Doctors of BC website. Doctors of BC is communicating these results to the health authorities and to government to help foster stronger and more positive professional relationships that benefit our patients, the health care system, and the profession.

I can assure you that work is already underway to address your areas of concern, especially with regard to health authority relationships. We have been and continue to support physicians to better engage with their health authorities through the creation of the medical staff associations (MSAs), created by our most recent Physician Master Agreement. In many respects the MSAs will play a key role in helping to achieve these objectives by fostering two-way communication and open dialogue between facilities-based physicians and health authorities. This will help provide the opportunity for our physicians to not only have a stronger and legitimate voice, but to have a voice that is also authoritative. We now have 77 sites involved at various stages of development, with a target of having 50 of those sites approved for full operational funding by January 2017. Whereas the MSAs will strengthen the physician voice and professional leadership in our province's facilities, the divisions of family practice are already providing a strong voice for family doctors working in the community.

The information we gathered through the Member Engagement Survey will help develop our 2017 3-year strategic plan. The data and responses will be used by staff as they adapt and enhance our member programs and services.

I want to thank the many members who participated in the survey, and I encourage all members to speak up and provide your input, not just through our surveys, but continually.

Doctors of BC is committed to providing the best professional value to you, and your input enables us to do just that. Your voice is important to me and to our association, so please don't hesitate to connect with me at president@doctorsofbc.ca and follow me, like many of your peers do, on social media via Twitter @awruddiman.

—Alan Ruddiman, MBBCh, Dip PEMP, FRRMS
Doctors of BC President

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other products or clinical contexts, and each individual patient's response is unique.

Second, we believe that the CPSBC standard fails to recognize the significance and importance of existing scientific literature. In particular, this includes the enormous and growing literature regarding the body's endocannabinoid system with which cannabis interacts. As many readers are aware, large-scale double-blind controlled trials are not the only resource that informs clinical knowledge. There is a considerable body of sound evidence to support the use of cannabis for medical purposes that also confirms its relative safety, especially compared with other agents.

The CPSBC standard also fails to acknowledge appropriately the context of more questionable studies that underpin some of the well-established but misinformed myths around cannabis. Given the complex nature of cannabis, it is relevant to note that studies that report on or make correlations between cannabis use and specific outcomes, but which don't also take into account or adequately address pertinent variables (THC/CBD content, THC/CBD ratios, confounding factors such as cigarette smoking or other drug use, pre-existing mental health issues, age, genetic factors, and recreational versus medicinal cannabis use), cannot be replicated or confirmed in a meaningful way. It is also questionable whether conclusions drawn about cannabis from studies of recreational users can be extrapolated to its use in a medical context.

Third, we question the appropriateness of the College warnings to physicians who consider authorizing legal access to cannabis. The College's position presents an alarming perspective of a physician's risk in authorizing the use of cannabis; for example, "may be the subject of accusations or suggestions of negligence, including liability if the use of marijuana produces unforeseen or unidentified negative effects." This risk is not substantially different from that of prescribing any other substance or undertaking any medical procedure.

Fourth, we take issue with the College's prerequisite that conventional therapies be attempted before cannabis. The College standard lists eight requirements for physicians. The first of these says the physician shall: "Document that conventional therapies for the condition for which the authorization of marijuana for medical purposes was provided have been attempted to assist the patient in the management of his/her medical condition and have not successfully helped the patient." We are concerned that this requirement does not duly respect a patient's personal autonomy and right to make decisions pertaining to his/her own health care. We recommend that the word "attempted" be replaced by "considered."

Fifth, we are concerned that the CPSBC standard, through its several requirements and restrictions on physician behavior, creates a barrier to care for patients. In addition, the standard does not put the physician's role or the College's responsibility into an appropriate societal context. Federal courts have deemed use of cannabis for approved medical purposes to be a Charter right, protected by the Constitution. The College's mandate of public protection through effective regulation of the medical profession includes protection of those disabled and seriously ill patients who benefit from the medical use of cannabis. The College standard presents considerable challenges for a physician who wishes to provide the professional support that a patient needs in order to exercise his or her constitutional right.

A helpful resource

The College standard lists a number of groups of patients for whom "cannabis is generally not appropriate," but acknowledges that there are circumstances where exceptions may be made. Several members of our group have co-authored a summary of the relevant literature informing the use of cannabis in the care of such patients. Our intention is to provide a clinical perspective and a nuanced discussion to help physicians balance potential risks against potential benefits when considering a trial of a cannabis-derived product for an individual patient.

If any physician is interested in obtaining an online copy of that summary, please contact the Practitioners for Medicinal Cannabis by e-mail at pmcaccess@gmail.com and include "BC standard" in the subject. Any health care practitioner is welcome to participate in PMC, or to submit a question to the network. Through that e-mail address PMC participants share resources and questions about clinical cases, and discuss issues related to the medical use of cannabis.

The following physicians, in alphabetical order, endorse the content of this letter. They are all participants in PMC.

—Donna Dryer, MD, FRCPC
—Caroline Ferris, MD, CCFP, FCFP
—Gwyllyn S. Goddard, BSc, CCFP, MD
—Peter A Gooch, MB ChB
—Philippa Hawley, FRCPC
—Cecil Hershler, MD, PhD, FRCP(C)
—Gill Lauder, MB BCh, FRCA, FRCPC, CPE
—Caroline MacCallum, FRCPC, BSc
—Ian Mitchell, MD, FRCP
—Michael Negraeff, MD, FRCPC
—Conrad Oja, MD, PhD, FRCPC
—Arnold Shoichet, BSc, MD
—Christine Singh, MD, CCFP

College replies

The College appreciates the opportunity to respond to a letter regarding its professional standard, *Marijuana for Medical Purposes*. According to the Health Professions Act (HPA), the role of the College is to establish, monitor, and enforce standards of practice to reduce incompetent, impaired, or unethical practice. The regulation of medical marijuana is an obligation that medical regulatory authorities across Canada have been reluctant to take on. The revisions to the Medical Marijuana Access Regulations essentially removed Health Canada from any oversight of the use of this substance.

When the College's Ethics Committee drafted the standard regarding medical use of marijuana, it reviewed the considerable experience of the state medical boards that have been regulating this aspect of practice for a while. Published and personal reports

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emphasized the importance of documenting a professional interaction with the patient, which includes taking a history, conducting an examination, considering a differential or provisional diagnosis, formulating a treatment plan, and following the patient. It may seem unnecessary to remind physicians to act professionally in this regard, but multiple instances of documents being signed with no or minimal patient interactions had been identified. The College did not want to have the entire profession disgraced because of a few individuals exchanging their signature for a fee—and not much else.

Turning to the specifics in the letter, the College standard is not a clinical practice guideline so it does not address how marijuana is used for medical purposes. The paucity of scientific evidence is acknowledged by the authors of the letter, and is noted on the Health Canada website as well as the College standard. The College doesn't evaluate studies, scientific or otherwise, in the context of ethical and professional standards. This is the purview and responsibility of subject matter experts who draft clinical practice guidelines.

With respect to the cautions in the standard, the College is reminding physicians that as a natural substance, marijuana use is not without potential harmful effects. Given the high rate of recreational use and the lack of legal access to marijuana, the lines between true medical use and convenience for recreational use are blurry. Even in jurisdictions that authorize medical use and lawful recreational use, recreational users may still seek out medical authorization because it is cheaper.

The College is encouraged that the federal government is moving to legalize recreational use of marijuana. This will no doubt alleviate pressure on the existing medical access pathways. The foundation of the College's standard—that medical marijuana is a treatment decision based on a professional interaction with the patient, weighing the unique risks and benefits for each patient, and in the context of a longitudinal relationship—is to ensure good medical practice.

Readers may wish to review the Federation of State Medical Boards' *Model Guidelines for the Recommendation of Marijuana in Patient Care*, adopted as policy in April 2016. Like the College standard, the guideline addresses similar important topics: the physician-patient relationship, patient evaluation, informed and shared decision making, treatment agreements, qualifying conditions, ongoing monitoring and adapting treatment plans, consultation and referral, medical records, and physician conflict of interest.

The College hopes that continued research and the development of pharmaceutical cannabis-derived products provided through traditional prescription/pharmacist dispensing will soon be reality. When recreational use of marijuana is legalized, taxed appropriately to increase revenues for the publically funded health care system, and sold responsibly through provincial agencies that have a solid track record of not selling alcohol to children, physicians will be able to perform their customary role where substance use is concerned: counseling patients to moderate their consumption.

—Gerrard A. Vaughan, MD
President, College of Physicians and Surgeons of British Columbia
—Heidi M. Oetter, MD
Registrar and CEO, College of Physicians and Surgeons of British Columbia

Re: Ah, the good ol' days

The editorial "Ah, the good ol' days. Nary an orphan in sight." (*BCMJ* 2016;58:244) provided a simplistic description of the growth of hospital medicine (a.k.a., hospitalist programs) in BC. It also included a number of misleading statements.

For example, the author claims that "patients who were cared for by their own GP had shorter hospital stays" than those cared for by hospitalists. No references are provided to support this claim. In fact, numerous studies in the United States, and some limited evidence from Canada, have shown the opposite—hospitalists reduce length of stay compared to nonhospitalists,[1-3] while reducing hospital costs and possibly also improving quality of care.

There are clearly advantages to the traditional model of inpatient care provided by a patient's own GP. Good continuity of care is the most obvious example. I have great respect for the dedication of my GP colleagues who maintain busy community practices as well as hospital privileges. The medium-sized community where I work is fortunate to have a strong hospitalist department that has regular contact and an active collegial relationship with the community-based family physicians, both those with and without active hospital privileges.

—Scott D. Smith, MD, CCFP, MSc
Hospitalist, Kelowna

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The editor replies

Thank you for your response letter to my editorial. I have great respect for my hardworking hospitalist col-

leagues and meant no disrespect. My piece reflects the statistics and experiences at my hospital and was meant to be a tribute to the valuable contribution made by family physicians through the years.

—Ed

Re: Addressing existential suffering

I enjoyed reading Dr Bates's excellent article on addressing existential suffering in patients with terminal illnesses (*BCMJ* 2016;58:268-273). Spiritual/religious issues are important for many of our patients, not just those facing end-of-life issues. A study of 2000 physicians published in 2007[1] indicated that most psychiatrists and nonpsychiatric physicians believe that religion/spirituality helps patients cope with and endure illness and suffering by offering a positive, hopeful state of mind and/or a community that offers emotional or practical support. Over the years I have recommended that medical students, psychiatry residents, and residents in other disciplines routinely ask patients about their spiritual beliefs and how they would like them to be addressed. Dr Bates included a copy of the FICA spiritual history tool in his article. I would highly recommend that the FICA be used routinely with patients, especially those who have chronic illness and suffering. It could be used as a brief screening tool, similar to the CAGE questionnaire, which is commonly used to screen for alcohol/substance abuse. Over the years I have seen no negative effects from asking patients about spiritual issues. Instead, it usually improves rapport and contributes to a positive doctor-patient relationship. Patients can be referred to appropriate spiritual care resources as needed, but physicians should not neglect identifying important spiritual/religious issues that may be affecting a patient's well-being.

—Stephen D. Anderson, MD, FRCP(C)
Clinical Associate Professor, UBC Faculty of Medicine, Dept. of Psychiatry

Reference

1. Curlin FA, Lawrence RE, Odell S, et al. Religion, spirituality, and medicine: Psychiatrists' and other physicians' differing observations, interpretations, and clinical approaches. Am J Psychiatry 2007;164:1825-1831.

Re: Thoughts on professionalism

In response to our president's "Thoughts on professionalism" in the June issue (*BCMJ* 2016;58:247), I would like to add comments pertaining to his third tenet of our profession's longstanding tradition—the value and merit of the social contract.

This longstanding tradition of a historically great and independent profession predates this country's tiny historical anomaly of forced and unconstitutional social contracts—a contract that is with the state rather than with the patient, contrary to our Hippocratic Oath. Forced because we have a single payer that has legislated a monopoly, and because doctors must travel abroad to change their employers. Unconstitutional because it is a rationing monopoly, at least hurting patients in need.

The issue has become far more concerning recently for patients and physicians alike because the topic of physician-assisted death now also raises the uncomfortable question of whether physicians have finally become de facto agents of the state in this country.

Since professionalism is rather defined by skills, good judgment, and polite behavior that is expected from a person who is trained to do a job well, we should ask ourselves: where has our collective independence of thought and actions necessary to support good judgment gone lately? And

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will our patients be better off for its apparent absence?

Advocacy for our patients should be the real cornerstone of our profession, and it requires independence. Fighting internal and external factors that degrade our ability to advocate and care for patients and reverting the erosion of our profession is the ultimate healing goal for the profession itself.

This social contract that imposed itself slowly across several generations, by misrepresenting the original aim of Tommy Douglas, can only be seen as a clumsy ideological vestige of the past. It interferes with our primary commitment: our patients.

Dr Ruddiman, what we are fortunate to have is not that social contract but a direct contract with our patients, and having had an opportunity to acquire an amazing education (rapidly paid back with income tax), lifesaving skills in a very rewarding profession—an old one indeed—all these transcending ideology, generations, postal codes, and bureaucrats. That should be the foundation of our independence.

Our problem is then that we, as a profession, no longer believe that we belong to a great independent profession; rather, we subject ourselves to whatever master of the day is willing to pay us. Mercenaries, agents of the state, whatever you may want to call us, we are no longer the healers of the Hippocratic Oath. The legacy will not be excellent 21st-century medical care and we will be remembered as enablers who replaced the Hippocratic Oath with an oath (little "o") to the state. And isn't that what we do not want to become!

—J.N. Mahy, MD, FRCSC, FACS
Burnaby

President replies

Thank you, Dr Mahy, for sharing your thoughts on the milieu of medical professionalism. This is to be considered as each of us sets out every day to deliver the highest quality of care to all patients across British Columbia. While I agree that physicians would gladly embrace greater independence within our health care system, it is not necessarily the cornerstone with which to effectively advocate on behalf of our patients. Every day, individually and collectively, we as a profession effectively advocate on behalf of our patients, both for their needs and those of our health care system. Doctors of BC is now enhancing this advocacy on behalf of the profession with the development of medical staff associations all across our province to support and grow physician leadership, our influence, indeed our very independence.

—Alan Ruddiman, MBBCh, Dip PEMP, FRRMS
President, Doctors of BC

Safe prescribing (1)

I and every doctor in British Columbia received the new College of Physicians and Surgeons of BC professional standards on safe prescribing last week to address the public health emergency related to opioid overdoses. This is a new professional standard to assist physicians with the challenging task of prescribing opioids, benzodiazepines, and other medications. This was adopted to "direct appropriate prescribing of potentially harmful drugs," and "these professional standards are not discretionary and must be adhered to." We are all directed to document discussions with our patients about the benefit of pharmacologic and non-opioid therapies for the treatment of chronic pain.

The College accepts aggressive pharmacotherapy in the context of active cancer, palliative, and end-of-life care. But it frowns on continuing to prescribe opioids to patients with chronic noncancer pain who, usually, after everything else has been tried and failed, need narcotics as an add-on or replacement (usually due to adverse events) for other modes of treatment.

We are to advise our patients that long-term opioid therapy is not indicated for certain medical conditions, including headaches, headache disorders, and axial low back pain, but if we are at the point of prescribing opioids to a patient in chronic pain then usually everything else has failed.

I have patients with chronic headaches where neurologists have prescribed narcotics because nothing else works. I have patients who have had benzodiazepines added to their narcotic regimen by neurologists and pain clinics so that they can get some sleep. Patients who are nonsurgical candidates for chronic back pain often suffer until opioids are prescribed.

When did it become gospel that patients with a history of addictions or those with psychiatric illness or young people, whoever that applies to, can't suffer severe pain? I attended a medical conference years ago when a well-respected clinical pharmacologist asked, "Would you rather have a patient in chronic pain suffer, be bedridden, and/or housebound, and not be on narcotics, or be adequately treated and be a productive member of society working, enjoying his/her quality of life, and paying taxes, albeit needing narcotics to do so?" I thought about what he said and changed my whole attitude on treating chronic noncancer pain and have never regretted it.

Yes, patients become dependent on narcotics, but there is a difference between dependence and addiction. We have patients who are dependent on antihypertensive medications, on thyroid medications, on diabetic medications, and the list goes on. We also have patients dependent on narcotics and if that's what it takes for them to have some quality of life and function normally, or as close to normally as possible, then I am all in favor of prescribing narcotics.

I have no problems with the Col-

lege's new standards, but what do they recommend I treat my chronic pain patients with? Many cannot tolerate nonsteroidal antiinflammatory drugs (NSAIDs). (It is said more people die from NSAIDS in Canada than all of the traffic accidents combined.) NSAIDS are contraindicated in so many situations—chronic kidney disease, heart problems, gastrointestinal bleeds, etc. Tylenol is minimally effective, if at all, in patients with anything more than mild pain, especially in the geriatric population.

We send our difficult patients to pain clinics, and after a prolonged wait for usually minimal benefit, rarely, if ever, do they suggest to taper or stop opioids.

Studies have shown it to be safe to drive, etc., in those with steady-state narcotic administration. I will gladly stop prescribing opioids for chronic pain, but tell me what should I prescribe?

My prescribing habits can easily be monitored through PharmaNet and the duplicate prescription program. Those who are prescribing out of range can be audited and disciplined if they can't justify their prescribing, but leave the rest of us alone to care as best we can for our patients in pain.

Not all patients are con artists or junkies. Not all doctors are inappropriate prescribers. We care about our patients and hate to see them suffer but our options are limited.

I have yet to have a specialist in pain, surgery, physiatry, internal medicine, etc., suggest I stop narcotic prescribing for appropriate indications, and I have been practising for a long time.

Give me readily accessible, workable alternatives to narcotics when all else fails or leave me alone!

—Stephen M. Shore, MD, CCFP
Langley

College replies (1)

The College fully appreciates the difficulty in treating patients with medical conditions or symptomatology for which an effective treatment cannot be found, or for which the patient is unable to pay.

Safe Prescribing of Drugs with Potential for Misuse/Diversion was developed over the past year because the previous document, entitled *Prescribing Principles*, failed to prevent an increasing toll of prescription drug misuse and overdose deaths in this province. Additionally, clinical guidelines developed by NOUGG in 2010, an initiative sponsored by this and other Canadian medical regulatory authorities, have also apparently not been effective in preventing the increasing reliance of prescribers on long-term opioid treatment for chronic noncancer pain.

There is an excellent summary of the current medical evidence and expert opinion in the US Centers for Disease Control and Prevention's *Guidelines for Prescribing Opioids for Chronic Pain*. The conclusion of the experts is that opioid treatment for chronic pain provides small to moderate short-term benefits, uncertain long-term benefits, and potential for serious harm.

While there is limited evidence of the long-term benefits of non-opioid therapies, the risk of harm is clearly far less and thus they should be considered preferred treatments. Nonpharmacologic therapies can include exercise and physical therapies as well as psychological therapy such as cognitive behavioral therapy. Not all of these approaches have to be in the context of multidisciplinary programs, which many patients are unable to afford.

The College's statutory mandate is public protection, and the purpose of this professional standard is to reduce inappropriate prescribing of certain classes of medications. The College cannot address all of the societal problems that make the treatment of patients with chronic noncancer pain so challenging; however, it can try to reduce the additional harm that is caused by unsafe pharmacotherapy.

—Gerrard A. Vaughan, MD
President, College of Physicians and Surgeons of British Columbia
—Heidi M. Oetter, MD
Registrar and CEO, College of Physicians and Surgeons of British Columbia

Safe prescribing (2)

In an unprecedented move, the College of Physicians and Surgeons of BC (CPSBC) introduced the professional standards and guidelines *Safe Prescribing of Drugs with Potential for Misuse/Diversion* as a legally enforceable policy on 1 June 2016.

The standard extends the US Centers for Disease Control and Prevention's (CDC) *Guideline for Prescribing Opioids for Chronic Pain* to include stimulants and sedatives.

The CPSBC gave no reasons for rejecting the evidence-based Canadian *Guideline for Safe and Effective Use of Opioids for Chronic Non-Cancer Pain* or adopting the CDC guideline as a standard.

The CPSBC did not consult the Pain Medicine Physicians of BC Society (PMPoBC) or Pain BC, the key organizations representing physicians with focused pain practices and the one in five British Columbians living with persistent pain.

The PMPoBC wants to minimize harm from drugs we prescribe. However, we are very concerned that enforcing the standard will diminish quality of life in the majority of patients who do not misuse, divert, or become addicted to opioids, sedative, or stimulants. The CPSBC appears to accept this consequence.

The PMPoBC is very concerned that, given the lack of access to interdisciplinary pain clinics and community-based physical and psychological therapies, some patients will seek illicit drugs to relieve their conditions which will further escalate

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the current public health emergency. We also hope that physicians do not withdraw from managing persistent pain because of mandated restrictions to their practices.

The PMPoBC has written to the CPSBC seeking clarification of many statements in the standard, including those mandating maximum daily doses of opioid and prohibiting trials of opioids in certain conditions, including many psychiatric disorders. We have offered to help the CPSBC revise their standard. We await their response.

—Owen D Williamson, MBBC, FRSCS, FFPMANZCA
President, Pain Medicine Physicians of BC Society

College replies (2)

The development of this or any other professional standard is not "unprecedented." The College has a statutory obligation to set standards for medical practice, and most elements contained in the standard on safe prescribing have appeared in successive versions developed by the College's Prescription Review Program entitled Prescribing Principles. The College has been using the prescribing principles in its work with registrants for more than 3 years. Hundreds of BC physicians have successfully operationalized them in their practices—by that measure, they are extensively field tested in real-life clinical settings.

With respect to strong opioids for chronic noncancer pain, successive, authoritative systematic reviews by Furlan,[1] Ballantyne,[2] Chou,[3] and colleagues suggest that, on average, there is weak evidence of modest relief of pain for a period of weeks or a few months, with minimal functional improvement, not superior to naproxen or nortriptyline. Dr Chou's recent paper in the *Annals of Internal Medicine* documents accumulating epidemiological evidence of harms, including addiction and death. This is not to say that some patients do not benefit from long-term opioid therapy, only that the benefit is very modest, the risks significant, and the evidence tentative, despite over 20 years of escalating prescribing.

While the College participates in a consultative process during the development of professional standards, it cannot and must not abrogate its legal obligation to regulate medical practice, including prescribing. Regulation is foundational, and the advice in the standard is deliberately formulated in general terms, allowing flexibility for bedside clinical judgment. Nothing in the standard prohibits or even materially interferes with the ability of pain specialists or other physicians to safely and effectively care for their patients.

The College shares concerns that services for patients who suffer from chronic pain are often difficult to access or navigate. Solutions to that are beyond the mandate of the regulator. What is within the College's mandate is the ability to investigate any report of physicians misapplying the standard to the detriment of patients.

—Gerrard A. Vaughan, MD
President, College of Physicians and Surgeons of British Columbia
—Heidi M. Oetter, MD
Registrar and CEO, College of Physicians and Surgeons of British Columbia

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Safe prescribing (3)

The Section of Psychiatry is both disappointed with and concerned about the new professional standards and guidelines for *Safe Prescribing of Drugs with Potential for Misuse/Diversion* put into effect by the College of Physicians and Surgeons of BC on 1 June 2016. We believe that the release of this document reflects a striking failure of due diligence, and a major misstep in the College's fiduciary duty to guard public safety.

By codifying so many complex clinical decisions as standards instead of guidelines, the College has intruded into the doctor-patient relationship in an unprecedented fashion. Limiting opioid dosing to an absolute, no-exceptions maximum of 90 mg of morphine equivalent per day is one such example. In clinical practice, patients' requirements, physiologies, conditions, and options/alternatives are often highly divergent. Protection for patients on stable, responsible, enduring, and successful opioid treatment regimens that happen to be in excess of this arbitrary figure—and there are many—is lacking in this document.

That the College does not explicitly make an exception for active cancer, palliative, and end-of-life patients is an unconscionable oversight that requires formal revision immediately.

Our biggest concern is the College's failure to account for the welfare of the many British Columbians suffering from chronic mental illness. The idea that someone who needs a benzodiazepine for treatment of a complex sleep disorder, or a psychostimulant for severe ADHD, now does not have the option of receiving basic ongoing opioid pain control medication if needed—unlike every other patient in the province—is frankly discriminatory. By failing to clearly define "sedatives," "stimulants," and "psychoactive medications," and by painting such treatments with the same brush used for Schedule I drugs, the College further stigmatizes the mentally ill.

The Section of Psychiatry is extremely supportive of well-considered and effective strategies and initiatives that aim to reduce the risk of harm to the public. This document, clearly produced without meaningful input from psychiatrists, will leave physicians in certain cases facing the dilemma of either disregarding standards published by their regulatory body, or compromising patient care. We object.

—Steve Wiseman, MD
Chair, Economics Committee,
BC Psychiatric Association
—Carol-Ann Saari, MD
President, BC Psychiatric Association

College replies (3)

Safe Prescribing of Drugs with Potential for Misuse/Diversion was developed over the past year as an evolution to a previous document entitled *Prescribing Principles*, which failed to prevent an increasing toll of prescription drug misuse and overdose deaths in this province. The decision to reframe what is essentially the same advice as a standard rather than a guideline was based on what the College saw as a need to provide more authoritative direction to the profession in the context of Dr Perry Kendall's recent description of BC's health care emergency of opioid misuse and overdose.

The authors write that the professional standard does not explicitly make an exception for active cancer, palliative, and end-of-life patients. In fact it does, but perhaps greater clarity or emphasis on this point would be helpful when the standard is next reviewed.

The College does not accept that the professional standard in any way fails to account for the welfare of patients with mental illness or contributes to the stigmatization of these patients. A large part of the impetus to provide more authoritative direction for safe prescribing was evidence before the College—that it is often patients with concurrent diagnoses of mental illness or addiction who are the victims of the adverse and sometimes fatal side effects of inappropriate long-term opioid treatment.

—Gerrard A. Vaughan, MD
President, College of Physicians and Surgeons of British Columbia
—Heidi M. Oetter, MD
Registrar and CEO,
College of Physicians and Surgeons of British Columbia

EHRs and burnout (a.k.a. early retirement)

A recent article in the *Globe and Mail*, included in a Doctors of BC newsflash, led me to write about electronic health records (www.theglobeandmail.com/life/health-and-fitness/health/doctors-using-electronic-records-at-higher-risk-for-burnout-study/article30652673/).

EHR adoption has not included provisions for transcription of pre-existing records/history. EHRs have been a boon for the regional health authorities in British Columbia—gathering of big data to allow further simplification of complex realities and ultimately leading to more homogenization and standardization of our (ideally) complex relationships with real people (patients) on the ground. Bonus incentives for management that are modelled on the corporate sphere make the mining of big data without a thorough understanding of the front-line complexities dangerous. With an agenda to make it easier to have the appearance of accountability and standardization of care, the data are often used to justify reduced real services on the ground and increased micromanagement.

I would hypothesize that in family medicine, burnout leads to a decreased ability to be our patients' advocates in navigating the idiosyncrasies of non-transparently rationed care, less face

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time with patients, and more errors, thus justifying a need for more quality assurance and more idiot-proofing built into the EHRs, followed by a need for constant improvements (i.e., not intuitive patches that are usually inconsistent with the original operating platform), and resulting in EHRs that are even more rigid and frustrating. It's a positive feedback loop and more business for the IT industry. The apparent smartness of drop-down menus and rigid algorithms have reduced flexibility and fit, as well as satisfaction and connection, which are essential in family medicine. Many of us may retire earlier than we otherwise would have, not because we don't get it and are too rigid to learn, but rather because we do.

—Andre C. Piver, MD
Nelson

Re: The impact of excessive endurance exercise

First, thank you for a very important and well-written article [*BCMJ* 2016;58:203-209].

I took a look at the four recent studies that were discussed in the "How much exercise is enough?" section and wonder if you can shed light on something. The clearest U-curve is found in the study on Copenhagen joggers.[1,2] The study on runners in Texas[3] also showed a U curve though it was less striking. The study on all forms of exercise in Taiwan,[4] however, showed a continued benefit with longer and more vigorous exercise.

The main differences in these studies that I found were:

1. Difference in race: East Asian versus two white populations.
2. Difference in exercise modality: running versus all forms.
3. Difference in follow-up period: The study in Taiwan was only 8 years of follow-up, which is less than in Copenhagen or Texas, though the subgroup analysis in Copenhagen[2] was also around this length and showed a marked U-curve.

I didn't see any obvious differences in other subject characteristics, though I may have missed something.

Are there any other studies suggesting differences in exercise benefits among different races or exercise modalities?

Thanks again for a stimulating article!

—Joel Fox, MD (PGY-1 Psychiatry)
Vancouver

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Authors reply

We would like to thank Dr Fox for his comments. The studies mentioned are population cohort studies looking at a wide range of individuals with varying activity and fitness levels. The Taiwan study[1] attempted to define the minimal amount of exercise required and looked at all comers in a standard medical screening program. They did demonstrate that higher levels of moderate or vigorous activity conferred no additional health benefits and, thus, more of a reverse J-shaped curve than a U-shaped curve. Given the scope of this review, which focused on excessive endurance exercise, we have focused on those at the extreme end of these mortality curves. The other related articles in the April and May issues of the *BCMJ* may provide more insight into the specific benefits of exercise, since it is clear that moderate exercise is beneficial. The specific studies mentioned are all observational studies with inherent limitations. There are other similar studies not included in the scope of the review that demonstrate similar U-shaped curves or reverse J-shaped curves, but there appears to be a consistent signal that further benefit and potential harm may lie at the extreme end of exercise. To our knowledge, there are no randomized studies that directly compare differences in exercise modality on cardiovascular morbidity or mortality. Overall, our take-home message is that we know moderate and even high levels of exercise appear to show benefit, but the upper limit at which adverse cardiac effects occur is not known.

—Andrea K.Y. Lee, MD
—Andrew D. Krahn, MD

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Congenital heart disease: Complexities and considerations

Dr Jasmine Grewal

Dr Marla Kiess

This article has been peer reviewed.

During normal fetal circulation the fetus receives oxygen directly from the mother through the placenta. Blood enters the fetus's right atrium, and about two-thirds of it then flows through the foramen ovale into the left atrium, bypassing the lungs. Blood from the left atrium passes into the left ventricle and on to the aorta. The remainder of blood from the right atrium flows through the pulmonary artery and is shunted away from the lungs to the aorta through the ductus arteriosus. Blood from the aorta then enters the umbilical arteries and flows into the placenta and is oxygenated. The oxygenated blood flows back through the umbilical cord to the liver, is bypassed through the ductus venosus into the inferior vena cava, and arrives in the right atrium of the heart. At birth the umbilical cord is clamped and the baby no longer receives oxygen from the mother. With the first breaths the lungs begin to expand and the ductus arteriosus and the foramen ovale both close.

The heart is completely formed by 8 weeks of gestation, but if problems occur during the crucial steps of cardiac development congenital heart disease (CHD) can result. The incidence of CHD Canada-wide is estimated to be 12 to 14 cases per 1000 live births[1] and includes a spectrum of abnormalities, from minor narrowing of a blood vessel to malformation of one or more cardiac valves and chambers.

Since the introduction of cardiac surgery and the first successful ligation of a patent ductus arteriosus in the 1930s, the care of patients with CHD has been characterized by dramatic progress and widespread optimism. Historically, most patients with CHD died in infancy or childhood. In the past 4 decades, however, advances in medical care, surgery, and interventional cardiology have changed this poor prognosis, and today over 90% of patients with CHD reach adulthood.

Analysis of administrative data from Quebec indicates that in the year 2000 there was a prevalence rate of 4.09 cases per 1000 adults for all CHD and 0.38 cases per 1000 adults for severe lesions,[2] and that an equal number of adults and children were affected by CHD. Since 2000 the number of adults with CHD has grown to exceed the number of children with CHD. The prevalence of severe CHD in adults increased by 85% from 1985 to 2000 and by 55% from 2000 to 2010, consistent with the concept that the greatest survival benefit has occurred in those with more severe forms of CHD.[2] In 2010, adults represented 66% of the entire CHD population.

One result of the successful treatment of children with CHD is an increasing number of medically complex adult CHD patients who live with uncertainty regarding complications and prognosis. Few of these patients

have been cured and most have been left with residual defects or abnormalities that will lead to problems later in life (e.g., valvular dysfunction, stenosis in previously implanted conduits, ventricular dysfunction, arrhythmias, heart failure, pulmonary hypertension, thromboembolism, complications associated with pregnancy). Issues unique to adults with CHD include long-term and multisystemic effects of single-ventricle physiology, cyanosis, systemically positioned right ventricles, complex intracardiac baffles, and complex arrhythmias. Acquired heart diseases such as hypertension and coronary artery disease may have a significant negative impact on patients with delicately balanced circulation. Even simple procedures may pose additional risk in some patients (e.g., insertion of a jugular line in a patient with intracardiac baffles can result in puncture of the baffle and death). The majority of these patients will require lifelong cardiac-focused medical care and repeat cardiac surgery or interventional procedures. As well, a number of these patients will be developmentally delayed, have learning difficulties, and/or psychological, social, and financial difficulties that present barriers to proactive health management. Many of these patients will require genetic counseling, reproductive counseling, advice about insurability, and guidance regarding appropriate leisure activities, employment restrictions, and career choices.

The majority of adult CHD patients should be seen at least once by an adult CHD specialist to determine the most appropriate care, and certainly patients with moderate to severe disease merit ongoing follow-up by an expert multidisciplinary team dedicated to the care of adults with CHD. There is strong evidence to show that referral to and management by such a team decreases morbidity and mortality in this complex patient population.[3]

At some time in their medical careers, most physicians in BC will encounter patients who have CHD.

At some time in their medical careers, most physicians in BC will encounter patients who have CHD. Physicians are often at a loss when dealing with these medically complex patients and can benefit from knowing more about common issues and available resources.

In this theme issue we attempt to bridge some knowledge gaps with four articles by adult congenital heart disease experts from the Pacific Adult Congenital Heart Disease program based at St. Paul's Hospital in Vancouver. The first article, by Dr Marla Kiess, provides some historical context and reviews the current state of care for adults with CHD in BC. The second article, by Drs Andrew Campbell and Ronald Carere, describes current surgical and noninvasive interventions for managing adult patients with CHD.

In the third article, Dr Jasmine Grewal and colleagues consider specific medical issues in adult CHD patients related to pregnancy, pulmonary hypertension, and arrhythmias. Finally, in the fourth article, Ms Karen LeComte and colleagues discuss the need to ensure a successful transition and transfer when a patient moves from pediatric to adult care.

The goal of these articles is not to outline specific management principles, but rather to highlight some complexities and considerations faced by these patients so that physicians can make appropriate referrals and provide better care for adults with congenital heart disease.

—Jasmine Grewal, MD, FRCPC
Director, Cardiac Obstetrics Program, Cardiologist, Pacific Adult Congenital Heart (PACH) clinic, Division of Cardiology, St. Paul's Hospital
—Marla Kiess, MD, FRCPC
Director, Pacific Adult Congenital Heart Clinic, Division of Cardiology, St. Paul's Hospital

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Marla Kiess, MD, FRCPC

History and evolution of the treatment of adult congenital heart disease

Surgical developments and other advances mean that more congenital heart disease patients are reaching adulthood and requiring the support of a team that includes cardiologists, nurses, psychologists, and social workers with knowledge of adult CHD.

ABSTRACT: Cardiology experts around the world, including many Canadians, have contributed to dramatic surgical, interventional, and diagnostic advances since the 1930s. These developments began when Dr Helen Taussig established the pediatric cardiology clinic at Johns Hopkins Hospital in Baltimore in 1930 and Dr Maude Abbott of Montreal published the *Atlas of Congenital Heart Disease* in 1936. The first surgical procedure was ligation of a patent ductus arteriosus performed by Dr Robert Gross at the Children's Hospital in Boston in 1938. Intracardiac repair first became possible with the development of cardiopulmonary bypass technology in the 1950s, followed in the 1970s by the development of deep hypothermia with circulatory arrest, which made lengthier surgeries possible. Interventional techniques went hand in hand with surgical advances. Balloon dilatation of the pulmonary valve was first described in the 1950s and became widely used after static balloon dilatation was introduced in 1982. Balloon atrial septostomy was developed in 1966 to promote mixing at the atrial level and dramatically improved the outcome for newborns with complete transposition of the great arteries. Beginning with innovative use of X-ray imaging, diagnostic techniques supported both surgical and nonsurgical interventions. Right heart catheterization became available in the late 1940s and left heart catheterization was developed in the 1950s. The advent of two-dimensional echocardiography in the 1970s permitted a major step forward in the treatment of congenital heart disease (CHD), as did the establishment of standardized nomenclature. Canadian doctor Wilfred Bigelow determined how to use total body hypothermia for open heart surgery in 1953, and the first open heart procedure in Canada was performed by Dr John Callaghan in Edmonton in 1954. In British Columbia, Dr Ross Robertson performed a Blalock-Taussig shunt, closed a patent ductus arteriosus, and repaired a coarctation of the aorta at Vancouver General Hospital in 1947. In the late 1950s Dr Harold Rice built the first cardiopulmonary bypass machine used at St. Paul's Hospital. Because of the many advances made since the 1930s, children born with CHD today are much more likely to grow to adulthood, but they are also likely to require multiple operations for scarring and narrowing of arteries or veins and insertion or replacement of conduits and valves. Patients with moderate to severe disease are rarely cured and face a lifetime of repeat surgical and interventional procedures. Each year, BC Children's Hospital registers approximately 500 newly diagnosed CHD patients and moves 300 previously diagnosed patients from pediatric to adult care. Approximately 150 patients per year will require follow-up in an adult CHD clinic. A review of advances in the treatment of CHD reveals dramatic progress beginning in the 1930s and continuing to the present. Cardiology experts around the world, including many Canadians, have contributed to a variety of surgical, interventional, and diagnostic developments.

This article has been peer reviewed.

Dr Kiess is director of the Pacific Adult Congenital Heart (PACH) clinic, Division of Cardiology, St. Paul's Hospital. She is also a clinical professor in the Division of Cardiology at the University of British Columbia.

Surgical developments

The organized study of congenital heart disease (CDH) began with the establishment of Dr Helen Taussig's pediatric cardiology clinic at Johns Hopkins Hospital in Baltimore in 1930[1] and the publication of Dr Maude Abbott's incredible atlas describing 1000 CHD cases in 1936.[2] The first surgical procedure was ligation of a patent ductus arteriosus (PDA) performed by Dr Robert Gross at the Children's Hospital in Boston in 1938.[3] Dr Taussig had observed that some children became progressively more cyanotic with spontaneous closure of the ductus arteriosus and proposed using an arterial to pulmonary artery shunt. She convinced Dr Alfred Blalock of the merit of this idea and eventually Blalock collaborated with his technician, Vivien Thomas, to construct a shunt from the right subclavian artery to the right pulmonary artery in a cyanotic child. A report on the procedure was published in 1945.[4] Also in 1945, Drs Crafoord and Nylin of Stockholm performed surgery on a patient with coarctation of the aorta.[5] In 1948, Sir Russell Brock, working in Guy's Hospital in London, England, published a report describing three cases of pulmonary stenosis that were repaired with pulmonary valvotomy.[6] In 1950, Drs Blalock and Hanlon performed atrial septectomy using a surgical clamp devised by Vivien Thomas.[7] With the development of cardiopulmonary bypass technology, intracardiac repair became possible. The first procedure done with the use of a heart-lung machine was for closure of an atrial septal defect and was performed by Dr Gibbon in Philadelphia in 1953.[8] Later that year, Dr Lillehei, working in Minneapolis, performed open heart surgery using cross-circulation between the child and a parent. This procedure was found to have a high mortality rate, which led Lillehei and his colleagues to develop a pump oxygenator.[9] However, even with this innovation the preservation of blood flow to the brain was not always optimal and surgeons had to work quickly until the development of deep hypothermia with circulatory arrest in the early 1970s made lengthier surgeries possible.

Canadians have been at the forefront of improvements for patients with congenital heart disease.

Interventional and diagnostic techniques

Interventional techniques went hand in hand with surgical advances. Although balloon dilatation of the pulmonary valve was described in 1953 by Rubio-Alvarez and colleagues,[10] the procedure did not become widely used until Kan and colleagues[11] introduced static balloon dilatation in 1982. Balloon atrial septostomy, developed in 1966 by Drs Rashkind and Miller,[12] promoted mixing at the atrial level and dramatically improved the outcome for newborns with complete transposition of the great arteries. There was an explosion of catheter-based therapies in the 1980s, including balloon dilatation for repair of coarctation of the aorta and stenotic valves, shunts, and conduits. The development of stents vastly improved long-term results. Various devices became available to address fistulae, patent ductus arteriosus, and atrial septal defects. A major advance was the development of prosthetic pulmonary valves by Dr Bonhoeffer[13] and prosthetic aortic valves by Drs Cribier[14] and Webb[15] in the 2000s.

Diagnostic techniques, beginning with Dr Taussig's innovative use of X-ray imaging, supported both surgical and nonsurgical interventions. Right heart catheterization became available in the late 1940s and left heart catheterization was developed in the 1950s. M-mode echocardiograms, first available in the 1960s, were helpful, but it was the advent of two-dimensional echocardiography in the 1970s that permitted a major step forward. Important advances in pathology included the establishment of standardized nomenclature by Richard and Stella Van Praagh working in Toronto, Chicago, and then Boston, and by Robert Anderson, working in London, England.

Canadian contributions

Canadians have been at the forefront of improvements for patients with congenital heart disease, beginning with Dr Maude Abbott of Montreal, who wrote the *Atlas of Congenital Heart Disease* already mentioned. Dr Wilfred Bigelow[16] of the Toronto

General Hospital determined how to use total body hypothermia for open heart surgery in 1953. The first open heart procedures in Canada were for closure of an atrial septal defect and a ventricular septal defect and were performed by Dr John Callaghan in Edmonton in 1954. Dr William Mustard at the Hospital for Sick Children in Toronto significantly advanced the care of patients with complete transposition of the great arteries with his atrial switch operation (Mustard procedure) in 1963.[17]

In British Columbia, Dr Ross Robertson performed a Blalock-Taussig shunt, closed a patent ductus arteriosus, and repaired a coarctation of the aorta at Vancouver General Hospital in 1947. Dr Jack Stenstrom started performing PDA ligations and Blalock-Taussig shunts in Victoria in 1949. In 1957, Dr Peter Allen, with the assistance of Drs Phil Ashmore, Bill Trapp, and Ross Robertson, performed the first open heart procedure at Vancouver General Hospital, closing an atrial septal defect in a 9-year-old boy.[18] In the late 1950s, Dr Harold Rice built the first cardiopulmonary bypass machine used at St. Paul's Hospital.[19] He had a very personal reason for wanting to do this: his wife, Dorothy, was born with an atrial septal defect, and in 1953 she was the fourth patient in the world and the first patient at the Mayo Clinic to have open heart surgery under hypothermic cardiac arrest. An anomalous pulmonary vein discovered at surgery could not be repaired until the advent of cardiopulmonary bypass, and she had a second procedure in 1958 at the Mayo Clinic when she was in her late forties. Drs Bob Gourlay, Ted Musgrove, and Gerry Coursley closed an atrial septal defect in a 12-year-old girl using Dr Rice's machine at St. Paul's Hospital in 1960. Cardiac catheterization was first performed at Vancouver General Hospital by Drs Morris Young and Dennis Vince, starting in the mid-1950s. Dr Doris Kavanagh performed the first cardiac catheterization at St. Paul's Hospital in 1959. The need for this procedure was great. After her first successful study, Dr Kavanagh was asked by Dr Young if she could catheterize some of his patients and he sent her a list of 400 patients who had been waiting for as long as 4 years.

In the early days of cardiac surgery, intracardiac repairs could only be performed on older children.

Further developments

In the early days of cardiac surgery, intracardiac repairs could only be performed on older children. Congenital heart lesions frequently resulted in too much or too little blood flow to the lungs. Infants and young children with reduced blood flow to the lungs were palliated with arterial shunts, either Blalock-Taussig (subclavian artery to pulmonary artery), Potts (descending aorta to pulmonary artery), or Waterston (ascending aorta to pulmonary artery), and those with excess blood flow to the lungs were palliated with pulmonary artery banding. The flow through these arterial shunts was difficult to control and pulmonary hypertension was a significant risk. Dr Glenn felt that venous shunts would be superior, anastomosing the superior vena cava to the pulmonary artery in 1959.[20] Many patients had repeat operations with ligation of arterial shunts and replacement with right and/or left Glenn shunts. When the child patient reached an adequate size, usually around age 4, intracardiac repair was performed, the shunts were ligated, or the pulmonary band was removed. Dr Fontan developed total right heart bypass for patients with single-ventricle physiology in 1971[21] and subsequent modifications to improve hemodynamics were developed by him and Dr de Leval.[22] In the early 1980s, Dr Aldo Castenada perfected neonatal repairs at the Boston Children's Hospital.[23]

Adult congenital heart disease care in BC

As in the past, many children born with congenital heart disease today will require multiple operations as they grow to adulthood for various reasons, including scarring and narrowing of arteries or veins and insertion or replacement of conduits and valves. Patients with moderate to severe disease are rarely cured and face a lifetime of repeat surgical and interventional procedures.

Based on a Canada-wide incidence rate of 12 to 14 cases per 1000 live births,[24] 500 to 600 infants with CHD are born per year in British Columbia. Data suggest that as of 2010 over 24 000 individuals with CHD born in BC had survived to adulthood. Some of these adults have simple defects and have little need for medical care. However, over 12 000 adults have moderate to severe defects and will require lifelong care by an array of health professionals with expertise in the field of CHD.

BC Children's Hospital currently registers approximately 500 newly diagnosed patients with CHD every year and moves 300 patients from pediatric to adult care each year. Approximately 50% of these patients, or 150 per year, will have moderate to severe CHD and require follow-up in an adult CHD clinic. These patients need ongoing evaluation to determine whether they require further intervention or medical management. About 110 of these patients (60%) can be expected to require specialized continuing care for optimal quality of life. A smaller but significant number of individuals present later in childhood or early adulthood with congenital defects that have gone undetected due to the sometimes insidious nature of CHD progression, and like patients with known CHD, these newly diagnosed patients may need advice regarding pregnancy risks and cardiac surgery options.

The range of abnormalities, the complexities of postoperative anatomy, and the challenges of multisystem involvement mean a full understanding of CHD is now well beyond the education and experience of the typical cardiologist caring for adult patients. To care for these patients, practitioners require knowledge and training in congenital heart disease, adult cardiology, and general medicine, and the support and expertise of a multidisciplinary team (nurses, psychologists, social workers) who have knowledge of CHD.

A recent study from Quebec has shown that these complex patients have higher rates of hospitalization, more visits to emergency rooms, greater use of outpatient cardiologist care, and more days in critical care.[25] The Canadian Cardiovascular Society,[26] American College of Cardiology,[27] and European Society of Cardiology[28] have all recognized the urgent need for trained medical staff, allied health personnel, and specialized clinics to deliver appropriate care to this rapidly growing population of adults with CHD.

Summary

Many advances have followed the first successful ligation of a patent ductus arteriosus in 1938. Intracardiac repair became possible with the development of cardiopulmonary bypass technology in the 1950s, while lengthier surgeries became possible after the development of deep hypothermia with circulatory arrest in the 1970s. Interventional techniques have accompanied surgical advances, and a variety of imaging innovations have supported the development of both surgical and nonsurgical interventions. The many advances made since the 1930s mean that children born with CHD today are much more likely to grow to adulthood. However, they are also likely to require multiple operations for scarring and narrowing of arteries or veins and insertion or replacement of conduits and valves, and to require the support and expertise of a multidisciplinary team with knowledge of CHD.

BC Children's Hospital currently registers approximately 500 newly diagnosed patients with CHD every year and moves 300 patients from pediatric to adult care each year.

Competing interests

None declared.

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Surgical and interventional management of adult congenital heart disease

A growing population of patients with adult CHD is being helped today by rapidly developing surgical techniques and catheter-based technologies.

ABSTRACT: Survival of pediatric patients after surgery for congenital heart disease has consistently improved over the past 2 decades. As a consequence, more young adults are presenting with both historical and contemporary repairs, and with both anticipated and completely unanticipated complications. Surgery for adult congenital heart disease continues to evolve in Canada, and even the recent rapid progress in percutaneous and hybrid approaches to congenital heart disease has had no impact on the volume or the complexity of surgical cases. Technological advances now permit the treatment of both relatively simple and very complex anatomical and pathophysiological problems using percutaneous techniques. Managing adult congenital heart disease patients now means choosing from the surgical and interventional options available and determining which cases will truly benefit from novel therapies and which will require only what has always been done. We will continue to need well-integrated congenital heart disease programs that permit collaboration between adult and pediatric medical and surgical subspecialists.

This article has been peer reviewed.

Over the past 2 decades the survival of pediatric patients after surgery for congenital heart disease (CHD) has consistently improved, with in-hospital mortality rates now routinely below 3%. With this advance more children are now surviving and presenting as young adults with both historical and more contemporary repairs and therefore with both anticipated and completely unanticipated complications. This means we must look at the different levels of complexity of adult CHD and the array of surgical and interventional options, and determine which cases will truly benefit from novel therapies and which will require only what has always been done.

Surgical management

Modern surgical management of congenital heart disease began on 26 August 1938 with the first documented successful ligation of a patent ductus arteriosus (PDA) in a 7-year-old patient by Dr Robert Gross in Boston.[1] The operation was scheduled while surgeon-in-chief Dr William Ladd was on vacation for fear that Ladd would not allow the groundbreaking surgery to go ahead. Later this led to an irreparable rift between the two surgeons, despite confirming that native defects of the heart and great vessels were amenable to surgical repair.

As Dr Gross stated in his case report, at that time 50% of the children affected by PDA could be expected to die in infancy and the remainder would suffer the consequences of heart failure and, potentially, Eisenmenger syndrome, which would lead to an early death in the third or fourth decade of life. PDA ligation is now performed at the bedside in the neonatal intensive care unit in 30 minutes or less.

Since this beginning, cardiac surgery for congenital defects has made great strides, but at every step there has been tension between the possible benefits of innovation and the risk of causing more harm than existing therapies or the natural history of the disease. This tension was very apparent in the 1980s when therapy for transpo-

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sition of the great arteries underwent a revolution as atrial-level repair was replaced by an arterial-level operation developed principally by Dr Jatene of the University of Sao Paulo. For the first time, the coronary arteries of children were dissected and transposed from the pulmonary root to the neoaorta, a procedure that would have been considered impossible in 1975. After repeated efforts, Jatene and his team developed a programmatic approach to the management of these children; even so, Jatene's review of his first 116 patients revealed an early mortality rate of almost 21%, with only 33% of surviving patients having normal function and a good anatomic repair.[2] Over this same period, centres experienced with atrial-level repairs achieved early mortality rates of 2% to 3%. However, 25 years later it appears that the long-term benefits of a systemic left ventricle clearly outweigh the risks of a more complex neonatal operation as these children have grown into adults with improved survival and better exercise tolerance.[3] Thus the challenge for management of congenital heart disease remains: How do you decide which procedure is safest when one of the procedures is novel and the disease process is unknown?

The different forms of adult congenital heart disease requiring management (**Table**) can be grouped as follows:

- Category 1. Previously undiagnosed pediatric disease that presents in adulthood.
- Category 2. Anticipated residual disease following a pediatric surgical procedure or palliated pathology.
- Category 3. Unanticipated deterioration following a pediatric surgical procedure or palliated pathology.

Understandably, most new lesions will initially present as category 3 disease. Once several patients with similar anatomy are identified, what was initially thought of as unanticipated becomes anticipated and a new algorithm for care is developed.

Category 1 disease

The most common category 1 condition leading to surgical referral 15 years ago was ostium secundum atrial septal defect (ASD). Now with the refinement and expansion of catheter-based technologies surgeons see fewer isolated atrial septal defects. Interestingly, the increased scrutiny of patients with atrial septal defects for possible catheter-based closure has identified a large number of patients with associated anomalous pulmonary venous return who cannot undergo catheter-based closure and are therefore referred for more complex surgical repair with venous baffling of the anomalous veins. So despite the large number of ASD cases being managed in the catheterization laboratory, the identification of underdiagnosed patients means the number of surgical cases has actually increased.

Asymptomatic ventricular septal defects are surprisingly common as an incidental echocardiographic finding but few are found to have a significant shunt. Clefts and parachute-morphology mitral valves may present in adulthood with a gradual progression of regurgitation or stenosis and can be occasionally misinterpreted as a more routine anatomy amenable to conventional repair. This can lead to the rare intraoperative consultation for the congenital heart disease surgeon in a colleague's operating room, and heightens the importance of having a well-integrated CHD program with collaboration between adult and pediatric medical and surgical subspecialists.

Category 2 disease

The most common category 2 condition leading to surgical referral remains pulmonary insufficiency associated with tetralogy of Fallot (TOF). Up until the 1980s, the vast majority of surgical repairs for TOF

Table. Forms of adult congenital heart disease requiring management.

	Complexity	Examples	Outcome
Category 1 disease Previously undiagnosed pediatric disease presenting in adulthood	Low	Atrial septal defect, ventricular septal defect, double aortic arch, cleft mitral valve	Good
Category 2 disease Anticipated complications from pediatric repair or palliated pathology	Moderate	Pulmonary insufficiency following repair for tetralolgy of Fallot, mitral regurgitation following repair for atrioventricular septal defect, failure of Fontan repair, systemic right ventricle failure following atrial switch procedure	Varies
Category 3 disease Unanticipated complications from pediatric repair or palliated pathology	High	Neoaortic valve failure following arterial switch, systemic ventricular dysfunction following repair for ALCAPA (anomalous left coronary artery from pulmonary artery)	Unknown

involved a vertical incision crossing the pulmonary valve and rendering it incompetent. Over time the volume load on the right ventricle creates dilatation and eventually a decrease in ventricular function that can lead to symptoms. A great deal of research has been performed to determine the right ventricular volumes above which an adverse surgical outcome can be expected and whether earlier restoration of pulmonary competence will lead to a more rapid return to normal ventricular dimensions. Other considerations include timing of valve implantation, valve type, and the possibility of future percutaneous valve implantation.

Category 3 disease

The most complex and challenging cases for the surgeon involve category 3 disease, as patients in this category generally have survived the most severe forms of pediatric CHD. They often have diminished systemic ventricular function, either due to a right ventricle in the subaortic position or as a consequence of multiple episodes of cardiopulmonary bypass. There is presently little evidence to guide timing or determine the type of repair that is best for these patients.

For patients who have received a classic right atrial to pulmonary anastomosis as the final stage of their single-ventricle palliation, their atrium eventually dilates and becomes an inefficient capacitance chamber for systemic venous drainage, which leads to decreased forward flow into the pulmonary circulation and abdominal congestion. These patients are considered to have a failed or failing Fontan circulation,[4] and as a result are candidates for the more contemporary Fontan repairs that have been developed. Much remains poorly understood about this patient population. Similarly, when patients with a subaortic right ventricle begin to develop ventricular dysfunction, their generally young age and tolerance of cyanosis can mean they tolerate pulmonary edema and diminished cardiac output much better than older ischemic cardiac patients. As single-ventricle anatomy and multiple sternotomies make the prospect of implanting a ventricular assist device daunting, CHD patients with minimal symptoms but severe dysfunction are often overlooked for this therapy and therefore have great difficulty qualifying for cardiac transplantation.[5] Establishment of a separate congenital heart disease transplant list has been discussed in several countries, but does not yet exist in North America.

Surgery for adult congenital heart disease continues to evolve in Canada. Even the recent rapid progress in percutaneous and hybrid approaches to complex heart disease has had no impact on the volume or the complexity of surgical cases seen in our centre. Instead, with an ever-growing population of pediatric CHD patients who will require reintervention in future, we expect to be providing more options for patient management and working to minimize the complexity of procedures that will be needed over time. As the pediatric CHD population continues to age, more late postoperative complications will be recognized and the number of patients with category 3 disease will increase. And as we saw with the work of Dr Gross and Dr Jatene, surgeons will continue to weigh possible benefits against the risk of a new intervention, and in time new surgical treatments will evolve.

Interventional management

Technological advances now allow us to treat both relatively simple and very complex anatomical and pathophysiological problems using percutaneous techniques. Interventions for adult CHD have for some time employed devices and techniques that are referred to as "structural heart disease interventions."[6] These interventions require the operator to have expertise in congenital heart disease and the unique surgeries and connections that many of these patients have had in the past. Broadly speaking, interventions fall into two main categories: those for closing abnormal connections and those for relieving obstructions.

Closing abnormal connections

The primary goal in closing an abnormal connection is to obtain or improve separation of the oxygenated arterial circulation from the deoxygenated venous circulation. Considerations include the effect on symptom status, the vasculature, cardiac chambers, and/or physiology. Closure of connections can also be performed to prevent paradoxical embolization, depending on the clinical scenario and the lesion in question. Small connections that have no significant hemodynamic effect or present little risk for paradoxical embolization are often followed clinically.

Although there are several devices available to close abnormal vascular connections, the most commonly used devices worldwide are occluders manufactured by St. Jude Medical in St. Paul, Minnesota. These devices are made from a deformable nickel and titanium alloy that allows passage through a catheter and rely on a screw-release mechanism that allows the device to be controlled until it is deliberately released (**Figure 1**). Different series are designed specifically for closure of atrial septal defects, patent foramen ovale, patent ductus arteriosus, and vascular connections.

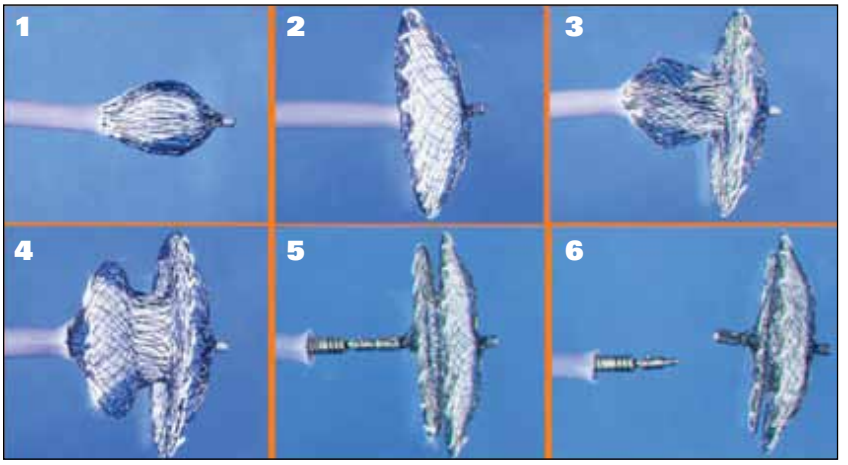

Figure 1. Steps in the deployment of the Amplatzer septal occluder.

Step 1: Delivery sheath is withdrawn to expose left atrial retention disc. **Step 2:** Left atrial disc is fully deployed to prepare for pulling entire mechanism back to atrial septum. **Step 3:** Waist of device (sized to fit defect) is deployed. **Step 4:** Delivery sheath is pulled back to right atrium to begin deployment of right atrial retention disc. **Step 5:** Device is fully deployed, with left and right retention discs positioned on either side of atrial septum, and placement and security of device are checked. **Step 6:** Delivery cable is unscrewed and removed.

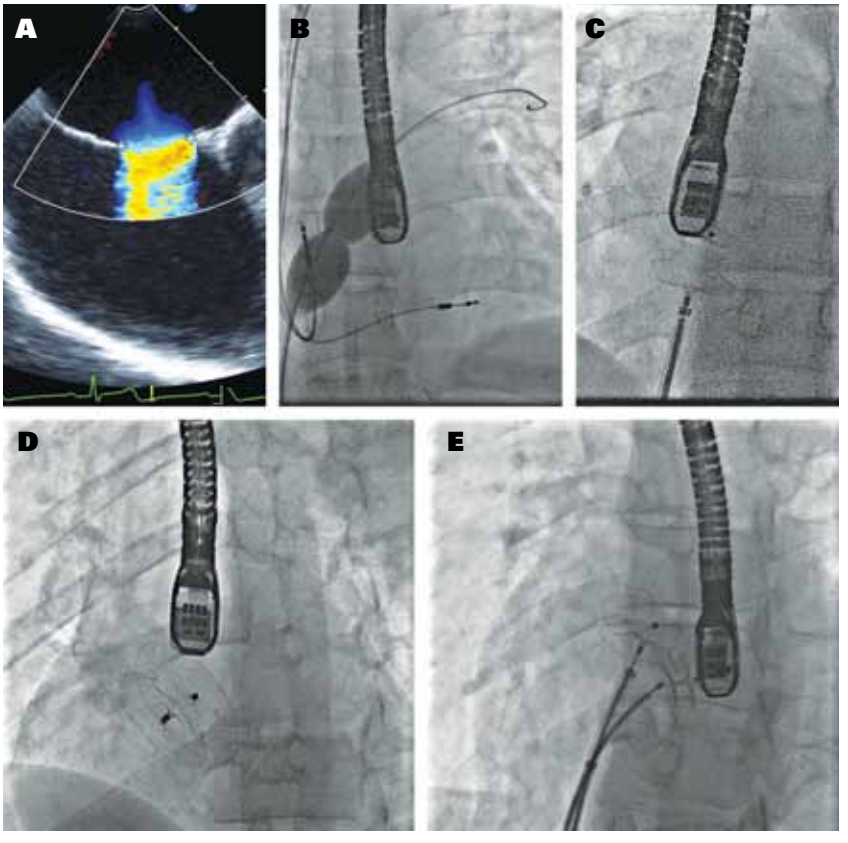

Figure 2. Atrial septal defects

Atrial septal defects. There are various atrial septal defects that can be repaired with closure devices, with the most common being the ostium secundum atrial septal defect. The direction and magnitude of the shunt in an ASD patient is determined by the size of the defect and the relative compliance of the right and left ventricle. The shunt occurs predominantly from the left atrium to the right atrium and can lead to right atrial and right ventricular dilation, arrhythmias, and right-sided heart failure. Although it is rare to develop pulmonary hypertension, if this does occur closure should be undertaken only after careful consideration.

The commonly used Amplatzer atrial septal defect occluders come in sizes ranging from 4 to 40 mm, with retention discs that are 8 to16 mm larger than the waist. All patients are prescreened with a transesophageal echocardiogram (TEE) to confirm there is an adequate rim of atrial septal tissue to safely anchor the closure device and ensure there are no other associated congenital heart defects that would preclude percutaneous closure. After the size of the defect is established using transesophageal or intracardiac echocardiography, the device is positioned and released once the position and stability are confirmed. Although large defects and multiple defects are more challenging

Figure 2. A: Image from a transesophageal echocardiogram (TEE) combined with color doppler ultrasound reveals the size of an atrial septal defect and shows blood flow through the defect from the left atrium (top) to the right atrium. **B:** Sizing balloon is inflated in a defect so that the balloon waist can be measured and the appropriate device size selected. **C:** A 14-mm septal occluder in position with the left atrial disc deployed. **D:** A 34-mm septal occluder in position. **E:** Two devices positioned but not yet released—a septal occluder (higher to left) and a cribriform patent foramen ovale occluder with a narrow waist to close multiple defects.

to correct than small single defects, they can often be closed successfully (Figure 2).[7]

Patent ductus arteriosus. In the developing fetus, the ductus arteriosus between the pulmonary artery and the descending aorta is the connection that enables passage of oxygenated blood from the mother's placenta directly to the systemic circulation. When this fails to close shortly after birth, blood shunts from the aorta to the pulmonary artery. Indications for closure include a significant shunt that affects the left heart chambers or pulmonary pressures. More controversially, closure may also be considered as a way to reduce the long-term risk of endarteritis in the event of systemic bacteremia.

Patent ductus arteriosus comes in a variety of configurations. When small, such defects may be closed with coils, while larger defects may be closed with one of many Amplatzer devices (Figure 3).

Fistulas. Fistulas are connections between vascular structures and can be arteriovenous or venovenous. Fistulas can also occur between a cardiac chamber and vein or artery. Indications for fistula repair include the establishment of hemodynamic significance, deoxygenation, and endocarditis. Closure of a fistula commonly involves a vascular plug (Figure 4).

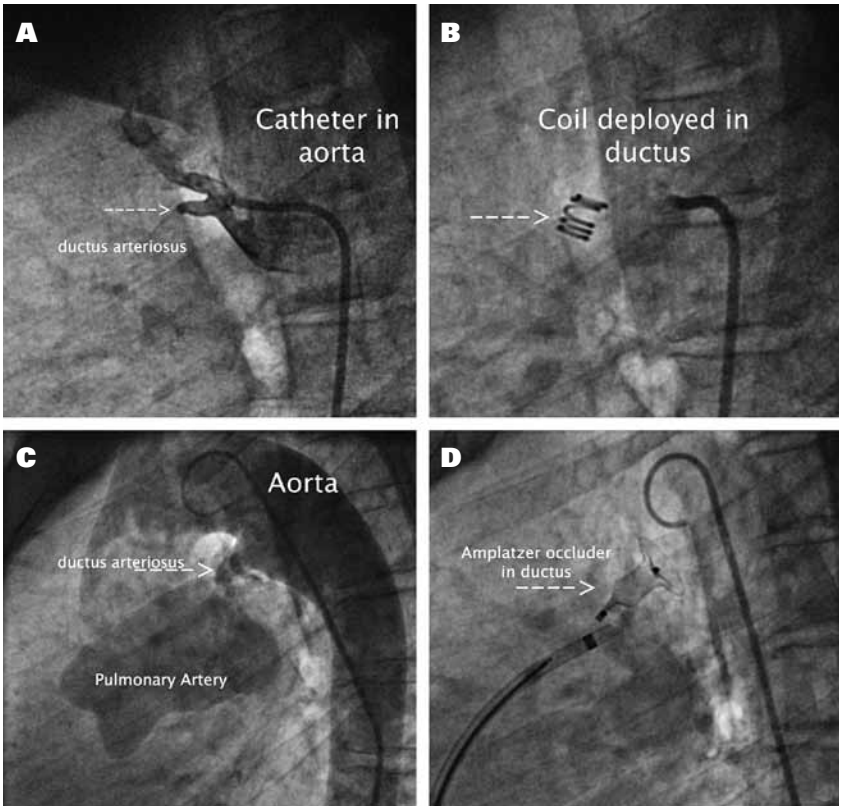

Figure 3. Patent ductus arteriosus

Figure 3. A: Patent ductus shown from contrast injection from the aorta. The small defect results in minimal evident blood flow into the pulmonary artery in this image. **B:** The defect shown in image A has been closed using Cook "Flipper" coils (Cook Medical, Bloomington, IN). **C:** A larger patent ductus is shown with flow evident from the aorta into the pulmonary artery. **D:** Defect shown in image C successfully closed with an Amplatzer duct occluder (St. Jude Medical, St. Paul, MN).

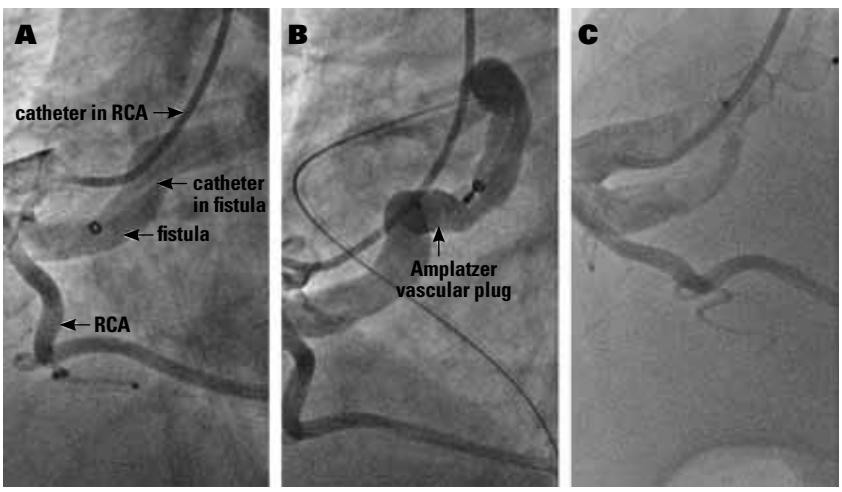

Figure 4. Atrial septal defects

Figure 4. A: Large fistula (centre) from the right coronary artery to the right atrium in a 45-year-old man who had previously experienced an episode of bacterial endocarditis and right atrial vegetation that was successfully treated with antibiotics. **B:** Delivery cable for 12-mm Amplatzer vascular plug can be seen traversing the right atrium from the lower right corner of the image toward the upper left and entering the fistula, where the cable will be used to position and deploy the plug. **C:** Successful occlusion of fistula after deployment of the plug.

Relieving obstructions

Relieving obstructions in native vascular or postsurgical connections involves basic interventional cardiac and vascular procedures. Typically, the structure to be treated is crossed with a guide wire and then prepared with a balloon. Although the balloon may be a definitive treatment, contemporary procedures usually employ stents to improve the immediate and long-term result. A variety of wires are available along with balloon and stent products that range from several millimetres to 30 mm in diameter. Stents are typically made from stainless steel and alloys of platinum and iridium or cobalt and chromium, and may be used as bare metal scaffolds or with a covering of polyethylene to reduce the risk of vascular rupture (**Figure 5**).

Venous obstructions. There are no clear indications for treating obstructions involving the venous circulation. However, even a small pressure gradient can be important in inhibiting venous return. Also, since the pressure is typically assessed and measured at rest, a low pressure gradient can be expected to worsen on exercise when greater venous return is required to increase cardiac output. An example of a repair for an extreme case of obstructed venous return is shown in **Figure 6**. The patient originally had complex congenital heart disease and was palliated with a number of surgical procedures over many years before undergoing heart transplantation. Given the significantly abnormal anatomy, the transplant surgeon needed to construct unique connections to provide venous return from the patient to the donor heart. In the postoperative period, one of these connections from the head and neck did not remain patent and the connection from the inferior vena cava was restrictive because it was necessary to use a portion of a pre-existing conduit. These anomalies were successfully treated by percutaneous stent placement in a two-stage procedure. Treatment also included working directly with a device manufacturer to create a custom-made covered stent, a requirement in cases where the anatomy is very complex and there is no product readily available.[8,9]

Figure 5. Stents commonly used for treating congenital heart disease.

From left: expanded and unexpanded Cheatham-Platinum (CP) stents. **From right:** expanded and unexpanded, covered versions of CP stents (NuMed, Hopkinton, NY).

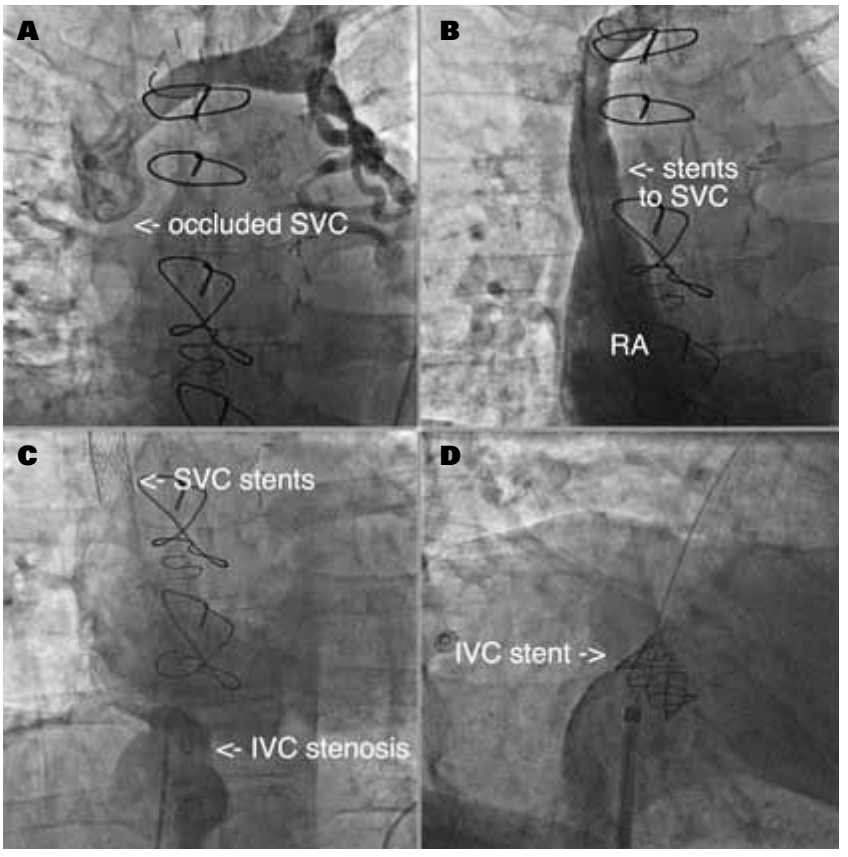

Figure 6. Venous obstructions

Figure 6. A: Obstructed connection from the superior vena cava to the right atrium in a heart transplant patient. **B:** Obstruction seen in image A treated with three percutaneous stainless steel Genesis stents (Cordis Corp, Fremont, CA). **C:** Heart of same transplant patient showing stenosis at the inferior vena cava connection to the right atrium as a result of a remnant of synthetic conduit left from a previous surgical procedure. **D:** Stenosis seen in image C treated with placement of a custom-made 16-by-22-mm Cheatham-Platinum stent (NuMed, Hopkinton, NY).

Aortic and valvular obstructions. Indications are usually clearer for treating aortic and valvular obstructions; these issues can often be resolved with interventional procedures as shown in **Figure 7**.

Aortic coarctation is an example of an obstruction that can be successfully managed without complex surgery using a contemporary approach that employs covered stents. In general, a peak-to-peak systolic pressure gradient of less than 20 mm Hg is an indication for intervention, although other factors, such as the presence of systemic hypertension, left ventricular hypertrophy, or extensive collaterals, will also influence the management decision.

Although the more common example of percutaneous aortic valve implantation has been well described,[10] percutaneous implantation was originally used for valves in the pulmonary position for patients with significant right ventricular outflow tract obstruction or severe pulmonic regurgitation.[11] The first valve available was approved in Canada in 2007. The Melody valve (Medtronic, Minneapolis, MN) is constructed from bovine jugular vein and is indicated for relief of obstruction and/or regurgitation in right ventricular to pulmonary artery conduits ranging from 14 to 22 mm. The number of adult patients who can benefit from implantation of this valve has been limited despite improved techniques, largely because of the small valve size. Recently, the SAPIEN XT valve from Edwards Lifesciences has become the valve of choice because of the availability of larger sizes more suitable for use in adults.

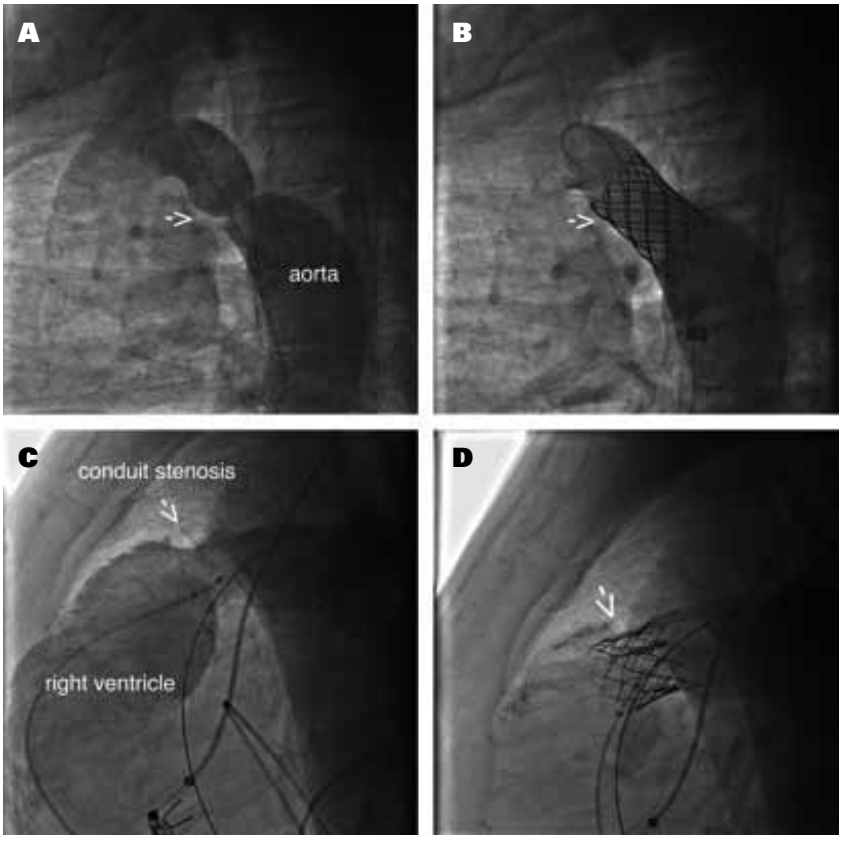

Figure 7. Aortic and valvular obstructions.

Figure 7. A: Focal coarctation of the aorta. **B:** Stenosis seen in image A and problem of associated pressure gradient are resolved with placement of covered stent (NuMed Inc, Hopkington, NY). **C:** Stenosis in conduit from right ventricle to pulmonary artery. **D:** Stenosis seen in image C is resolved with placement of a large stent (Johnson and Johnson, New Brunswick, NJ), which also helps address significant pressure gradient and pulmonary valve incompetence by providing an anchoring site for a SAPIEN transcatheter heart valve (Edwards Lifesciences, Irvine, CA).

Aortic coarctation is an example of an obstruction that can be successfully managed without complex surgery using a contemporary approach that employs covered stents.

Summary

Since the first successful ligation of a patent ductus arteriosus by Dr Robert Gross, cardiac surgery for congenital

Technological advances allow us to treat both relatively simple and very complex problems using percutaneous techniques.

defects has made great strides. Today management for adult CHD addresses problems in patients with previously undiagnosed pediatric disease that presents in adulthood, anticipated residual disease following a pediatric surgical procedure, and unanticipated deterioration following a pediatric surgical procedure. Technological advances also now allow us to treat both relatively simple and very complex problems using percutaneous techniques. Broadly speaking, interventions fall into two main categories: those for closing abnormal connections and those for relieving obstructions.

With a growing population of patients with adult congenital heart disease and the developing technologies available to us, we will continue to need well-integrated CHD programs that permit collaboration between adult and pediatric medical and surgical subspecialists. We will also need to consider which is the most appropriate surgical or interventional option for each patient.

Competing interests
None declared.

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Special considerations in the management of adult congenital heart disease

Patients with adult CHD who experience pregnancy-related cardiovascular disease, pulmonary arterial hypertension, or arrhythmias can benefit from the help of a multidisciplinary care team and advances in imaging technology.

ABSTRACT: Special considerations for the management of adult congenital heart disease include pregnancy-related cardiovascular disease, pulmonary arterial hypertension, and arrhythmias. Improvements in the treatment of congenital heart disease mean that more women with congenital heart disease are reaching childbearing age. In BC the Cardiac Obstetrics clinic at St. Paul's Hospital provides coordinated care for pregnant women with cardiac conditions. The clinic also offers preconception counseling so that couples can make informed choices about pregnancy. Another service based at St. Paul's Hospital, the Pacific Adult Congenital Heart clinic, helps manage patients with pulmonary arterial hypertension, a progressive condition affecting around 10% of adult congenital heart disease patients. Agents used to treat pulmonary arterial hypertension include endothelin receptor antagonists and phosphodiesterase type 5 inhibitors. The Pacific Adult Congenital Heart clinic also manages patients with a significant arrhythmia, often the first manifestation of deterioration in complex congenital heart disease. Complications that can result from arrhythmias include heart failure, thromboembolism, and sudden cardiac death. A range of complementary imaging modalities aid in the management of all these conditions by enabling the assessment of ventricular and valvular function (echocardiography and magnetic resonance imaging), quantification of right ventricular volume (multidetector computed tomography), and exclusion of coronary stenosis (coronary CT angiography).

This article has been peer reviewed.

Complications in adult congenital heart disease (CHD) include pregnancy-related cardiovascular disease (CVD), pulmonary arterial hypertension (PAH), and arrhythmias. Patients with these complications can benefit from a variety of treatments and management approaches. They can also benefit from advances in diagnostic imaging.

Pregnancy-related CVD

At present, 0.2% to 4.0% of all pregnancies in Western industrialized countries are complicated by cardiovascular disease, and the number of patients who develop cardiac

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complications during pregnancy is increasing.[1] This is a unique circumstance where management for optimal outcome needs to consider both the mother and the fetus. The only current guidelines for managing CVD during pregnancy[2] emphasize the following aspects of care:

- Counseling and managing women of childbearing age with suspected cardiac disease should start before pregnancy occurs.
- Pregnant women with CVD should be managed by specialized interdisciplinary teams.
- High-risk patients should be treated in specialized centres.
- Diagnostic procedures and interventions should be performed by specialists with expertise in managing pregnant patients.

The nature of CVD in pregnancy differs from one country to another. In Western countries, the risk of acquired CVD in pregnancy has increased because of greater age at first pregnancy and growing rates of diabetes, hypertension, and obesity. Also, the treatment of congenital heart disease has improved, resulting in more women with CHD reaching childbearing age.[3] In Western countries heart disease is now the major cause of maternal death during pregnancy.[4]

Pregnancy induces changes in the cardiovascular system to meet the increased metabolic demands of the mother and fetus. These changes include increases in blood volume and cardiac output, and reductions in systemic vascular resistance and blood pressure. Along with other physiological demands of pregnancy, these changes are variably tolerated by women with CVD, and in some cases pregnancy should be avoided. There are many tools available to determine the cardiovascular risk of pregnancy in women with CVD.[5,6] Certainly the World Health Organization (WHO) classification of maternal cardiovascular risk[2] is the most straightforward and helps to stratify pregnancy risk in a broad sense.[7] A more granular risk assessment can be made using risk scores and lesion-specific research data.

Obstetric care

A special multidisciplinary team for the care of pregnant women with CVD operates at St. Paul's Hospital in collaboration with BC Women's Hospital (**Figure 1**). The Cardiac Obstetric (COB) clinic, the first of its kind in Western Canada, was established 15 years ago to serve the growing number of women with cardiac conditions who require specialized cardiac and obstetric care. This clinic sees patients once a week and is attended by one of two designated cardiologists, the maternity clinical nurse specialist, and the COB nurse patient educator. This is also a teaching clinic that is attended by cardiology residents, congenital heart disease fellows, and maternal-fetal medicine fellows.

Women referred to the clinic have a range of cardiac conditions that are either acquired or congenital. Initial consultation is provided and the frequency of follow-up is determined by the severity of the underlying disease and the clinical status of the patient. Care provided through the clinic ranges from conservative follow-up and minimal intervention to more active management, which might include the following:

- Pharmacological treatment for complications such as heart failure, arrhythmias, pulmonary hypertension, and thromboembolism.
- Interventions such as electrical cardioversion, cardiac catheterization, ablation for arrhythmias, percutaneous closure of atrial septal defects, and mitral valvuloplasty.
- Cardiac surgery.

The integral role of obstetrics in this clinic ensures that both cardiac and obstetric care are provided in a planned and coordinated fashion. Many patients are referred from other parts of BC, and whenever possible support is given so that women with low or moderate risk can deliver in their community. The clinic has worked hard to organize patient-specific care plans regardless of the patient's risk level or place of deliv-

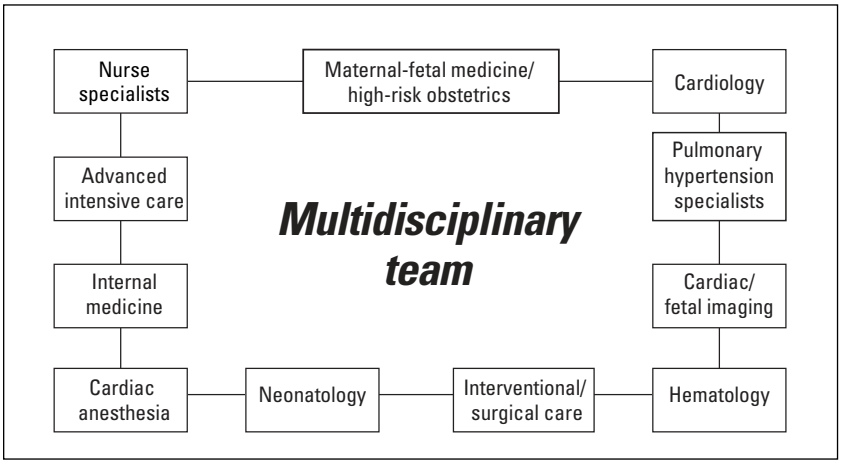

Figure 1. Services and specialists providing care to women at the Cardiac Obstetric (COB) clinic at St. Paul's Hospital.

ery. These highlight individual cardiac and/or obstetric concerns while helping to reassure and guide medical teams with patient management during pregnancy, labor, and delivery.

There is a monthly conference where the cases of all women followed through the clinic are discussed and care plans are reviewed by the members of the multidisciplinary COB team. A wide range of complex cardiac conditions have been successfully managed through the clinic. Patients have included those with cyanotic heart disease, single-ventricle physiology, severe pulmonary hypertension, and mechanical heart valve replacement. Many moderate-cardiac-risk and all high-cardiac-risk women are followed and deliver their babies at St. Paul's Hospital. The COB clinic also has a well-established registry and research is a very important component of the program.

Preconception counseling

An additional essential service offered by the COB team is preconception counseling. It is imperative that couples understand the risk to maternal health posed by a pregnancy. Considerations include the risk of a cardiovascular complication in pregnancy, labor, or delivery; the long-term impact of pregnancy on the progression of underlying cardiac disease; and the possible effect of a cardiac lesion on maternal life expectancy. Understanding these risks allows couples to make informed choices about pursuing pregnancy. In some cases, women have been told previously that they should not become pregnant, when in fact this may not have been appropriate advice. In other cases, women with high-risk conditions such as pulmonary hypertension and cardiomyopathy may not be aware of all their risks and the care required through a complex pregnancy.

Another important aspect of care for young women with CVD is related to their risk of bearing a child with congenital cardiac defects. The risk for parents without CVD is approximately 1%. The risk can be higher in parents with hereditary conditions, and in general the risk is higher when the mother rather than the father is affected by CVD.[8] Depending on the type of maternal heart disease, the recurrence risk in offspring varies between 3% and 50%.

Pulmonary arterial hypertension

Pulmonary arterial hypertension is common in adult CHD, complicating around 10% of all cases.[9,10] PAH is a progressive condition resulting in hypertrophy and proliferation of the small pulmonary arteries, which can cause increased resistance to flow across the pulmonary circulation, right ventricular failure, and, ultimately, death.[11] While the condition is incurable, patients have benefited over the past 20 years from the development of remarkable therapies that slow the remodeling process and result in prolonged life and improved symptoms.[12,13]

In patients with congenital heart disease, PAH is triggered by systemic to pulmonary artery shunting. The increased blood flow through the pulmonary circulation induces the remodeling of the pulmonary vasculature that produces PAH.[14,15] Increased flow through the pulmonary arteries results in functional and structural changes to the small pulmonary arteries.[15-17] These changes increase the resistance to flow and result in a progressive increase in pulmonary artery pressures. Eventually, the pressures in the pulmonary circulation may rival those in the systemic circulation and reverse the direction of the shunt. The consequent shunting of deoxygenated blood from the right side to the left side of the heart results in the chronic hypoxemia and cyanosis associated with Eisenmenger syndrome, the most advanced form of PAH associated with CHD.[18] This form of pulmonary hypertension represents a subtype of WHO group 1 pulmonary arterial hypertension.[19,20] Factors influencing its development include the complexity, location, and size of the CHD lesion[18,21] The most common presenting symptom is breathlessness.[16] Syncope is an ominous prognostic symptom that portends a poor outcome.[22]

Screening for PAH

The screening test of choice for pulmonary arterial hypertension is a transthoracic echocardiogram. An estimated pulmonary systolic pressure greater than 35 mm Hg, especially if accompanied by right ventricular enlargement or dysfunction, should raise concern for PAH.[23] The diagnosis of PAH is based on invasive pressure measurement at cardiac catheterization. In PAH, catheterization reveals elevated pulmonary artery pressures (mean pulmonary artery pressure greater than 25 mm Hg) and low left atrial pressures (wedge pressure less than 15 mm Hg), along with elevated pulmonary vascular resistance (greater than 3 Wood units).[11] Given the rarity and complexity of PAH associated with CHD, it is essential that evaluation and management proceed in a centre with expertise in the management of both CHD and PAH.

Therapy for PAH

Currently, agents for PAH approved for use in Canada include the prostanoid agonists (epoprostenol and treprostinil), endothelin receptor antagonists (bosentan, ambrisentan,

and macitentan), the phosphodiesterase type 5 inhibitors (sildenafil and tadalafil), and the soluble guanylate cyclase stimulator riociguat. These agents were approved primarily on the basis of trials done in the general WHO group 1 PAH population. However, there are a few notable exceptions where patients with PAH associated with CHD were studied specifically,[24-28] or are being studied specifically.[29] Unfortunately, research results so far show that therapy with these agents slows but does not halt or reverse pulmonary vascular remodeling. Many patients eventually worsen despite optimal pulmonary hypertension therapy. For these patients, either lung transplant, lung transplant with cardiac surgery to repair the congenital defect, or combined heart-lung transplant are ultimately required.

In British Columbia, care for patients with CHD-associated PAH is centralized at St. Paul's Hospital in Vancouver at the Pacific Adult Congenital Heart (PACH) clinic, the first such clinic in Canada and the model for other adult CHD centres. At the clinic, each patient is seen by both a pulmonary hypertension expert and an adult CHD cardiologist. This has been a highly successful collaborative venture that has resulted in markedly improved communication between health care providers and much more efficient and effective care for patients. Patients followed through this clinic are frequently on pulmonary arterial hypertension therapy, including endothelin receptor antagonists, phosphodiesterase type 5 inhibitors, or a combination of these agents. A strong partnership between the clinic and general cardiologists, respirologists, internists, and primary care physicians outside the Lower Mainland allows these patients to be followed in their local communities throughout the province.

Arrhythmias

Arrhythmias are often the first manifestation of deterioration in complex CHD, and can lead to further cardiac decompensation if not treated on a priority basis. Arrhythmias in adult CHD should be identified, investigated, and treated promptly with input from an adult CHD centre. A thorough clinical history, physical examination, and hemodynamic assessment are essential. If any associated symptoms, heart failure, and/or hemodynamic abnormalities are identified, prompt referral to an adult CHD heart rhythm specialist is indicated.

Up to 30% of adult CHD patients have significant arrhythmia as an additional diagnosis. Arrhythmias are the leading cause of morbidity, impaired quality of life, emergency room visits, hospitalization, and mortality in this patient population.[30] The entire spectrum of arrhythmias is encountered in adult CHD, with several types often coexisting in the patient at presentation or afterwards. Several factors make the heart more susceptible to rhythm disorders in adult CHD, including congenitally displaced or malformed sinus nodes or atrioventricular conduction systems; primary myocardial disease; scarring from previous ischemic insult or surgery; residual or postoperative hemodynamic sequelae; and intra-atrial or intraventricular conduction propagation.

Certain adult CHD lesions are associated with a very high risk of rhythm problems. For example, in congenitally corrected transposition of the great arteries, approximately 20% of patients develop complete atrioventricular node conduction block by adulthood and require pacemaker implantation.[31] In patients with prior surgery in the region of the sinus node or its arterial supply (e.g., patients who have undergone a Mustard or Senning procedure for transposition of the great arteries), incidence of bradycardia with sinus node dysfunction is high.[32]

Approximately 50% of adults with CHD develop an atrial tachyarrhythmia during their lifetime.[33] Intra-atrial reentry tachycardia or flutter is the most common tachyarrhythmia in adult CHD due to scar-related abnormalities. Although atrial fibrillation is relatively uncommon in the younger adult CHD population, the prevalence of atrial fibrillation increases with age. It is important to note that atrial arrhythmias can often be difficult to detect in this population and the clinician needs to maintain a high index of suspicion as atrial arrhythmias can lead to catastrophic events. Ventricular arrhythmias are the leading causes of sudden death in several subtypes of CHD. Although the absolute incidence of cardiac arrest remains relatively low (approximately 0.1% per year), the overall risk is up to 100 times higher than in an age-matched control population.[34]

Investigating arrhythmias

Accurate delineation of arrhythmias can be accomplished with 12-lead electrocardiogram, Holter monitoring, cardiac event loop recorders, implantable loop recorders, and interrogation of already implanted devices such as pacemakers or defibrillators. An electrophysiological study (EPS) may be considered when the conventional diagnostic workup is unrevealing in adults with CHD and symptoms suggest sustained arrhythmia. An EPS can also be indicated in cases with unexplained syncope and high-risk anatomical substrates associated with primary ventricular arrhythmias or poorly tolerated atrial tachyarrhythmias. High-risk substrates include tetralogy of Fallot, transposition of the great arteries with atrial switch surgery, and systemic or

single-ventricle anatomy. However, an inability to induce an arrhythmia in the electrophysiology lab does not fully exclude the possibility of a clinical arrhythmia.[35]

Many complications can occur as a result of arrhythmias, including heart failure, thromboembolism, and sudden cardiac death, and it is important to ensure that worsening hemodynamics are not the cause of the arrhythmia. Adults with CHD who have new-onset or worsening arrhythmias and those who have been resuscitated after sudden cardiac death should undergo hemodynamic assessment, including detailed imaging with echocardiography, cardiac magnetic resonance imaging, and/or cardiac catheterization. New or worsening regurgitant or obstructive lesions, shunts, ischemia, ventricular dysfunction, and coronary abnormalities can all precipitate arrhythmias.

Managing arrhythmias

Managing arrhythmias in adult CHD patients can be complex and may involve additional considerations:

- Coexisting sinus or atrioventricular node dysfunction.
- Large scar formation and other effects of previous cardiac surgery.
- Underlying hemodynamic lesions.
- Vascular access issues.
- The patient's childbearing potential.

Such considerations can make input from an adult CHD arrhythmia specialist vital. For example, if pacemaker implantation is recommended for a patient with a heart that is difficult to access because of baffles and abnormal anatomy, endovascular rather than epicardial lead placement may have to be considered. Vascular access can also be an issue in a patient requiring electrophysiology studies and ablation therapy because pharmacological therapy is ineffective. Again, impenetrable scar tissue, baffles or conduits, and abnormal intracardiac connections may have to be taken into account.

Arrhythmia management should also include risk assessment for sudden cardiac death, heart failure, and thromboembolic risk—details beyond the scope of this article but readily available from the Heart Rhythm Society[30] and Canadian Cardiovascular Society.[36]

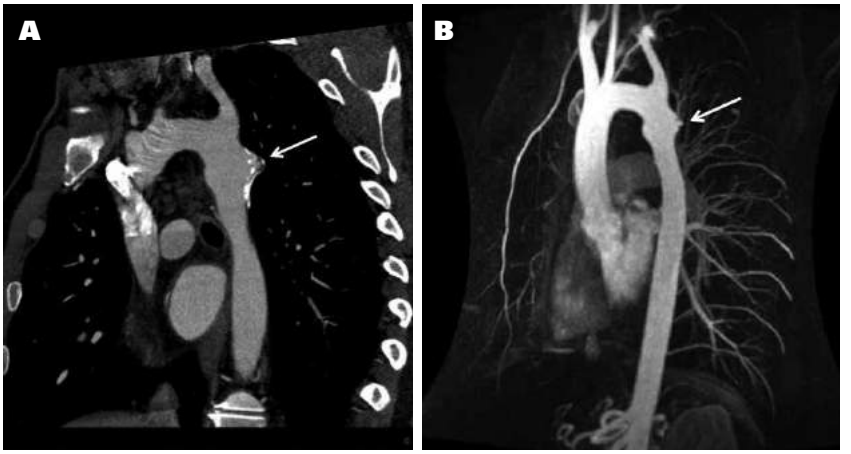

Figure 2. Complementary imaging techniques were used to reveal a small pseudoaneurysm (see arrows) at the site of a previous coarctation repair in the thoracic aorta of a 38-year-old male.

A: Multiplanar reformatted IV contrast-enhanced ECG-gated CT image. **B:** Sagittal oblique view of an MRI time-resolved imaging of contrast kinetics (TRICKS) sequence following administration of gadolinium.

Role of imaging in adult CHD

With advances in imaging technology and the longer life expectancy of CHD patients, the role of diagnostic imaging in this patient population has expanded. Echocardiography is the main routine imaging modality in adults with CHD, enabling assessment of ventricular function, valvular function, and integrity of surgical repairs. Magnetic resonance imaging (MRI), with its excellent spatial resolution and ability to assess ventricular and valvular function without the use of ionizing radiation, has played an essential role in the evaluation of adult CHD. Concerns about potential stochastic effects of ionizing radiation have previously limited the use of multidetector computed tomography (MDCT). However, the introduction of radiation dose-reduction strategies and recent advancements in CT technology have made MDCT an essential tool for the evaluation of many patients with CHD. Recent advancements include submillimetre spatial resolution in all imaging planes, the ability to synchronize the acquisition to the ECG, and temporal resolution as low as 66 msec.

The imaging modalities now commonly used in adult CHD for diagnosis (**Figure 2**), assessment (**Figure 3**), and follow-up all have strengths and weaknesses.

MRI is the most common noninvasive imaging modality used to support echocardiography. It offers excellent three-dimensional assessment and visualization of the often complex postsurgical anatomy and highly reproducible quantification of left and right ventricular volumes and systolic function. It is also com-

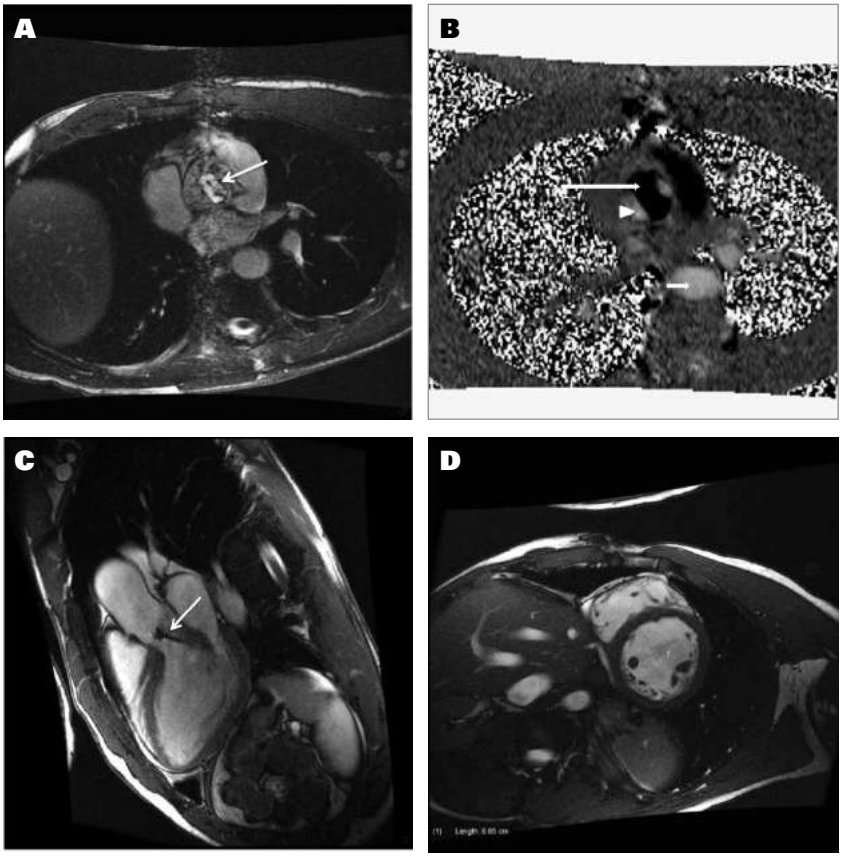

Figure 3. Several imaging modalities were used to assess a 27-year-old male for aortic dilatation, aortic regurgitation (AR), and left ventricular function and size in the setting of bicuspid aortic valve.

A: Bicuspid anatomy (arrow) seen with aortic valve plane FIESTA MRI sequence. **B:** Black forward flow (long arrow) with white regurgitant flow (arrow head) in same direction as white descending aortic flow (short arrow) seen with functional quantitative assessment of AR on phase contrast imaging. **C:** Qualitative visualization of AR by flow jet (arrow) across valve plane seen on FIESTA left ventricular outflow tract view. **D:** Ventricular functional analysis and size evaluation seen on short-axis FIESTA imaging.

monly used for the assessment of valvular function and for myocardial tissue characterization through the administration of intravenous gadolinium contrast medium.[37-40] Importantly, MRI does not require the use of ionizing radiation and is therefore a good tool for serial follow-up. Such serial follow-up is warranted after tetralogy of Fallot repair to assess for degree of pulmonary insufficiency as well as size and function of the right ventricle; after coarctation repair for assessment of aortic size and repair site complication; for the quantification of ventricular volumes and function in patients with complex cardiac anatomy; and for evaluation of surgical repair integrity and aortic dimensions. MRI-derived endpoints can also be essential to management in these circumstances.

Many adult CHD patients cannot undergo MRI assessment because they suffer from claustrophobia, they have metallic coils in place that may heavily degrade image quality, or they have an implanted cardiac device. Fortunately, rapid improvements in MDCT have helped fill this imaging gap. Given the good concordance between MDCT and MRI findings, multidetector computed tomography is being used increasingly for the quantification of right ventricular volumes and function in those patients unsuitable for MRI assessment. MDCT is able to evaluate the configuration and anatomical dimensions of the right ventricular outflow tract, which are major factors when determining whether a patient is suitable for percutaneous pulmonary valve replacement.

Coronary CT angiography (CCTA) is now well established as the gold standard for noninvasive detection and exclusion of coronary stenosis. CCTA is also being used increasingly for evaluation of the coronary arteries in patients with coronary anomalies, coronary fistulas, and Kawasaki disease, and after surgical repair for CHD requiring coronary artery manipulation.

When combined with findings from clinical and physiological assessment, information from these complementary imaging modalities plays a key role in diagnostic and treatment decision making. Obtaining images in more complex adult CHD cases requires a multidisciplinary team with specific expertise and knowledge. Often the images are reviewed with the entire team so that different perspectives and interpretations can be integrated and considered in a clinically meaningful way.

Summary

Pregnancy-related cardiovascular disease, pulmonary arterial hypertension, and arrhythmias are complications that can affect adult CHD patients.

With improvements in the treatment of congenital heart disease, the number of women with CHD who reach childbearing age is increasing. In BC a special multidisciplinary Cardiac Obstetrics clinic at St. Paul's Hospital provides coordinated care for pregnant women with cardiac conditions. In addition, the clinic offers preconception counseling so that couples can make informed choices about pregnancy.

The Pacific Adult Congenital Heart clinic, also based at St. Paul's, helps manage patients with pulmonary arterial hypertension, a progressive condition affecting around 10% of adult CHD patients. Patients followed through this clinic are frequently on PAH therapy, including endothelin receptor antagonists, phosphodiesterase type 5 inhibitors, or a combination of these agents.

Other adult CHD patients requiring follow-up are those with a significant arrhythmia, often the first manifestation of deterioration in complex CHD. Complications that can result from arrhythmias include heart failure, thromboembolism, and sudden cardiac death.

Adult CHD patients with any of the complications discussed here can benefit from recent advances in imaging technology. A range of complementary modalities now enable assessment of ventricular and valvular function (echocardiography and magnetic resonance imaging), quantification of right ventricular volume (multidetector computed tomography), and exclusion of coronary stenosis (coronary CT angiography).

Adult CHD patients with any of the complications discussed here can benefit from recent advances in imaging technology.

Competing interests

None declared for Drs Grewal, Brunner, Ellis, Leipsic, Levy, Barlow, and Chakrabarti. Dr Swiston has received honoraria for speaking engagements and advisory board participation from pharmaceutical companies that market products used to treat pulmonary arterial hypertension: Actelion, Eli Lilly, Pfizer/Encysive, Bayer, GSK, and Unither.

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Karen LeComte, MSN, RN, Brian Sinclair, MD, FRCPC, Sarah Cockell, PhD, RPsych, Emma Iacoe, MSN, RN, Alexia Gillespie, BSN, BEd, RN, Derek Human, MD, FRCPC

Ensuring a successful transition and transfer from pediatric to adult care in patients with congenital heart disease

As CHD patients make the shift from a family-centred pediatric model of care to an autonomous adult model, self-management and self-advocacy skills become essential, and resources available through the Transitioning Responsibly to Adult Care initiative (ON TRAC) can be useful.

ABSTRACT: Patients with congenital heart disease require lifelong surveillance for arrhythmias, ventricular failure, and complications associated with childhood surgery. When pediatric patients with congenital heart disease become adults they can be lost to follow-up or experience lapses in care that expose them to greater risk of adverse health outcomes. A successful transition and transfer from pediatric to adult care supports youth attachment to both a primary care provider and a specialized cardiology clinic—ensuring quality and continuity of care. Transition refers to a process that begins in early adolescence and continues through early adulthood when health care management shifts from the family to the patient. Transfer is an event that occurs when the responsibility for patient care moves from one health care team to another. In BC pediatric patients with congenital heart disease are transferred from the Children's Heart Centre to the Pacific Adult Congenital Heart Disease program at age 18. Resources that can aid in transition and transfer include toolkits developed through the Transitioning Responsibly to Adult Care initiative and information provided by the iHeartChange website. Primary care considerations for young adult patients include cardiac surveillance and screening, sexual and reproductive health, and psychosocial health. The population of congenital heart disease patients is growing and aging, and continued attention will be needed to ensure these patients move successfully from pediatric to adult care.

This article has been peer reviewed.

Population estimates indicate there are approximately 12 000 adults with moderate and severe congenital heart disease (CHD) in British Columbia. The significant increase in patient numbers (estimated growth to be more than 5% per year) is attributable to the excellent survival outcomes for young patients with CHD achieved in past decades and the greater awareness of services for these patients. Services include pediatric care provided through the Children's Heart Centre at BC Children's Hospital (BCCH) and adult care provided through the Pacific Adult Congenital Heart Disease (PACH) clinic at St.

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Paul's Hospital. Ensuring a successful transition and transfer from pediatric to adult care is critical to maintaining patient health in adulthood.

There are 15 specialized adult CHD centres across the country, all belonging to the Canadian Adult Congenital Heart network or CACH network (www.cachnet.org). The PACH clinic is one of five that offer a full range of services and qualifies as a supraregional centre. CACH network has been instrumental in establishing templates and guidelines for standardized follow-up of many adult CHD conditions. Building on this work, the Canadian Cardiac Society (CCS) convened a panel of international experts for an adult CHD consensus conference in 1996.[1] Foremost among the proposals arising from this forum was a recommendation that all patients be referred to specialized centres for ongoing care. Mylotte and colleagues documented an increase in referrals to specialized centres in Quebec after publication of the CCS recommendations in 1998, and demonstrated that referral was independently associated with a significant decrease in mortality, supporting the model of specialized care for patients with adult CHD.[2]

Pacific Adult Congenital Heart clinic

The PACH clinic was established at Shaughnessy Hospital in 1988 to respond to a gap in health services for adults with CHD, and moved to St. Paul's Hospital in 1993. The PACH team, a multidisciplinary group of health professionals with advanced training in adult CHD, is a unique provincial resource that provides comprehensive health services to CHD patients. The core team includes adult and pediatric cardiologists, cardiac surgeons, cardiac radiologists, patient educators (registered nurses), a clinical nurse specialist, a psychologist, a genetic counselor, and a social worker. Additional specialists are recruited as required. Services provided include consultation, ongoing medical care, cardiac surgery, cardiac intervention, electrophysiology procedures, diagnostic imaging, obstetrical care, and patient and family education and counseling.

A team approach to care is integral to optimizing the health of this complex patient population.

Patients are discussed at weekly case conferences and bimonthly morbidity and mortality rounds. Cardiology fellows, residents, medical students, and other health care professionals in training also attend, which ensures ongoing education for those caring for this patient population. There is a PACH physician on call 24 hours a day, 7 days a week, to assist physicians and other health care providers throughout the province. The PACH team provides comprehensive, cost-effective care to adults with CHD.

A team approach to care is integral to optimizing the health of this complex patient population. The PACH patient educators are the initial point of contact for both patients and community health care providers. The patient educators provide case management and liaise on a daily basis with the PACH team to support patient wellness and assist with the challenges of navigating the health care system. During clinic visits, patient-centred education is based on a chronic disease self-management model. When patients have a better understanding of their individual cardiac condition they are able to recognize concerning symptoms, communicate effectively with their health care providers, and determine when it is appropriate to seek medical attention. Patient educators are available to provide ongoing support in these areas and to facilitate self-management by connecting patients with resources when necessary. Telehealth services support patients and their health care providers to manage their CHD and facilitate additional patient education outside clinic hours.

The PACH clinic currently follows 2700 active patients and has a wait time of 3 to 4 months for patients to be seen on a nonurgent basis. The volume of patients served has almost tripled in the last decade and the clinic has been advocating for expanded services. To accommodate the growing population of adults with CHD throughout BC, a closer-to-home care model, patterned on the success

of BCCH's Cardiology Partnership Program, is being explored to bring adult CHD services to communities outside the Lower Mainland. Partnering with communities and local health care providers has proven successful when serving other populations with chronic health conditions. Bringing the expertise of adult CHD specialists to communities across the province would support care providers in local communities to deliver quality care to this group of complex patients.

Moving from pediatric to adult care

Currently most children born with CHD are surviving, and can be expected to thrive well into their adult years. There are now more adults than children with CHD. With the surgical advancements of the past several decades, 95% of pediatric congenital heart disease patients will now transfer to adult care, the largest growth in this population being youth with complex CHD.[3,4] Adults with CHD are pursuing advanced education, building careers, and starting families of their own. Lifelong cardiac follow-up is required to achieve the best health outcomes for these patients. To support seamless cardiac care across the lifespan of a congenital heart patient, a structured transition process followed by a transfer of care is necessary.

Transition and transfer

A successful transition and transfer from pediatric to adult CHD care supports youth attachment to a primary care physician and specialty clinic(s) and ensures continuity of care. Transition refers to a process that begins in early adolescence and continues through early adulthood when health care management shifts from the family to the patient.[5,6] Transfer is an event that occurs when the patient moves from one health care team to another. When transition and transfer from pediatric to adult health care are less than optimal, the repercussions can be serious, and may include hospital admissions, adverse health events, and even death.[7] The potential for residual disease and complications following childhood management of CHD necessitates lifelong surveillance for arrhythmias, ventricular failure, and the need for further surgery.[3]

An estimated 30% to 70% of CHD patients are lost to follow-up or experience lapses in care,[8,9] situations that expose them to greater risk of adverse health outcomes. Gaps in care are more frequent in males, in those with mild and moderate defects, and in patients with a history of follow-up outside an adult CHD clinic.[4,8,9] Additional challenges to successful transition include patient adherence, relocation, and attachment to a specialty clinic.[6] As CHD patients move from a family-centred pediatric model of care to an autonomous adult model, self-management and self-advocacy skills become essential.[10] Transition and transfer must be seen as essential elements in the care of patients with CHD. Expert consensus recommends that structured plans be developed to facilitate the transition process.[6]

Multiple tools and strategies have been developed and are being evaluated to support the transition and transfer process for youth with CHD as they move from the Children's Heart Centre at BCCH to the PACH program at St. Paul's Hospital when they reach age 18.

ON TRAC initiative

Transitioning Responsibly to Adult Care (ON TRAC) is a provincial initiative that supports youth with chronic health conditions as they prepare to move from pediatric care and then as they transfer and attach themselves to the adult health care system. Using a framework from the Institute for Healthcare Improvement Triple Aim framework, ON TRAC consists of four separately funded projects focused on policy change, clinical practice, health system performance, and youth engagement. Key stakeholders are involved at every level to inform decisions, develop and test tools, and shape recommendations. ON TRAC is supported with funding from the Vancouver Foundation, BCCH, Child

Multiple tools and strategies have been developed and are being evaluated to support the transition and transfer process for youth with CHD.

Health BC, and the Shared Care Committee (SCC) and Specialist Services Committee (SSC)—joint committees of Doctors of BC and the BC Ministry of Health.

ON TRAC reflects work done by groups of pediatric and adult care providers, patients, and families to address gaps that have traditionally been a challenge in the transition from pediatric to adult care by:

- Preparing youth and families with skills to function in the adult system.
- Supporting health care providers through clinical guidelines, training, tools, and online resources.
- Defining the role of community-based family physicians in providing continuity of care.
- Defining appropriate referral pathways and care requirements for youth with complex health conditions.

ON TRAC reflects work done by groups of pediatric and adult care providers, patients, and families to address gaps that have traditionally been a challenge in the transition from pediatric to adult care.

The ON TRAC package of transition and transfer tools for CHD patients, family members, and care providers was developed to ensure that a comprehensive transfer of care occurs when the transition is complete. The package includes:

- Transition Clinical Pathways (TCP) form: Developed through BCCH, this form is used to guide the preparation of youth and document their readiness to manage their care in the adult care system. The TCP is provided to adult specialists and community-based family practitioners at the time of transfer. The form lists cardiac-specific tests and reports and highlights areas where additional education and support are required to help the young patient acquire the knowledge and skills needed for self-management. (www.bcchildrens.ca/transition-to-adult-care/Documents/TCPCOMPLEXCARDIOLOGY.pdf)
- Medical Transfer Summary (MTS) form: Developed with the support of BCCH and the SCC, this form ensures that the family physician, community care providers, and the specialty clinic receive a comprehensive summary of the medical history (including details about investigations, surgeries, medications, immunizations), psychosocial considerations and anticipatory guidance and recommendations for future care. (www.bcchildrens.ca/transition-to-adult-care/Documents/MTSCARDIOTemplateDec2015.pdf)
- Transition Care Management Plan (TCMP): Developed with the support of the SSC, the TCMP helps community care providers understand the care requirements of patients with CHD. The TCMP consists of background information (purpose, brief description of lesion and management, recommendations for use of the plan) and delineates the role of the primary care physician and adult CHD specialist. It outlines the potential risks associated with the specific lesion, health surveillance and clinical evaluation recommendations, sexual and reproductive health considerations, and noncardiac surgery and procedures. The TCMP also outlines patient counseling recommendations for medications, exercise, and lifestyle considerations. TCMPs will be available online beginning November 2016. The TCMP website will contain the template and tips on how to develop a plan. These materials will be posted on the ON TRAC website in the health care provider toolkit.
- ON TRAC website: The website provides access to toolkits for youth, families, and health care providers. The youth toolkit helps patients develop the skills and obtain the support required for an effective transition into adulthood and the adult health care system. With the help of videos, self-directed activities, and other resources, youth can develop self-advocacy and self-management skills, obtain peer support, engage in educational, vocational, and financial planning, and learn more about sexual health and healthy lifestyle choices. The family toolkit helps family members provide guidance regarding additional support for housing, fi-

nances, personal care, and guardianship. The health care provider toolkit includes templates, guidelines, and resources to assist those supporting youth through the transition process. (www.ontracbc.ca)

iHeartChange

The website iHeartChange (https://iheartchange.org) is a CHD-specific, empirically studied Internet resource developed for youth, families and friends, and health care providers. The website provides introductions to adult care teams in many North American communities, medical and lifestyle information, and suggestions for becoming independent and coping with CHD. Users must create an account to access the site, but there is no cost or restriction otherwise. Youth can earn a Transition Diploma by visiting the various sections of the site and answering questions about living with CHD.[11]

Primary care considerations

The primary care physician plays an essential role in the transition and transfer process. Children and youth who are not well connected to a primary care physician may not develop an effective relationship with the health care system as young adults.[12] Given the centralized nature of subspecialty care, young adult CHD patients may also not learn about the resources available in their home communities.[13] In addition, concerns have been raised by general internal medicine specialists regarding inadequate exposure and knowledge regarding children with complex pediatric disorders and the unique health and psychosocial aspects of these adolescents and young adults.[14]

Young adults who have a strong relationship with a community physician are more likely to have a successful transition to adult care and to receive appropriate health maintenance advice and ongoing care regarding the following primary care considerations.

Surveillance, screening, and counseling

Patients with CHD and acquired valvular heart disease are at risk for infective endocarditis and may require antibiotic prophylaxis.[15] As well as being considered for appropriate antibiotic prophylaxis, patients should be screened for acquired cardiac risk factors such as hypertension and hypercholesterolemia, and counseled regarding nutrition and the use of tobacco, marijuana, alcohol, and drugs. Lifestyle choices such as body piercing and tattoos should also be discussed.

Sexual and reproductive health

Discussion may be needed about concerns regarding body image that can affect a young patient's self-esteem and have an impact on sexuality and sexual choices. The risk of having a child with CHD should be reviewed with both men and women, and fetal echocardiography should be offered to all prospective parents. Specific issues regarding contraception and pregnancy must be discussed with women. Most women with CHD have no limits on contraceptive choice, and counseling can focus on efficacy and individual needs. The exception is women with an increased thrombosis risk in which the use of combined estrogen/progestin oral contraceptives should be avoided. This group can use progestin (only) agents, such as oral or implanted agents.

Preconception counseling to review the potential risks and safety of a pregnancy may be organized with the Cardiac Obstetrics (COB) clinic at St. Paul's Hospital.

Sports and physical activity participation

The vast majority of youth and young adults with CHD can participate in physical activity and sport with minimal restrictions. Exercise recommendations outlined by the congenital cardiologist should be supported by the primary care provider.

Psychosocial health

Health care providers may fail to detect psychosocial distress if they do not ask about it or deliberately screen for it as part of routine care. The most straightforward way is to ask patients about specific challenges or difficult feelings that they may be experiencing in daily life, and to provide appropriate mental health referrals when needed. In North America, approximately 1 in 3 adults with CHD have clinical levels of depression and anxiety,[16-19] even when these patients are assumed to be well adjusted by their cardiologists.[16] Regardless of formal psychiatric status, many adults with CHD face potential psychosocial challenges as a result of growing up with a complex health condition. Common challenges include disease management, intrapersonal and emotional issues, impaired social functioning, educational and vocational difficulties, and poor health behaviors.[20-23] It is unclear whether psychosocial functioning is worst among patients with more complex CHD.[23] A number of factors[24,25] may contribute to lower psychological functioning:

- Female sex.
- Low capacity for exercise.
- Restrictions placed by physician.
- Body image concerns/perception of scarring.
- Perceived health status.
- Loneliness/social anxiety/fear of negative evaluation/poor social support/poor social problem-solving abilities.

- Poor academic performance.
- Perceived financial strain.

Many patients with CHD report feeling "different," and the therapeutic relationship may improve if both patients and providers view themselves as partners of equal status in the health care process. There are a number of excellent review papers about common psychosocial issues in CHD for the interested reader.[23,25-27]

Referring patients to the PACH clinic

Patients age 18 and older with moderate and severe congenital heart disease (**Table**) should be referred to the PACH clinic (see **Box** for contact information). Patients with simple disease may benefit from visiting the clinic once to confirm that their diagnoses are correct. Patients with simple disease may also visit the clinic under special circumstances such as during pregnancy, or to obtain advice on treating complications such as arrhythmias.

Patients with an urgent referral can be seen within days. For nonurgent referrals, the wait time is approximately 3 to 4 months. Before an appointment is booked, the clinic obtains all previous cardiac catheterization and cardiac surgical reports. Each patient is unique and surgical repairs may have been modified. Reports from previous consultations and procedures (pediatric cardiology, cardiac surgery, and adult cardiology) are helpful, as are imaging reports. The clinic orders appropriate investigations prior to the patient's clinic appointment, usually on the same day for patients from outside the Lower Mainland, so that a comprehensive assessment can be provided at the time of the consultation.

Summary

Approximately 12 000 adults with moderate and severe congenital heart disease live in British Columbia. Pediatric patients with CHD are followed through the Children's Heart Centre at BCCH and are transferred to the PACH program at St. Paul's Hospital at age 18. To accommodate the growing population of adults with CHD, a closer-to-home care model is being explored as a way to bring adult congenital cardiology services to additional communities throughout BC.

A successful transition and transfer from pediatric to adult care supports youth attachment to a primary care provider and ensures that continuity of care is maintained. Resources that aid in transition and transfer include toolkits developed for the ON TRAC initiative and the iHeartChange website.

Primary care considerations include surveillance and screening, sexual and reproductive health, and psychosocial health. Patients with moderate and severe CHD should be followed by the multidisciplinary team at the PACH clinic, while those with simple disease may benefit from visiting the clinic once to confirm that their diagnoses are correct.

The population of adults with CHD is growing and aging. The success of pediatric care providers in achieving excellent survival outcomes for young patients requires that we maintain the momentum

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Table. Congenital heart defects by severity.

Simple	Moderate	Severe
• Isolated congenital valve disease • Small, isolated atrial or ventricular septal defect • Repaired atrial or ventricular septal defect • Repaired patent ductus arteriosus	• Atrioventricular canal defect • Anomalous pulmonary veins • Coarctation of the aorta • Ebstein anomaly • Ostium primum atrial septal defect • Sinus venosus atrial septal defect • Patent ductus arteriosus not closed • Right ventricular outflow tract obstruction • Moderate to severe pulmonary stenosis or insufficiency • Subvascular or supravalvular aortic stenosis • Tetralogy of Fallot • Ventricular septal defect with associated defects	• Obstructed conduit • Cyanotic heart disease • Double outlet right ventricle • Eisenmenger syndrome • Fontan procedure complication • Single-ventricle defect • Transposition of the great arteries • Truncus arteriosus • Isomerism • Heterotaxy syndrome

and ensure that adult CHD patients receive the quality and continuity of care they need.

Competing interests
None declared.

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in memoriam

Dr James Holmes 1934–2016

It is with great sadness that we announce the passing of Dr Jim Holmes on 3 June 2016.

I am deeply honored to have been asked by his family to write a few words about my very good friend and colleague.

Jim leaves behind his best friend and bride of 55 years, Dixie; his daughters Lisa (Brian), Shelley (Ron), and Jackie (Mark); his son, Robert (Theresa); and a brood of 10 grandchildren who all adored him.

First and foremost Jim was a Prairie boy, and you could take the boy from the Prairies but you could never take the Prairies away from the boy. Jim was born 82 years ago in Consort, Alberta, population 700 souls and home to two famous personages: Jim Holmes and singer k.d. lang. Following his formative years in Consort, the family moved to Mirror, Alberta. During his teen years Jim worked as a fireman on the steam engines of the day. He also became an accomplished baseball player, and it is rumored that he was scouted by one of the big American League teams.

Undergraduate studies were at the University of Alberta, and then medical school followed by postgraduate studies in internal medicine at the Montreal General Hospital, and an exchange in Charlotte, North Carolina, and the famous Hammersmith Hospital in London, England.

These studies came to an untimely halt when Jim's brother, Jack was tragically killed in an air crash and Jim and Dixie returned to Canada to complete his fellowship at the University of Alberta Hospital in Edmonton.

Jim and Dixie moved to Kelowna in 1965 and he practised internal medicine at what was then known as the Knox Clinic. My wife, Bitten, and I came to Kelowna 1 year prior to Jim's arrival and our friendship developed quickly. This friendship was cemented by nearly 45 years of annual bird hunting trips to the Prairies for the four of us. Jim was in his element on these trips and many were our exploits. He was a fan of W.O. Mitchell and his book *Who Has Seen the Wind*, and he always delighted in showing us the wind. While ranging across the Prairies, Jim would bring the vehicle to a screeching stop and we would all hop out and actually look at the wind. Not at the grass and trees but, when the light was right, you could actually see the wind! This will stay with me forever.

I would now like to review for you the advances in medicine made at our Kelowna General Hospital thanks to Dr Jim Holmes. Jim started the first respiratory service in our hospital and introduced the I.C.U. and Emergency Department to the Bird respirator, which was cutting edge at the time. This was followed some years later by Jim introducing our hospital's first dialysis program using peritoneal dialysis. This is now a full hemodialysis program. Jim then established the first cancer clinic in Kelowna and the Interior. He got the first chemotherapy program developed and indeed was our very first oncologist in Kelowna. He then worked incredibly hard to get our full-service cancer clinic to where it is today. This legacy will be hard to match indeed!

Jim will be sorely missed by his friends and colleagues, and our thoughts and best wishes are with his wife, Dixie, and their family.

—Jim Tisdale, MD
Kelowna

Dr G. Barrie Purves 1942–2016

Dr Barrie Purves died 11 March 2016 from complications of multiple myeloma for which he had been successfully treated for nearly 14 years. He is survived by this wife, Sherrill Purves; three daughters; and four grandchildren.

Dr Purves graduated from the University of Saskatchewan in 1967 and, after interning at Chicago Cook County Hospital, moved to BC to do his residency in neurosurgery at Vancouver General Hospital/UBC Hospital, which he completed in 1975. Dr Purves was active on the committee that negotiated the first PARI contract for UBC residents. He then joined Dr Brian Hunt at Lions Gate Hospital and together they built a busy practice in North Vancouver, which extended to include Burnaby with active privileges at Burnaby General Hospital. They maintained full coverage of these services with a 1-in-2 call for 12 years before they were joined by a third neurosurgeon. Dr Purves also found time to serve as head of the Department of Surgery at Lions Gate Hospital, then chief of staff at Lions Gate Hospital in the 1980s, and as the North Shore representative for Doc-

tors of BC from 1982–84.

In 1992, frustrated by the lack of resources to treat the neurosurgery patients in BC, Dr Purves left the province to join three neurosurgeons in a neurosurgery group in Sioux City, Iowa. He worked there at two hospitals (Mercy Medical Center and St. Luke's Medical Center) and then played an important role in establishing a Speciality Surgical Center in North Sioux City, South Dakota. His interpersonal skills were also critical for establishing a multidisciplinary group practice called the Center for Neurosciences and Spine. He retired from that practice in 2004 after 2 years of treatment for multiple myeloma.

Fortunately Dr Purves was able to enjoy another 12 years of pursuing his hobbies and friendships, which included a passion for good food and wine, travelling the world to see the wine-growing regions, teaching neurosurgery for 1 month for each of 3 years in Indonesia with the international group FIENS, hunting and building, and enjoying his grandchildren as they arrived.

Dr Purves is remembered by patients, friends, and family as a caring, competent, and compassionate man who enjoyed life with a twinkle in his eye, and who endured the trials of his medical treatments for many years with grace and fortitude.

—Sherrill Purves, MD
North Vancouver
—Brian Hunt, MD
North Vancouver

Dr John William Ibbott 1929–2016

The death of Dr Bill Ibbott on 26 May 2016 marks the end of a remarkable medico-political career. It is worth remembering that the weekend demanded a great deal of Dr Ibbott's otherwise private life with so many official board meetings held both provincially and nationally.

I served on many executive provincial and national boards with Dr Ibbott, and knew him well while he was president of the then-BCMA from 1975–76 and I from 1976–77 (and 1982–83). It was true that we were often in opposition to each other but this had some valuable political advantages. When we met with provincial health ministers we were able to use our most effective arguments and I do not remember Dr Ibbott ever using our political disagreements at such meetings. Dr Ibbott had a total devotion to high-quality health care for all Canadians. It will be for this that he will be remembered by so many of us, and we owe him gratitude for his lifetime commitment.

—William Jory, MD
London, UK

Recently deceased physicians

If a BC physician you knew well is recently deceased, consider submitting a piece for our "In Memoriam" section in the *BCMJ*. Include the deceased's dates of birth and death, full name and the name the deceased was best known by, key hospital and professional affiliations, relevant biographical data, and a high-resolution photo. Please limit your submission to a maximum of 500 words. Send the content and photo by e-mail to journal@doctorsofbc.ca.

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First-time traumatic anterior shoulder dislocations in young patients

Traumatic anterior shoulder dislocations are a relatively common injury, with an incidence rate near 24 per 100 000 person-years.[1] The injury is 2 to 5 times more common in males, with almost half occurring before the age of 30. Between 1990 and 2015, WorkSafeBC saw nearly 6000 shoulder dislocations, with 27.8% occurring in patients age 25 or younger. Surgery has often been reserved for cases of recurrence, but the literature suggests that young patients may benefit from primary surgical stabilization sooner rather than later.

The primary concern with shoulder dislocations in young patients—after acute management—is recurrence. Recurrence rates for young patients range from 54% to 100%.[2-14] The upper limit of what constitutes a "young patient" varies slightly from paper to paper, but it is usually considered to be between the ages of 20 and 25. Recurrence rates decrease as the patient ages; the older the patient, the lower the risk of recurrence—to the point where the recurrence rate is around 6% in patients over 40 years old.[4]

The concern with recurrence is twofold: increased risk of arthropathy, and bony loss necessitating a more invasive surgical stabilization procedure. Radiographic evaluation for degenerative changes at 25 years following initial injury found a prevalence rate of 56%, as compared to approximately 20% in the general population.[15] Shoulders with no recurrence were found to have less arthropathy than those that became stable over time or were persistently unstable. Patients whose shoulders were surgically stabilized had no difference in terms of moderate or severe degenerative changes compared to solitary dislocators.[15] The second recurrence concern, bony loss, involves both the glenoid and humeral head. Hill-Sach's lesions—a compression fracture of the posterosuperolateral humeral head—are estimated to occur in 40% to 90% of all primary dislocations and near 100% of recurrent dislocations.[16,17] Sufficient glenoid wear can necessitate a more invasive and complex bony procedure (such as a Latarjet), or can lead to failure of a soft-tissue procedure (such as a Bankart repair) if not recognized. Glenoid insufficiency has been reported in up to 40% of primary dislocations and up to 90% of patients with recurrent shoulder instability.[16,18,19] A quantitative study on glenoid bone loss found an exponential relationship between the degree of anterior glenoid flattening and the number of dislocations.[18]

Because of the high incidence of recurrence in young, first-time traumatic shoulder dislocators, as well as the detrimental effects of recurrence, there is a movement toward primary surgical stabilization. Studies have shown a marked reduction in the recurrence rate when this group of patients is treated with a primary repair compared to conservative management using immobilization techniques.[20-23] There is also evidence for surgically stabilized shoulders having a lower rate of arthropathy, as compared to shoulders with recurrent instability.[15,24] In fact, as mentioned earlier, a 25-year prospective study found stabilized shoulders to have no significant difference from solitary dislocations in terms of moderate/severe arthropathy, but had appreciably less than shoulders with recurrent instability.[15]

Historically primary traumatic anterior shoulder dislocations have been treated conservatively, and surgical stabilization has often been reserved for cases of recurrence. The data suggest that the cohort of young patients with high-demand activities or occupations may be better served with primary surgical stabilization. As such, patients under age 25 with a first-time traumatic shoulder dislocation should be referred to an orthopaedic shoulder specialist for a discussion regarding the risks and options. Patients under age 20 are the most likely to benefit from primary stabilization.

For further information or assistance

If you have questions or require assistance with a worker patient, especially one who is less than 25 years of age, with a traumatic anterior shoulder dislocation, please contact a medical advisor in your nearest WorkSafeBC office.

—Derek Smith, MD, FRCS(C)
WorkSafeBC Orthopaedic Specialist Advisor

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

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Long-term care facility visits (fee items 00114 and 00115)

The roll-out of the GPSC Residential Care Initiative represents a major advance in delivering high-quality care to residential care residents in British Columbia. One of the expectations of the initiative is the provision of proactive visits. However, recent audits have identified some issues with the following long-term care fee items (00114 and 00115).

This article is the opinion of the Patterns of Practice Committee and has not been peer reviewed by the BCMJ *Editorial Board. For further information contact Juanita Grant, audit and billing advisor, Physician and External Affairs, at 604 638-2829 or jgrant@doctorsofbc.ca.*

Common errors seen in audits

Fee item 00114 (one or multiple patients, per patient):

- Claims exceeding the maximum of one visit every 2 weeks. If the visits are beyond the limit of one every 2 weeks, a note stating the medical necessity is required.
- Billing out-of-office visits (not appropriate for day visits,* after hours only).
- Physician reviewing the chart and not seeing the patient. A face-to-face patient-doctor encounter must be made.

*The Preamble to the General Practice section of the *Doctors of BC Guide to Fees* states that out-of-office visit fees are applicable unless the circumstance of the service is specifically covered by the definition of fee item 00103, 00108, 13008, 00109, 00127, 00128, 13028, 00111, 00112, 00114, 00115, 00113, 00105, 00123, 13228, or one of the 01800 series.

Fee item 00115 (nursing home visit—one patient, when specially called):

- Visits appear to be on a set day or the physician's regular round day. The visit must take place within 24 hours of receiving the request from the nursing home.
- No evidence the physician was specially called. Documentation should include who called, the time called, and the medical necessity.

Refer to Preamble D.4.9. Long-Term-Care Institution Visits for more information.

—Keith J. White, MD
Chair, Patterns of Practice Committee

Three BC doctors awarded Order of BC

Three BC physicians were among the group of 16 civic leaders appointed to the Order of British Columbia, the province's highest honor. The Order of BC recognizes persons who have served with distinction and excelled in any field of endeavor to benefit the people of the province or elsewhere.

Dr Allen Eaves

Dr Eaves is a leukemia specialist and founder-owner of Vancouver's STEMCELL Technologies Inc., the largest biotechnology company in Canada. Dr Eaves also founded the Terry Fox Laboratory and was its director for 25 years, and served on the board and as chair of Mitacs—a nonprofit, national research organization.

Dr Peter K.K. Wong

Dr Wong is a community leader, businessman, philanthropist, and physician who serves a large number of patients with multicultural backgrounds in Vancouver. In addition to his medical practice, Dr Wong has been an advocate for strong trade relations with China, participating in a number of trade missions with all levels of government and serving as a special advisor to the Musqueam Nation for Asia-Pacific affairs.

Dr Eric M. Yoshida

Dr Yoshida is recognized for his clinical care and research excellence in liver disease. Formerly medical director of the BC Liver Transplant Program, Dr Yoshida's work enabled patients with hepatitis B to have successful liver transplants, and he established the first program in Canada to provide HIV patients with the right to be allowed liver transplantation. Dr Yoshida built a centre for excellence in liver disease that provides treatment, research, education, and collaboration with the medical community and the citizens of British Columbia, and created a clinical research centre in hepatitis and liver disease.

Congratulations, Drs Yoshida, Eaves and Wong.

Dr Michael Klein appointed to the Order of Canada

Dr Michael Klein has been appointed as a Member of the Order of Canada. Recognized for his sustained contributions to integrating family medicine and maternity care in Canada, Dr Klein is one of 113 recipients who earned the honor this year. Dr Klein fled to Canada in 1967 after refusing to serve as an officer in the US Army Medical Corps during the Vietnam War and became a family physician, pediatrician, leading researcher in maternity care, and emeritus professor in UBC's Department of Family Practice and Pediatrics. The Col-

Farewell to Dr Susan Haigh

After 22 years Dr Susan Haigh is leaving the *BCMJ* Editorial Board. Susan joined the Board in 1994, marking the first year it had more than one female member. Susan represented multiple constituencies during her time on the Editorial Board, including female physicians, medical specialists, regional urban practitioners, and (of course) endocrinologists. In doing so she always produced practical, sensitive, and commonsense opinions, and her presence at Board meetings will be greatly missed. Susan spoke and wrote eloquently on behalf of patients and office support staff, showing the kind of person she is.

We wish her well as she heads toward retirement, and we are all grateful to her for her many contributions. Hopefully she will soon have time to make her long-planned trip to rediscover her African roots!

—*BCMJ* Editorial Board

Welcome Dr Jeevyn Chahal

We would like to extend a warm welcome to Dr Jeevyn Chahal, the *BCMJ* Editorial Board's newest member. Dr Chahal joined the Board on 1 July 2016.

Born in Kamloops, Dr Chahal completed her BSc in pharmacology at UBC and her MD and CCFP at the University of Saskatchewan. Following graduation she moved back to Kamloops to run a busy solo family practice. Dr Chahal shares her home with three dogs, one cat, a baby girl, and her husband. She enjoys spending time with her and her husband's amazing families and wonderful friends, tending to her hobby farm—which includes chickens—pursuing photography, running, and hiking.

—*BCMJ* Editorial Board

lege of Family Physicians of Canada named him as one of the Top 20 Pioneers of Family Medicine Research in Canada for his research in childbirth and maternal health, and his work on routine episiotomies. His landmark episiotomy study, "Does episiotomy prevent perineal trauma and pelvic floor relaxation? First North American trial of episiotomy," was selected as one of the "ten most notable family medicine research studies in Canada" by the College of Family Physicians of Canada.

Congratulations, Dr Klein.

Reminder: Apply for 2016–17 benefits under the Parental Leave Program

Are you a physician practising medicine in British Columbia? Are you or your spouse having or adopting a baby or planning a pregnancy between 1 April 2016 and 31 March 2017?

If so, it is important to take advantage of the Parental Leave Program, one of the negotiated benefits administered by Doctors of BC. In addition to pregnancy benefits for female physicians, the program provides parental benefits for male physicians and adoptive parents. Benefits are payable for up to 17 weeks at the rate of 50% of eligible income up to a maximum of $1000 per week.

For more information or an application package, contact Lorie Lynch at 604 638-2882 or llynch@doctorsofbc.ca, or Ann Marie O'Driscoll at 604 638-2865 or aodriscoll@doctorsofbc.ca.

Did you know?

Within the last year family doctors have participated in more than 3400 PSP service offerings. To learn more about how the Practice Support Program's suite of services can help doctors build capacity in their practices, visit www.pspbc.ca.

Canadian Blood Services reduces restrictions for blood donation

Thousands more people may now be eligible to donate blood following recent changes to a number of Canadian Blood Services deferral policies and donor restrictions. The following notable changes are now in effect across Canada:

- The upper age limit for donating has been eliminated. Donors over the age of 71 no longer need to have their physician fill out an assessment form before donating blood.
- Donors who have a history of most cancers (e.g., breast cancer, thyroid cancer, prostate cancer) will be eligible to donate if they have been cancer free for 5 years. This change does not apply to those with a history of hematological cancers (e.g., lymphomas, leukemia, melanoma).
- Donors who have recently received most vaccines, such as a flu shot, will no longer need to wait 2 days before donating blood.
- Donors who were born in or lived in some African countries (Central African Republic, Chad, Congo, Equatorial Guinea, Gabon, Niger, and Nigeria) are now eligible to donate blood. HIV testing performed on blood donors can now detect HIV strains found in these countries.
- Geographic deferrals affecting Western Europe have been revised based on scientific evidence that indicates the risk of variant Creutzfeldt-Jakob disease has decreased since January 2008. Donors who spent 5 years or more in Western Europe since 1980 are deferred from donating blood, but Canadian Blood Services is now including an end date of 2007. Donors who reached the 5-year limit in Western Europe after 2007 will now be eligible to donate blood.

The complete policy changes are available at www.blood.ca/en/blood/recent-changes-donation-criteria.

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Doctors of BC 2017 awards: Seeking nominations

Doctors of BC is calling for nominations of members in good standing for either of the following 2017 awards.

Don B. Rix Award for Physician Leadership

Candidates for this award may have achieved distinction in areas such as:

- Supporting lifelong learning opportunities.
- Promoting excellence in medical education.
- Providing leadership for new initiatives both in business and clinical practice.
- Providing leadership and service to the general community or province either by direct support or through philanthropy.
- Building consensus among physicians and groups of physicians.

Doctors of BC Silver Medal of Service

Criteria for nominees include any of the following:

- Long and distinguished service to Doctors of BC
- Outstanding contributions to medicine or medical/political involvement in British Columbia or Canada.
- Outstanding contributions by a layperson to medicine or to the welfare of the people of British Columbia or Canada.

Closing date for nominations is 30 November 2016 at 11:59 p.m. For more information, visit www.doctorsofbc.ca/resource-centre/awards-scholarships.

doctors of bc

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New donors who have never been screened can book an appointment online at https://blood.ca/en/user/register, call 1-888-2DONATE, or visit a clinic.

First clinical guidelines in Canada for pain following spinal cord injury

Researchers at Lawson Health Research Institute in Ontario have developed clinical practice guidelines for managing neuropathic pain with patients who have experienced a spinal cord injury. The research team worked with care providers at Parkwood Institute, part of the St. Joseph's Health Care London family, and an international panel to address the unique challenges for managing pain during recovery and rehabilitation.

Dr Eldon Loh, Lawson researcher and physical medicine and rehabilitation specialist at St. Joseph's, and his team recognized that pain can be an overlooked part of a spinal cord injury and plays a major factor in the success of rehabilitation. The results of the 3-year process led to recommendations for screening and diagnosis, treatment, and models of care. Important clinical considerations accompany each recommendation. The research will inform new tools and resources for care providers and patients.

The new guidelines have been published in *Spinal Cord* and are available online at www.nature.com/sc/journal/v54/n1s/full/sc201688a.html.

The Ontario Neurotrauma Foundation and Rick Hansen Institute provided funding for the research study.

Doctors of BC Annual Report survey, winner

Congratulations to Dr Katharine McKeen of Victoria, winner of the Doctors of BC 2015–16 Annual Report survey contest. By completing a brief survey Dr McKeen was entered into the draw and won a free night at the Pan Pacific Vancouver, including breakfast for two in Oceans 999.

Seniors with undiagnosed hearing loss can become isolated

UBC Okanagan researchers examined the impact of undiagnosed or untreated hearing issues in seniors age 60 to 69. The study found that for every 10-decibel drop in hearing sensitivity, the odds of social isolation increased by 52%. Among the sample of seniors, a 10-decibel reduction of hearing sensitivity was also associated with cognitive declines equivalent to almost 4 years of chronological aging.

Lead author Dr Paul Mick is a physician and clinical assistant professor at UBC's Southern Medical Program. The study examined data collected between 1999 and 2010 by the National Health and Nutrition Examination Survey, a survey that samples 5000 people each year across the United States. The survey examined demographic, socioeconomic, dietary, and health-related issues. Dr Mick would like to expand his research to see if interventions such as a hearing screening program similar to what is done for young children could positively impact health outcomes for Canadian seniors.

The study, "Is hearing loss associated with poorer health in older adults who might benefit from hearing screening?" was published in the May/June 2016 issue of *Ear and Hearing*.

Depression screening tools not accurate for children and adolescents

According to new Canadian research, there is insufficient evidence to show that the various short questionnaires physicians use to ask about symptoms of depression in children and adolescents accurately screen 6- to 18-year-olds for the disease. Researchers believe this calls into question the use of these assessment tools for this group and raises worries about possible misdiagnosis of the disease in this age range.

To assess the quality of the screening tools that are currently being used to identify depression in children or adolescents, researchers carried out a search of the medical evidence looking for studies that put the screening tools to the test. They identified only 17 studies where the test results from the screening tools were compared with results from a diagnostic interview to determine if the children or adolescents in the study actually had depression.

Lead author Dr Michelle Roseman, who is affiliated with the Jewish General Hospital's Lady Davis Institute for Medical Research in Montreal, and colleagues then assessed the methodology and results of these 17 studies. They found that most of the studies were too small to make a valid determination about the accuracy of the screening tools and that the methods of most studies fell short of expected standards. They also found that there was inadequate evidence to recommend any single cutoff score for any of the questionnaires. (Patients scoring above a pre-defined cutoff score are considered likely to be depressed, whereas patients below the cutoff are not.)

Researchers suggest that, given the inaccuracy of the tools currently being used, some children could end up mislabeled as depressed, and that large, well-designed studies that present results across a range of cutoff scores are needed to properly assess the accuracy of depression screening tools in children.

The study, "Accuracy of depression screening tools to detect major depression in children and adolescents:

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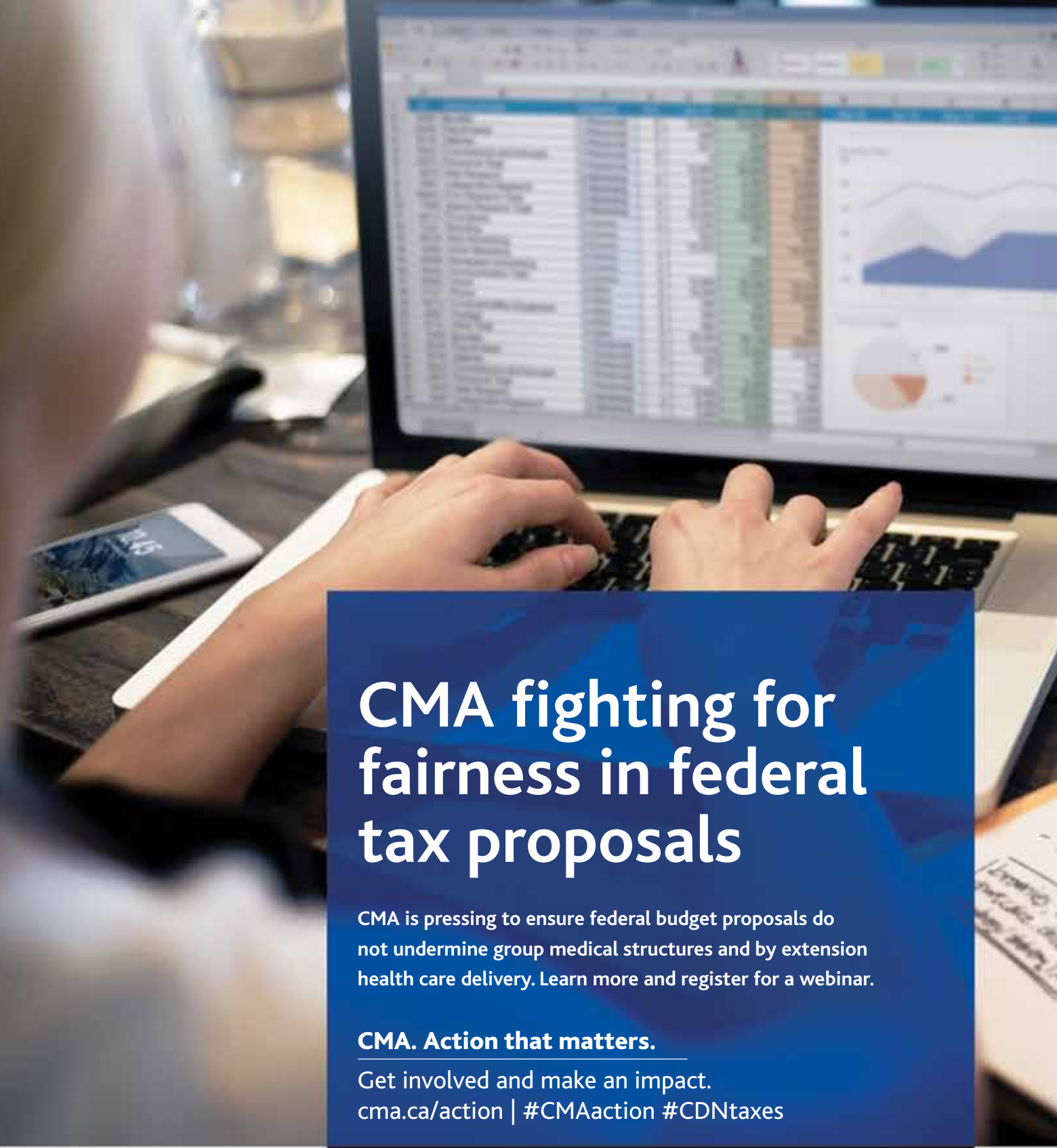

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A systematic review," is published in the May 2016 issue of the *Canadian Journal of Psychiatry*.

The research was supported by the Canadian Institutes of Health Research, the Arthritis Society, the Mach-Gaensslen Foundation of Canada, and a Murray R. Stalker Primary Care Research Bursary.

Middle-age memory decline a matter of changing focus

According to a study by McGill University researchers, the inability to remember details that begins in early midlife (the 40s) may be the result of a change in what information the brain focuses on during memory formation and retrieval, rather than a decline in brain function.

Senior author Natasha Rajah, director of the Brain Imaging Centre at McGill University's Douglas Institute and associate professor in McGill's Department of Psychiatry, identifies that a key question in current memory research concerns which changes to the aging brain are normal and which are not, and that most of the work on aging and memory has concentrated on understanding brain changes later in life. This research was aimed at addressing what happens at midlife in healthy aging and how this relates to findings in late life.

In the study, 112 healthy adults ranging in age from 19 to 76 years were shown a series of faces and were asked to recall where a particular face appeared on the screen (left or right) and when it appeared (least or most recently). Researchers then used functional MRI to analyze which parts of brain were activated during recall of these details.

Dr Rajah and colleagues found that young adults activated their visual cortex while successfully performing this task, while middle-aged and older adults didn't show the same level of visual cortex activation when they recalled the information. Instead, their medial prefrontal cortex was activated.

Even though middle-aged and older participants didn't perform as well as younger ones in this experiment, Dr Rajah suggests that it may be wrong to regard the response of the middle-aged and older brains as impairment, but rather that it may reflect changes in what adults deem important information as they age. Researchers also concluded that middle-aged and older adults might improve their recall abilities by learning to focus on external rather than internal information.

Dr Rajah is currently analyzing data from a similar study to discern if there are any gender differences in middle-aged brain function as it relates to memory, noting that women go through a lot of hormonal change at midlife. The question is, how much of these results is driven by post-menopausal women?

The study, "Changes in the modulation of brain activity during context encoding vs. context retrieval across the adult lifespan," was published in the October 2016 issue of *NeuroImage*.

This research was supported by the Canadian Institutes of Health Research and by a grant from the Alzheimer's Society of Canada.

Half of patients with depression are inadequately treated

UBC research shows that about 50% of British Columbians with depression are not receiving the basic level of care, and authors say the findings highlight the challenges of accessing mental health services across Canada.

It is estimated that 1 in 20 people experience depression each year. Joseph Puyat, a PhD candidate in UBC's School of Population and Public Health and a research methodologist at the Centre for Health

Evaluation and Outcome Sciences, and his colleagues reviewed health data from almost 110 000 British Columbians diagnosed with depression by physicians between 2010 and 2011, and examined whether these individuals received either one of the two recommended treatment options: antidepressants or psychotherapy. They found that only 13% of people received at least four psychotherapy or counseling sessions and 47% received antidepressant medication for at least 12 weeks. Overall, about 53% received the minimum threshold of treatment.

Researchers believe that their findings underestimate the full extent of the problem since many people do not seek or receive a diagnosis for their depression because of issues around stigma or access to a physician. Mr Puyat compared these findings to results from the Statistics Canada 2012 Canadian Community Health Survey and found that the BC data are comparable. In the national survey, 4 out of 10 Canadians who struggle with depression indicate they are not accessing any services to treat depression. He suggests that provinces need to look at the services covered for mental health and how patients access care (e.g., Canadians only receive public health coverage for counseling from medical doctors, yet many family physicians don't have the time or training to provide counseling services).

The study, "How often do individuals with major depression receive minimally adequate treatment? A population-based, data linkage study," was published in the July 2016 issue of the *Canadian Journal of Psychiatry*.

Scientists develop microneedle system to monitor drugs

Researchers at UBC and the Paul Scherrer Institut (PSI) in Switzerland have created a microneedle drug-monitoring system that could one day replace blood draws and improve patient comfort. The system consists of a small thin patch that is pressed against a patient's arm during medical treatment and measures drugs in the bloodstream painlessly without drawing any blood. The tiny needle-like projection, less than 0.5 mm long, resembles a hollow cone and doesn't pierce the skin like a standard hypodermic needle.

Researcher Sahan Ranamukhaarachchi, a PhD student and Vanier scholar in UBC's Faculties of Applied Science and Pharmaceutical Sciences, developed this technology during a research exchange at PSI. Microneedles are designed to puncture the outer layer of skin, but not the next layers of epidermis and the dermis, which house nerves, blood vessels, and active immune cells.

The microneedle created by Mr Ranamukhaarachchi and his colleagues was developed to monitor the antibiotic vancomycin, which is used to treat serious infections and is administered through an intravenous line. Patients taking the antibiotic undergo three to four blood draws per day and need to be closely monitored because vancomycin can cause life-threatening toxic side effects. Researchers discovered that they could use the fluid found just below the outer layer of skin, instead of blood, to monitor levels of vancomycin in the bloodstream. The microneedle collects less than a millionth of a millilitre of fluid, and a reaction occurs on the inside of the microneedle that researchers can detect using an optical sensor. This technique allows researchers to quickly determine the concentration of vancomycin.

The microneedle monitoring system is described in a paper published in the July 2016 issue of *Scientific Reports*, "Integrated hollow microneedle-optofluidic biosensor for therapeutic drug monitoring in sub-nanoliter volumes."

Correction: Dr Erik Paterson, 1941–2016

Dr Paterson's year of graduation from the University of Glasgow School of Medicine was incorrectly listed as 1960 in the In Memoriam piece published in the *BCMJ* [2016;58:319-320]. Dr Paterson graduated from medical school in 1966.

Canadian technology uses speech to track Alzheimer disease

A new technology that analyzes a person's natural speech to detect and monitor Alzheimer disease and other cognitive disorders won the AGE-WELL Pitch Competition: Technology to Support People with Dementia. The tablet-based assessment tool records short samples of a person's speech as they describe a picture on the screen and extracts hundreds of variables from the samples.

Because of word-finding difficulties, people with Alzheimer disease will tend to pause more between words and the complexity of their vocabulary is reduced. The technology uses artificial intelligence to analyze about 400 variables, such as pitch, tone, prosody (rhythm), and rate of speech, as well as pauses and choice of words. In the laboratory, the software can reliably identify Alzheimer disease, Parkinson disease, and aphasia with between 85% and 100% accuracy.

Researchers are set to begin field tests in assisted living and home care settings. The tool will be used in seniors' facilities to improve ongoing monitoring of residents' cognitive health, provide family members with quantifiable updates, and help people plan when it's time to transition to a higher level of care.

Liam Kaufman, CEO and co-founder of Winterlight Labs, developed the tool with Dr Frank Rudzicz, Maria Yancheva, and Katie Fraser of the University of Toronto. Dr

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Influenza vaccine in pregnancy: Is it safe?

Influenza vaccine has been administered to pregnant women since the 1950s, initially to those with high-risk medical conditions such as chronic heart or lung disease and later to health care workers. Since the 1990s, use in pregnancy has been expanded more broadly in many countries in recognition of the risk of influenza-related complications and benefits to both mother and infant, with even higher rates of use in pregnancy during the 2009 A/H1N1 pandemic because of severity of the infection in pregnancy. In the United States, influenza vaccine coverage in pregnant women has exceeded 50% since the 2009–10 season,[1] and while seasonal uptake data in pregnancy are not available in Canada, coverage among pregnant women in BC during the 2009 pandemic A/H1N1 campaign was 54%.

Inactivated influenza vaccine is recommended for all pregnant women at any stage of pregnancy during the influenza season, typically from November through April each year.[2,3] Benefits include maternal protection against influenza-associated morbidity, including hospitalization for cardiopulmonary complications, the rate of which progressively increases with duration of the pregnancy and is maximal in the third trimester. Maternal immunization is also associated with reduced risk of influenza and associated hospitalization of the infant, and infants born to vaccinated women have lower rates of prematurity, low birth weight, and being small for their gestational age.[4] Protection of the infant occurs through two mechanisms: directly through passive transfer of humoral immunity from the mother in utero, and indirectly through cocooning by immunization of close household contacts and caregivers. Direct protection by infant vaccination is not achievable with current vaccines prior to 6 months of age.

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

Inactivated influenza vaccine is recommended for all pregnant women at any stage of pregnancy during the influenza season, typically from November through April each year.

Historically, both drugs and vaccines have been used sparingly in pregnancy. Avoidance of vaccines has been largely based on theoretical concerns about teratogenicity of live vaccines such as rubella and varicella, which have not been borne out. A secondary consideration for avoiding vaccines has been that an anomaly will be misattributed to vaccine, especially if received in the first trimester. Influenza vaccination during pregnancy is associated with a brief increase in maternal inflammatory biomarkers, but this response is not associated with fetal development and risk of congenital anomalies.[5] At its June 2013 meeting, the World Health Organization Global Advisory Committee on Vaccine Safety concluded from their review of vaccine safety in pregnancy that there is no evidence of adverse pregnancy outcomes from vaccination in pregnancy with inactivated virus (including influenza), bacterial, or toxoid vaccines.[6,7]

The historical precautionary approach to use of vaccines in pregnancy and over two decades of recommendations for influenza vaccination in pregnancy mean that much of the data on influenza vaccine safety in pregnancy originate from observational studies, including database reviews and postmarketing surveillance, instead of randomized trials; nevertheless, these have concluded that influenza vaccine is safe during pregnancy, including multidose products containing thimerosal as a preservative.[8-10] Additionally, many more recent studies have been conducted and several reviews of the literature have been published since 2009, assessing both 2009 pandemic A/H1N1 and seasonal inactivated influenza vaccines. These studies and reviews have examined the occurrence of preterm birth, fetal death, stillbirth, spontaneous abortion, and congenital malformations.[11-13] These reviews have found an overall lack of association between influenza vaccine receipt and adverse pregnancy outcomes, and physicians can confidently reassure pregnant women about safety of influenza vaccines in pregnancy. Review authors commented on the need to define standards for future studies of vaccine safety in pregnancy to ensure consistently defined end points; for instance, fetal death was variably defined in studies at gestations ranging from over 12 to over 25 weeks or over 500 grams. To this end the US National Institutes of Health convened an international consensus conference on harmonized safety monitoring of immunization in pregnancy in late March 2016. Development of standards should pave the way for more consistent reporting of results from future studies, including pooling of results for meta-analyses. This is increasingly important because of

greater future use of vaccines in pregnancy beyond influenza, including for prevention of pertussis, group B streptococcal disease, and respiratory syncytial virus infections.

—Monika Naus, MD, MHSc, FRCPC
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Rudzicz is also a scientist at Toronto Rehab-University Health Network. Regulatory approval will be sought in Canada and the United States to make the technology available to family doctors and speech-language pathologists.

Ten teams from Canada and around the world competed in the AGE-WELL Pitch Competition, which showcased a variety of technology solutions that address the challenges faced by people living with dementia.

Doctors of BC Board Officers & Delegates 2016–17

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Q&A with Dr Alan Ruddiman: Doctors of BC President 2016–17

Photo: Lionel Trudel Photography Ltd.

Dr Ruddiman has practised full-service rural generalist medicine in the Okanagan Valley for the past 20 years. He lives and works in Oliver. *BCMJ* associate editor Joanne Jablkowski spoke with Dr Ruddiman 1 month into his presidency about his background, life experiences, and his ideas for the future of health care in BC. Here is a condensed version of their conversation.

By Joanne Jablkowski

Your parents are originally from Scotland. What took your family to South Africa when you were young?
It was opportunity. In the 1960s Britain was going through significant change and the shipbuilding industry in Scotland was starting to decline rapidly as the world was shifting to a global economy. My parents were a young couple at the time, with two boys—me and my younger brother—and they wondered what opportunities would be available for young men in the country if the main industry was starting to tank. At the same time the colonies were advertising for talent from Great Britain—places like Canada, South Africa, New Zealand, Australia had very active embassies in the UK at that time, recruiting people to bring their talent, come overseas, build a new life—and my parents saw opportunity in that.

What ended up selling them on South Africa was that the embassy staff did a really good job promoting the fact that if you came to South Africa as a young immigrant couple and were hardworking there was no ceiling to what you could achieve.

We were very privileged to move to South Africa while the country was going through some transformative and difficult changes, and to have been part of that history and change was phenomenal.

How do you think that environment shaped your interests?
When we arrived in the late 1960s there was a one-party state in the country, and the ruling government had been in power since 1948. So, having come from a country where you could promote yourself based on your skills and abilities, in South Africa one was very confronted by the class system, part of the colonial legacy.

My parents raised us to recognize that we were going to be confronted by apartheid, but to be careful where we raised questions, explaining that everything was not as it appeared. We had access to a wonderful educational system, and I have to say that in the ’60s, ’70s, and ’80s, South Africa probably offered its citizens one of the most reliable and complex education systems in the world, even

though there was a significant disparity in who had access to education at that time.

After high school I selected a university where race was not considered as an access point, and Wits University prided itself on challenging the government that there needed to be freedom of access to postsecondary education. That was a wonderful breeding ground for my activism and formed the qualities that framed my leadership profile.

After you earned your medical degree in South Africa in the 1980s, what prompted your move to Canada?

Most people will probably anticipate that I chose to move because of the challenging political situation. It wasn't that; it was the challenging economy. Interest rates were phenomenally high. When I graduated from medical school the interest rate on a credit card was something like 32% per annum. Interest rates on a mortgage were in the double digits. And I had a sizable student loan—I came from a blue collar working family, so my family didn't finance my education. My dad co-signed my student loan and I accumulated that debt through 6 years of medical school and then through my internship and residency, so I was really motivated to clear my debt before I decided what my medical career was going to look like.

Speaking to others, Canada seemed very welcoming to South African–trained physicians and other international medical graduates, and it didn't take long before I found a locum opportunity on the Prairies. The idea was to earn enough within 6 to 12 months that I could clear my student debt and decide what my medical career would look like after that.

Do you have a memory from your first days in Canada that made an imprint on your professional direction?

When I started practising in Moose Jaw, Saskatchewan, even as a new entrant to Canada who could speak the language and was pretty well versed on the culture, I was confronted by how different medicine appeared to be. In South Africa people would arrive at hospitals or community clinics with sometimes very pressing health issues; the disease processes were sometimes very advanced. We were faced with the whole spectrum of what medicine could present to young doctors.

In my Canadian community clinic I didn't see that same spectrum of nasty diseases. There were more nuances to medicine here. People presented much earlier in the context of their illness. The person sitting across from me in the clinic would often look very, very well, as opposed to the sick, ill, and injured people that I had seen as part of my training in South Africa.

You have two daughters who are now developing their own career paths. What advice do you give them about how they should shape their futures?

We traveled a lot with the girls when they were young and we've given them, I hope, a broad global perspective on how small this planet really is, how closely connected we are as human beings, and that we can all serve in different ways. We didn't raise either of our daughters to consider medicine or teaching, which is my wife's profession, as being the only two ways of serving society and having social accountability. And it shows in their behaviors. They value service; they're connected to society. My youngest daughter is definitely the most environmentally responsible person in our family. I think we've done a really good job in allowing our girls to embrace diverse thought.

We look forward to seeing what careers they will choose. They have unique personalities and are going in different directions—our oldest is working in hospitality and the hotel industry, and our youngest is doing a science degree at UBC at the Okanagan campus.

What is the best advice you were ever given?

My dad was a wonderful mentor. He left school at 16 with a grade 10 education and he said to me on many occasions, "Alan, in knowledge there is power." He also provided me with an appreciation that talent comes through hard work and application—thousands of hours spent doing the same thing produces expertise.

Tell me about your life in Oliver. How do you like to spend your time?

It's very busy, but balanced. Having grown up in a family that valued the outdoors, I've always embraced experiencing what the world can give us. Not all rewards have to be monetary. We were an outdoor family—in South Africa it's called caravanning, here it's RVing—and when looking at where I'd like to live and work in Canada, the Interior of BC, and particularly the South Okanagan, most closely represented the climate and geography that I was familiar with from my childhood.

Also, because I trained at a generalist hospital—even though I had aspirations when I was younger to specialize in internal medicine or anesthesia—when I came to Canada I embraced rural life and I felt I could contribute more by living and working in a rural community than I could in an urban or metropolitan community. I think service is really important—caring about your neighbor, caring about the health of your community, not just one patient at a time as a family doctor or specialist might encounter in their practice, but thinking beyond that and being curious about what can make your community more vibrant.

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If I can look back on my career one day and say that my community is more vibrant because of my presence and the influence I've had, then I'll be a very happy professional when I retire.

As an avid sailor, what is your dream sailing trip?

We've lived the dream. Since the girls were very young Christina and I talked about taking a year off for a sabbatical, and when our girls were 14 and 16 we did it.

With a lot of thoughtful planning, we bought a boat in Florida and sailed for a year—down the East Coast of Florida, we crossed the Gulf Stream of the Atlantic (some of the most difficult waters for sailors to cross because the weather can be really unexpected), and then we landed in the Bahamas. There are 600 to 800 islands in the Bahamas, and when you get out to the outlying islands you start to experience what living and working in the Caribbean can be like.

We lived aboard the boat for a year. The girls were excellent crew members. And the fact that we could all take responsibility for one another's well-being and safety and the wholesomeness of what we were doing was fantastic. Whether it's for 3 months or a year, I encourage all my colleagues to consider taking a sabbatical. It's energizing to disconnect from the day-to-day routines that put such significant demands on us. You get a chance to reflect on where you are in your career, your professionalism, to consider if you are serving in the way that you were attracted to medicine to be able to do, what parts of your career you are finding rewarding, what the challenging areas are. It was a really good introspective year. As a mid-career physician, I could reflect on what I would like to do moving forward, and to identify what was truly important to me and what else could I do to support society.

What life lessons stand out to you from traveling with your family?

We've tried to raise our girls to appreciate that we live in a society that is based on consumerism, in the first world, and whether it's the consumption of information or the overconsumption of food, or having to keep up with the Joneses and have the best, those shouldn't be values that drive us to feel that we've lived a complete life. The bigger question we should all be asking is, when I look back, am I going to know that I left the world in a better place than when I entered it?

My measure of a satisfying life is the answer to, have I valued the people I have relationships with, and do they value me? I think you've truly lived when you're no longer anonymous, when you have a connectivity within your community, and when you're recognized for your work and your efforts.

Do you have any other interests that could have swayed you to follow a career path other than medicine?

My father had a strong and profound influence on me. Those who know me know I love telling a good story, I love debate, and I love being provocative in terms of questioning the conventional ways of doing things or the traditional values and views that society holds.

I also have a few health issues, one of which is that I was born with a lazy eye, or strabismus, which was corrected through surgery when I was young, but I've been challenged with my vision in the affected eye. In my high school it was expected that you participate in sporting activities, and the way that you demonstrated your sporting prowess at a boys-only high school was to play something like rugby or cricket. And I wanted to pursue that, but because of my eye disability my dad suggested I think about other activities. He knew that getting hurt and damaging my good eye could be problematic and pointed me toward debating. I was never a good public speaker, it was certainly one of my phobias in high school, and my dad recognized that to be a confident person you have to be able to share your views and opinions.

I considered law as a career in high school as well. Though because the legal system is based on Dutch Roman law in South Africa, my dad saw that as being limiting if I ever wanted to work in other jurisdictions, and we had many good evenings bantering about what life could look like and what a career could look like. And it was at that point that I started to reflect more on my mother's values—she was a registered nurse. In talking to my mum, and recognizing there were a few doctors in our family lineage, I started to think more about medicine as a way of defining who I was as a professional. And boy has it ever turned out well.

So that explains how you acquired your interest in medicine, or is there more to that story?

It goes further back than that. I often think about whether medicine selects the individual, or whether the individual selects medicine.

When I was in elementary school my very best friend's father was the principal, so I really admired the family. My friend James and I did everything together, and when he declared early on that he wanted to be a doctor I thought, you know what, James wants to be a doctor, I'll be a doctor too, that will be a great thing to do. And that stuck in my brain.

While I was debating what my life would look like with my father, that thought reoccurred, and I decided to stick with what I had originally signed up to do. In the end, James became a teacher, like his father, and I became the doctor.

I think most doctors have such a defining moment in their life—an experience as a child, or a circum-

stance where the idea of medicine as a potential future career shows up, a moment from which their desire to want to help others stems.

Do you have any professional heroes?

They shift and change throughout life. One of my early heroes in medicine was my professor of anatomy at the University of Witwatersrand, Phillip Tobias. He was also a palaeoanthropologist, and I remember one of the defining lectures he gave in medical school. He took us to a cave west of Johannesburg called the Sterkfontein Caves, where the earliest human hominids were discovered, and he stood there, lecturing to 240 young medical students while holding a skull in his hands. That vision is embedded in my brain. He had a very gentle voice, he was very well respected in South Africa and by the international medical community, and I thought, wow, if someone from our university can command that much respect, then I should really embrace my own career. It was a principle-defining moment for me.

Dr Anna Reid stands out for me in the context of Canadian health care. Dr Reid, who is a past president of the CMA, is a humble leader who has proven that women can put their footprint on service and leadership in medicine. And we need more women leaders in health care, both in BC and in Canada.

I look too to the Honourable Jane Philpott, our federal Minister of Health. She's got an incredibly powerful life story. She spent time practising medicine and doing volunteer work in Africa and, unfortunately, lost a young child to a treatable illness simply because there weren't enough resources available locally when they were needed.

The other person whose career I've admired and who has been a fantastic mentor to me is Dr Granger Avery. Granger welcomed me into rural health care leadership in BC and has been foundational in creating the space for my voice to come forward for the entire profession in BC. As a true friend, Granger has taught me to lead with a respect for all colleagues, specialists and GPs. The so-called divide between generalists and specialist shouldn't exist, and it's going to be one of my challenges this year to see if we can enhance the conversation about uniting the medical profession in BC.

We have a huge opportunity to seek system improvements in BC this year. We are hosting the CMA General Council, where Dr Avery is to be inducted as the national president, our own association has a strong provincial voice, and the federal Minister of Health is also a doctor. This is an excellent chance for the association to invest its energies in being part of a national conversation.

Can you tell me about a pivotal time in your career?

On one Sunday morning in 2002 I was the emergency department doctor at my local rural community hospital in Oliver, and I was Doctor of the Day, so I was covering all the patients in hospital on behalf of my colleagues who had the weekend off. There was a page over the hospital intercom—"Dr Ruddiman to the emergency department, stat!" I gave up my duties at the

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Photo: Lionel Trudel Photography Ltd.

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nursing station, ran down the hall, and ran into my wife. As soon as I saw her I thought, on no, there's something wrong with one of our daughters, I'm the emergency doctor, this is going to be horrible. And she said, "Alan, I want you to take a big breath. Your dad has come into the emergency department with crushing chest pains." I think to administer one's skills to a member of your community is already sometimes not at arm's length—you know a lot of the people socially, your kids play together—but to be called upon to administer care to your father when he's having a heart attack, for me, that helped shape where I needed to provide advocacy. We need the right resources across all of our communities across BC—metropolitan, rural, urban, and remote.

I activated all the protocols I would for any other patient, but to have to deliver emergency medical care to my father was a sobering reminder that if I hadn't embraced all the generalist pieces of being a family doctor my dad may not have had an opportunity that day to receive the best care. I'm fortunate to have had a great team—all the nurses were phenomenal—and I called a colleague in as soon as could. I didn't want to be the person responsible for my dad's success or failure with his acute health crisis, but I'm sure glad that I was trained to administer the care that he needed while I got the rest of the team together.

There are communities across the province where patients present every day with pressing medical needs, and to not have skilled professionals in those communities to deliver care to those people when they need it would simply be underservicing British Columbia.

How has your role as a general practitioner evolved since you started practising?

What's evolved is a deeper understanding for the social determinants of health. It's not always about health care. I think health care is only responsible for about a quarter of what makes people sick. A bigger component is the life that people have—where they live, what level of income they have, what kind of education they have, the early childhood development they were exposed to, whether they live with a disability. Of course, whether you have access to health care and whether you have acute or chronic illness is really important, but genetics also comes into play. Did you inherit good genes from your parents?

The other piece that I'm becoming more aware of is the damage that's being done to our planet and the related health issues. We have a huge responsibility as doctors to exercise our professional voice on issues of social determinants of health. The Council on Health Promotion has done stellar work over the years to highlight areas where doctors can advocate for social changes that can produce health. It shouldn't just be about managing sickness.

Have your patients' expectations changed as well?

The family practice I inherited almost 20 years ago was from a doctor who had been the family doctor for these patients for 20 to 30 years, so the average patient was in their early- to mid-60s. Jumping forward 20 years, my latest practice profile tells me that my average patient is now 76 years old. So I've got a 20-year relationship with people who have, for the most part, moved into the later part of their lives. When I have interviews with these patients I hear the most profound and provocative things because these people have lived sometimes very full lives, and their expectations and understanding of what it means to have a healthy life is very different from the opinion of someone who is 20. Elderly people are very clear on how they want their care delivered. They have very well-shaped ideas on what the health care system can do to support them. The one thing I've been delighted to have established in my practice is the opportunity to have conversations around end-of-life and advanced-care planning with my patients. Where we have pressure sometimes is from family members, children, grandchildren who don't embrace the values that elderly patients express about how they want to be cared for when they're confronted with an incurable disease or illness, or simply when they get to a place in life where they feel that they have reached the end.

That is a societal conversation we have to have. Instead of always deploying maximal resources and the most specialized care options, which may be futile, we should be asking, what can we do to support you to have the best quality of life at this point in your life? My elderly patients have helped and educated me to become an advocate in that regard.

Do you find that's a difficult shift for doctors?

I think we have to be careful in how we characterize medicine. A fulfilling medical career as a specialist or a general family physician isn't about saving all lives all the time, it's about making a fundamental difference in the life of the person sitting in front of you when they're confronted by acute or chronic illness. We shouldn't be in the business of simply focusing on saving lives, we should be focusing on making a difference in the lives of the people we encounter as part of this wonderful profession.

What do your patients think of your role as president?

I have developed relationships with my patients over the past 20 years—and many of them are now individuals who are closer to the end of their life than to the part of their life when they were most productive—so for me to be absent from my community

multiple times per week is quite challenging for them. I'm very fortunate to have a young female physician locum, a recent graduate from the UBC family medicine program, who embraces the same values that I do, is very professional, is a generalist physician, and has made a commitment to supporting me in my practice and my patients for the year. I feel reassured knowing there are colleagues like my locum who are willing to step up, though I do know there is angst within my patients about when I'm going to be in the office next. I'm back filling in my practice right now for when my locum is away and when there are other gaps in coverage to make sure I can continue to practise clinical medicine.

Could you tell me about a personal achievement that stands out for you?
There are many moments that have made me smile. Being recognized by your peers in a way that is uninvited, for example, is humbling—there are so many good doctors in this province who fly under the radar and aren't recognized for their contributions and service. We need to do more of that—recognize these contributions to medicine, to patients, to communities.

A number of years ago, I think it was 2008, I was recognized by the Society of Rural Physicians of Canada to be awarded a Fellowship of Rural and Remote Medicine in Canada. At that point I probably had arrived at a place where my career was evolving and I was starting to contribute beyond one patient at a time. To this day I wear the lapel-pin I was presented with as a reminder to myself of being recognized for serving well. And I think that is part of why we choose medicine—we have to embrace the tenants of professionalism, advocacy, and service.

Conversely, could you tell me about a challenge or regret?
Thinking back to when I was in university, and when South Africa was going through profound change, I feel a little disappointed and embarrassed that I didn't do more in terms of activism for change in the country. I was politically active, but I didn't do it in as brave a way as I probably could have concerning the social injustices that were occurring in the country. My parents raised us to question what appeared to be the real world—how law was applied, how a large portion of society was disadvantaged—and considering the empathy that was generated in our home I'm disappointed in myself when I think back.

Having taught Family Medicine R1 residents in their family medicine rotation, what is your impression of the challenges that medical students and residents face today?
They're coming into medicine at a time when so many changes are occurring—just the exponential growth in how we access and share information is unprecedented—and as exciting as that is it's also incredibly challenging because we need to filter what is factual, what is scientifically based. As doctors we pride ourselves on being the experts in medicine, and there are so many career opportunities available for young doctors, but we have to understand that the foundation of a general medical education is generalism. We also have to think about social accountability—there's a social contract that we have in Canada with the federal and provincial governments—we are responsible for giving back to society. To this end, we need to require from our universities and medical students as broad-based a generalist training in medical school as possible before they choose an area of specialty. There needs to be a strong foundation of generalism, both in specialty practice and family medicine.

What are your concerns about the future of family medicine in this province?
My biggest concern would be that we promote sub- and superspecialization as the only ways to derive satisfaction from a medical career. We're very privileged to gain a world-class, strong, scientific education in Canada, and we don't want to dilute that scientific capital by gaining a significant medical education and then streaming off into a superspecialized area. I don't think that serves society well. When it comes to serving individual patients, communities, regions of the province I think it's the generalism in medicine that needs to be promoted as the primary way that we invest our energies as taxpayers and as society looking after the health care needs of our populations.

What health care issue do you think is not getting enough attention right now?
We've recently seen the formation of the First Nations Health Authority, and I think we have a lot to do surrounding Aboriginal health in BC. We don't give it enough attention, and we have to build that into the social fabric. We need to be culturally sensitive. We need to respect the custodianship that First Nations in our province have for being responsible to the planet. They are leaps and bounds ahead of where we are in understanding that if we don't look after our planet, it won't look after us. We can do better in terms of building relationships with our First Nations partners across health care and beyond.

The other piece that deserves ongoing attention is simply bringing specialists and generalists back together as a united profession so we can tackle these tough issues.

What technological developments in medicine are you excited about?
One of the greatest investments that governments and societies can make in health care is around how we choose to organize, fund, and support

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activities around information technology and information management. Having a patient medical record that is dynamic, current, accurate, and that truly reflects the health of a patient will go a long way to reducing unnecessary health care costs and the burden of medical errors, and ensuring safely delivering care to patients. We need to look at how we integrate information technology effectively to reduce the duplication and multiple layers of barriers that we have by trying to accommodate 6, 8, 10 different information technology delivery systems.

I hear citations of privacy as the issue that's limiting us from removing various IT barriers, but if you ask patients if privacy is the biggest issue for them, they'll say absolutely not, it's about access. They want health care providers to have their most current medical information in front of them when they're being asked to be partners in their own health care. If we can't deliver that, we're doomed to fail in health care in 2016.

You are also highly engaged on Twitter. How has social media affected your practice and your interactions with your patients and colleagues?

We have a responsibility as a profession to engage with one another, and social media is a huge opportunity to share our voice and express our opinions with the public and with government. I encourage my colleagues to look at social media as a way to get their professional voice out there, to talk about their concerns. It has helped my career in cutting through red tape—being able to reach leaders who I might otherwise not have traditional relationships with.

You've spoken about the importance of collaborative efforts between all health care providers and partners. What specific improvements or opportunities do you think greater collaboration will result in that are currently underdeveloped?

When we talk about team-based care we need to understand who all the partners are who are responsible for producing outcomes. The doctor-patient relationship is fundamental. It is the most-valued relationship in health care, so we can't undo that. There has to be a strong physician voice, and a credible and safe place for the patient voice to land. But we also need to recognize who the other partners in health care are. We certainly look to the provincial government for its leadership and we look to the societies that support family physicians and specialists. We need to bring those voices together and to work with allied health care professionals, our nursing colleagues, our pharmacy colleagues, licensed practical nurses, social workers, physiotherapists, the list goes on. We need to bring the right providers together and have meaningful conversations about delivering timely and efficient care to patients, reducing unnecessary admissions to hospital, and rooting out areas where there is unnecessary risk to patients.

Two pertinent research examples come to mind. First, the Commonwealth Fund released a report in late 2014 showing that Canada scores 10th out of 11 in First World nations when you look at the matrices of how their health care systems are measured. We need to sit down with the governments of the day and have a conversation about transforming, not just tweaking, health care for the generations ahead.

Second, OECD data tells us that the safest hospitals in the world have a maximum bed occupancy of about 85% at any given time. When I listen to colleagues both close to me and around the province, it's not unusual to hear that our hospitals have occupancies of over 100%. That's a problem. We need to make our hospitals more efficient, we need to improve access, and we need to admit the right patient to hospital at the right time.

Recruitment and retention challenges in BC continue to be top of mind. What do you envision as a way to overcome the enduring obstacles?

Recruitment and retention is no longer on the radar of only our rural communities; there's a desperate need for recruitment both in urban and rural and remote communities. Yes, there continues to be a disproportionate allocation of where physicians choose to live and work—25% of BC's population lives and works in rural communities, yet only 11% to 14% of doctors choose to work in these communities. We need to invest in rural-proofing BC, but we need to talk about the greater need as well. If we look at where the biggest investment in health care is, it goes back to the conversations around generalism, and those occur at our postsecondary education institutions. Universities need to grow their understanding of why investment in generalist medical training is going to serve society well. Absolutely, we need the broad range of world-class specialists in this province that we already have, who can continue to support patients when they need that type of care most, but we're now at a place where, because of the system of delivering care that we've developed in rural communities, we're better prepared to inform the urban conversation about what organizing services can look like. Maybe we can take the rural model and have a conversation with urban and metropolitan communities and get back to the day when generalist, hospital-type care was the foundation for what most people need.

What drives you?

I grew up with two brothers and a younger sister, so there was always a competitive streak in our household, and I think competition is very

healthy. Those who know me recognize that I can be impatient, sometimes tenacious, but I tend to organize those qualities around opportunities. Yes, I can be impatient when I see that we are not organizing our energies efficiently in health care across the province, but it's also about taking those energies and recognizing that if we can't produce meaningful change, we're going to tire out a lot of the people who are demonstrating leadership in BC's health care system. We need to move from collaboration to truly enacting the partnerships that we've created, and I see this as one of the most important areas that I can contribute to as the Doctors of BC president.

As president, what are you most interested in doing straight out of the gate?

The trajectory for the president is short—365 days—so I didn't come out with a clearly defined 100-day action plan because I think that's artificial. I have a strong mandate that's organized around embracing diverse thought, so I'm traveling extensively around the province right now, going to small communities, meeting with individual doctors, hearing the individual physician's voice, and giving them the chance to tell us what's working well, or where the health care system needs to improve; that's important.

I've made a promise to myself that I'm going to keep physically and emotionally healthy, as I could exhaust myself if I have to reach as many physicians in their own communities as I can if they themselves can't get to Vancouver from time to time.

Being a connector, I have some phenomenal relationships with physicians around the province, and I think my role as president is to help promote and support the activities of these physicians in their own roles as physicians of influence.

We have a huge responsibility as doctors to exercise our professional voice on issues of social determinants of health. The Council on Health Promotion has done stellar work over the years to highlight areas where doctors can advocate for social changes that can produce health. It shouldn't just be about managing sickness.

Do you have any concerns about achieving everything you set out for your year as president?

All of the goals I promoted in my campaign, I think, are achievable. But I think it's most important that I lay a stronger foundation for the association to stand on when it moves forward. We've got a strategic plan that's about to be renewed and updated, we're looking at governance reform within the association, these are important pillars.

The profession points its fingers at the association sometimes and says that we're simply not addressing certain needs, but we need to understand *why* we're organized as an association. Let's not forget, we have the College of Physicians and Surgeons, we have the Health Professions Act, we have the provincial government and health authorities. The Doctors of BC mission is to promote a social, economic, and political environment in which members can provide BC citizens with the highest quality of health care while allowing the doctors that we're serving to have a great professional life and receive fair economic reward. And that occurs in a publicly funded health care system, so we have to partner with society through the government and health authorities and other professions to ensure we can produce an improved system as we move forward. That change starts with having a collective will across those partners to transform health care in 2016. If the Commonwealth Fund tells us we are 10th out of 11, then we're failing.

We don't yet have a renewed Canadian Health Accord, so I look forward to working with the provincial government and the presidents of other provincial and territorial medical associations and starting a conversation with the federal Minister of Health if the opportunity allows. Let's talk about creating a sustainable health care system in Canada for the next 30 to 50 years.

Recognizing, as you do, that change takes time, where would you like to see the association in 10 years?

I would like to see Doctors of BC continue to be the strong representative voice for all doctors in the province, with a high-functioning Board that does executive work on behalf of the association while allowing the association's committees to grow their relationships with health authorities and government to make sure we're addressing the basic health care needs of all BC citizens.

In 10 years I would love to see that there are no wait lists or access issues in the province. It occurs in other countries; we should have the same in this province. BCMJ

calendar

MEDICAL CBT
Various locations and dates
When you learn medical cognitive behavior therapy's ultra-brief techniques, you'll feel much more comfortable handling the many "supratentorial issues" in your practice. Choose from the following workshops, each accredited for at least 12 Mainpro-C credits: Vancouver—Westin Vancouver Airport (16–17 Sep); Scottsdale—Fairmont Scottsdale Princess (24–26 Nov); Caribbean cruise—*Disney Fantasy* (10–17 Dec); Disney World—Grand Floridian Resort (19–21 Dec); Mexico—Iberostar Mayan Riviera (18–20 Jan), Bahamas—Atlantis Resort (9–11 Feb 2017); Las Vegas—Aria Resort (15–17 Feb); Whistler—Delta Whistler Village Suites (20–22 Mar); Maui—Sheraton Ka'anapali (27–29 Mar); Kauai—Grand Hyatt (10–12 Apr 2017); South Pacific cruise—*Paul Gauguin* (15–29 Apr 2017); Mediterranean cruise—*Celebrity Reflection* (9–20 Oct 2017). CBT Canada is a national winner of the CFPC's CME Program Award and is celebrating its 20th anniversary this year. Lead faculty Greg Dubord, MD, has given over 300 CBT workshops and is a recent University of Toronto CME Teacher of the Year. For details and to register visit www.cbt.ca or call 1 877 466-8228. Look for early-bird deadlines.

OCCUPATIONAL MEDICINE COURSES
Self-learning course, Sep–May
The Foundation Course in Occupational Medicine, developed at the University of Alberta, is now being presented across Canada in two parts. Our British Columbia Part-A course is facilitated by three BC occupational physicians and runs from September to May by monthly teleconferences and two full-day face-to-face Vancouver-based workshops (21 Jan and 27–28 May). This practical, case-based, group learning curriculum enhances the effectiveness of primary care and community-based physicians in dealing with occupational medicine cases including fitness-to-work determinations and disability prevention and management. Course enrollment is limited to 15 participants to enhance the small-group experience. This course (Part A) has been accredited by the CFPC for up to 111 M1-MainPro credits. Those completing Part A can progress to the Part-B course. Participants who pass written exams on both parts are eligible for accreditation from the Canadian Board of Occupational Medicine. For further information visit the Foundation's website at www.foundationcourse.ualberta.ca.

ST. PAUL'S EMERG MED UPDATE
Whistler, 22–25 Sep (Thu–Sun)
Join us at the Whistler Conference Centre for the 14th annual St. Paul's conference—4 exciting days of learning, networking, and, of course, recreation! Last year more than 300 people attended this meeting, so don't miss out this year. Pre-conference workshops: AIME, CASTED, EDE, EDE2, ACLS, CARE. Target audience: Any physician providing emergency care—from rural to urban, part-time to full-time, residents to seasoned veterans, and emergency nurses and paramedics. Special guests the Hair Farmers will be featured at our Friday night reception at the newly renovated GLC. Keynote speakers: Dr Grant Innes (University of Alberta), Dr Stuart Swadron (Keck School of Medicine, USC), Dr Judith Tintinalli (UNC School of Medicine), and Sam Sullivan (CM, MLA for Vancouver-False Creek). Conference registration, information, program details, and online registration is available at http://ubccpd.ca/course/sphemerg-2016. Phone 604 875-5101, fax 604 875-5078, e-mail cpd.info@ubc.ca, web ubccpd.ca.

MINDFULNESS IN MEDICINE
Tofino, 28 Sep–2 Oct (Wed–Sun)
Mindfulness in Medicine—Foundations of Theory and Practice is a 4-day experiential workshop approved for 16 Mainpro-C credits. The workshop's focus will be mindfulness and meditation as it relates to the unique challenges and blessings of our work as physicians. As chronic stress and its associated mental and physical health challenges continue to rise in epidemic proportions, the application of mindfulness in clinical practice settings has gained prominence both in terms of evidence-based research and in the popularity of its use. Learn about the latest clinical evidence and neuroscience on mindfulness in medicine, find out about programs offered throughout BC and Canada, and explore practical meditation tools for yourself and for your patients. Visit www.drmarksherman.ca for more information, or register at info@drmarksherman.ca.

WORKSAFEBC PHYSICIAN ED CONF
Kamloops, 22 Oct (Sat)
The 17th annual WorkSafeBC Physicians Education Conference will be held at Hotel 540 in downtown Kamloops. Physicians are invited to learn, share, and network at this WorkSafeBC-hosted conference. Attendees can expect a full day of discussion, dialogue, and workshops relating to the role of physicians in work-related injuries, and the latest protocols in disability management. The conference agenda includes 3 plenary sessions, 12 workshops to choose from, and 2 "short snapper" sessions that feature a brief presentation followed by an opportunity for Q&A. Register before 1 Oct to receive the early-bird discount. Accreditation: Applications

for Mainpro-M1 credits for the plenary sessions and Mainpro-C credits for the workshop sessions are in progress. More details will be available soon. For more information, contact Kerri Phillips at kerri.phillips@worksafebc.com or visit www.worksafebcphysicians.com.

SEMP COURSE
Vancouver, 27 Oct (Thu)
The Simulation Assisted Emergency Medicine Procedures course allows physicians to acquire, review, and practise their skills in essential life-saving emergency procedures. Before the course, students will have access to web-based learning modules to complete the self-directed learning. The hands-on portion of the course at the Centre of Excellence for Surgical Education & Innovation, Vancouver General Hospital, 3602–910 W. 10th Ave., will have experienced instructors demonstrating the procedures and supervising the students as they practise on animal and realistic plastic models. Students will have the opportunity to integrate performance of these procedures into the real-time resuscitation of a critically ill patient using the latest human patient simulator technology to create realistic scenarios. Maximum course capacity: 24 participants. Target audience: emergency physicians and rural physicians. Accreditation: up to 15 Mainpro-M1/MOC Section-3 credits. Register at ubccpd.ca/course/SEMP-Oct27-2016. Tel 604 875-5101, e-mail cpd.info@ubc.ca.

FALL/WINTER CME CRUISES FROM SEA COURSES
November 2016–March 2017
Travel with the CME cruise experts. Discover new destinations. Return to favorite ports. Costa Rica (Nov), Tahiti & Marquesas (Nov), Caribbean (Dec, Mar & Apr), South America (Jan), Australia/New Zealand (Feb), Mexico (Feb), Bali–Singapore (Feb). Trips planned by physicians for physicians. Sea Courses has provided almost 300 unique CME conferences onboard cruise ships over the past 20 years. Programs are accredited for specialists and family physicians, have no pharma-sponsorship and include a complimentary enrichment program for travelling companions. All Sea Courses trips offer group pricing, special airfares, and free cruising for companions. Contact Sea Courses Cruises for more information and details of current promotions. Phone 604 684-7327 or toll free 1-800-647-7327; e-mail cruises@seacourses.com. Visit www.seacourses.com for a complete list of CME cruises and tours.

UGEMP COURSE
Vancouver, 28 Oct (Fri), 18 Nov (Fri)
The use of bedside ultrasound by clinicians to guide invasive emergency and critical care procedures improves success and reduces complications, and is rapidly becoming established as the standard of care. The Ultrasound Guided Emergency Medicine Procedures course will be held at the Centre of Excellence for Surgical Education & Innovation, Vancouver General Hospital, 3602–910 W. 10th Ave. Pre-course work includes web-based learning modules to complete the self-directed learning. Human models will allow for demonstration of human surface landmarks, and ultrasoundable task-trainers that simulate the tactile feel of human tissue will allow for the repeated practice of invasive procedures without harming the human models. Formative evaluation in the form of immediate feedback provided by the instructor will help the students to monitor their progress and guide their learning. Maximum course capacity: 24 participants. Target audience: emergency, rural, intensive care, and family physicians, pediatricians, anesthetists, trauma physicians, residents, IMGs. Accreditation: up to 15 Mainpro-M1/MOC Section-3 credits. Register for 28 Oct at http://ubccpd.ca/course/UGEMP-Oct28-2016 and for 18 Nov at http://ubccpd.ca/course/UGEMP-Nov18-2016. Tel 604 875-5101, e-mail cpd.info@ubc.ca.

LIVE WELL WITH DIABETES
Richmond, 4–6 Nov (Thu–Sun)
Come check out the conference for health care professionals at the Radisson Hotel, our new venue in Richmond, close to the Canada Line station! Building on the success of our new 3-day format, this year's agenda includes presentations designed for family physicians, allied health professionals, podiatrists, and other health care professionals who have an interest in recent advances in diabetes. Featured topics: Diabetes and the elderly; Ambulatory glucose monitoring/CGMS; Combination therapy: Does 1 + 1 equal 3; Economics of

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diabetic foot complications: Importance of risk reduction; How to discuss obesity—A family physician's perspective. A public health fair has been scheduled for Sunday, 6 Nov, at the same venue. Conference registration, information, program details, and online registration are available at www.ubccpd.ca. Tel 604 875-5101, fax 604 875-5078, e-mail cpd.info@ubc.ca.

FP ONCOLOGY CME DAY
Vancouver, 19 Nov (Sat)
The BC Cancer Agency's Family Practice Oncology Network invites family physicians and primary care professionals to attend its annual Family Practice Oncology CME Day certified by the College of Family Physicians of Canada and the BC Chapter for up to 6.5 Mainpro+ credits. Attendees will gain up-to-date oncology knowledge and build useful cancer care connections. The session will take place at the Child & Family Research Institute at BC Children's Hospital in Vancouver and provide an effective way to learn about new oncology resources and support in BC. Register now at www.fpon.ca. For more information contact Jennifer Wolfe, jennifer.wolfe@bccancer.bc.ca or 604 219-9579.

ESSENTIAL MEDICAL-LEGAL TOOLKIT
Vancouver, Various dates
This program is suitable for family physicians and specialists and will be held at UBC Robson Square. Medical Legal Reports: The Essentials, will be held 9 a.m. to 4 p.m., 26 Nov (Sat), and 25 Feb (Sat). If writing medical legal reports causes you stress, if you are not sure what to write when asked about prognosis, unsure of what to do about patients' subjective complaints, or how much you should be billing for your reports, then this is the course you want to attend. Medical Legal Reports Advanced and Testifying in Court: Becoming a Great Expert, will be held 9 a.m. to 4 p.m. on 4 Mar (Sat) and will provide advanced training on writing more complex medical legal reports and provide tips on how to reduce stress while testifying in court. These courses will be taught by medical legal professionals with extensive experience—faculty who have busy personal injury practices and know exactly what they want from medical legal reports and expert testimony in court. Fees: $480/course. For registration and further information call 604 525-8604, e-mail manager@coremedicalcentre.com, or visit www.medlegaltoolkit.com.

GP IN ONCOLOGY TRAINING
Vancouver, 20 Feb–3 Mar (Mon–Fri), and 11–22 Sep 2017 (Mon–Fri)
The BC Cancer Agency's Family Practice Oncology Network offers an 8-week General Practitioner in

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Oncology training program beginning with a 2-week introductory session every spring and fall at the Vancouver Centre. This program provides an opportunity for rural family physicians, with the support of their community, to strengthen their oncology skills so that they may provide enhanced care for local cancer patients and their families. Following the introductory session, participants complete a further 6 weeks of customized clinic experience at the cancer centre where their patients are referred. These can be scheduled flexibly over 6 months. Participants who complete the program are eligible for credits from the College of Family Physicians of Canada. Those who are REAP-eligible receive a stipend and expense coverage through UBC's Enhanced Skills Program. For more information or to apply, visit www.fpon.ca, or contact Jennifer Wolfe at 604 219-9579.

HAWAIIAN CME: MAUI/KAUAI
Maui, 27–29 Mar 2017 (Mon–Wed); Kauai, 10–12 Apr 2017 (Mon–Wed)
Aloha! Please join us in the happiest American state next spring for award-winning CME in medical cognitive behavior therapy—Medical CBT: Ultra-brief techniques for real doctors. The Maui workshop (CBT for Depression/Happiness) will be held at the idyllic Sheraton Maui on Ka'anapali Beach. With 23 acres of lush Hawaiian grounds, you'll never feel crowded! Maui has been voted best island by the readers of *Condé Nast Traveler* for more than a dozen years. Attractions include 10 000 foot Hale'akala (Hawaiian for house of the sun), 14 golf courses (including some of the world's top-rated), the scenic road to Hana, the Seven Sacred Pools of Oheo, and over 500 restaurants. The Kauai workshop—CBT Tools, will be held at the spectacular Grand Hyatt on sunny Poipu Beach. The Grand Hyatt Kauai is ranked among the world's top resorts by both the *Condé Nast Traveler* and *Travel+Leisure*. Kauai is the most tranquil and pristine of the main Hawaiian Islands, with beaches fringing nearly 50% of its tropical coastline. Attractions include the world-famous Kalaulua Trail on the Napali Coast, red-rocked Waimea Canyon, 17-mile Polihale Beach (Hawaii's longest), crescent-shaped Hanalei Bay, and Hawaii's only navigable river, the Wailua. See www.cbt.ca for details about both the Maui and Kauai workshops. Warning: Our significantly discounted guestrooms for these two workshops will sell out far in advance.

SOUTH PACIFIC CRUISE
15–29 Apr 2017 (Sat–Sat)
The world's most romantic destinations, from French Polynesia to Fiji. Join us for a 13-night cruise exploring exotic Tahiti (where Captain Bligh's men mutinied to stay put), Mo'orea (Arthur Frommer's vote for "the most beautiful island on earth"), Taha'a (French Polynesia's vanilla-scented isle), Bora Bora (celebrities' exclusive hideaway), the Cook Islands (New Zealand's private paradise), the Kingdom of Tonga (proudly never colonized), and three idyllic islands of Fiji (Viti Levu, Vanua Levu, and postcard-perfect Beqa). You'll be enchanted by the South Pacific's craggy volcanic peaks, sugary beaches, warm lagoons teaming with fish, glistening black pearls, and Tamure dancing suggestive enough to make you blush. The CME provides a rock-solid foundation in medical CBT for depression, reviewing a plethora of ultra-brief office techniques to help patients defeat depression and be happy. CBT Canada is a national winner of the CFPC's CME Program Award, and is celebrating its 20th anniversary this year. Lead instructor Greg Dubord, MD, is a University of Toronto CME Teacher of the Year. Assistant faculty includes the inimitable Fijian psychiatrist Benjamin Prasad, MD, FRCPC, from the University of Manitoba. Super early bird rates for ocean-view staterooms aboard the spectacular m/s *Paul Gauguin* start at $11 750 (includes all beverages, all taxes, all gratuities, return airfares, and companion cruises free). Book with Canada's largest cruise agency, CruiseShipCenters. See CBT Canada at www.cbt.ca or call 1 888 739-3117.

BCMJ's CME listings

Rates: $75 for up to 150 words (maximum), plus GST per month; there is no partial rate. If the course or event is over before an issue of the *BCMJ* comes out, there is no discount. VISA and M/C accepted.

Deadlines: Online: Every Thursday (listings are posted every Friday). **Print:** The first of the month 1 month prior to the issue in which you want your notice to appear.

Let's help our children as parents and as doctors

As fall rolls around and a new school year begins, those of you with school-age children or grandchildren will be anxious as they start a new year. It's a time for new classmates, new teachers, and new challenges. As parents, we focus on academics and ensuring our children get the best education that will give them a good start to their lives. However, do we also consider the importance for our children to be physically active? A lot of our children will be involved in sports and this will help them reach the goal of being active for 60 minutes per day, the recommended amount of physical activity for children aged 5 to 17. But what if our children are not involved in sports? How can we ensure they also get the recommended amount of activity?

In addition to being physically active, the amount of sleep children get is increasingly being recognized as important. The 2016 ParticipACTION Report Card on Physical Activity for Children and Youth[1] emphasized the importance of sleep. As a result, 24-Hour Movement Guidelines for Children and Youth[2] have been released, which emphasize the importance of an appropriate amount of sleep for children. For children age 5 to 13 years, 9 to 11 hours of sleep is recommended, and 8 to 10 hours per night is recommended for those age 14 to 17. Without adequate sleep children are too tired to be active, and when they are not being active it makes it more difficult for them to sleep. These guidelines also emphasize the importance of limiting recreational screen time to minimize sedentary time. These are all factors that we as parents need to be aware of.

Do we as health professionals also have a responsibility to educate school-age children in these important areas? This begs the question of what our role is in health promotion for children. How can we play a role in promoting the importance of being physically active to children when we typically see children in the office only when they present with an illness? The ParticipACTION Report Card continues to rank our kids' activity level at a D-, which means less than 20% reach the guidelines of 60 minute per day. There is no silver bullet that will magically make children suddenly become more active. Everyone needs to do their part to help increase activity levels, reduce screen time, and help kids get the sleep they need and eat and drink healthy foods and beverages. This means parents, day-care operators, schools, parent advisory committees, community and recreation centres, sports teams, transportation systems, built environments, governments, and, yes, health care professionals and systems all play a role.

For children age 5 to 13 years, 9 to 11 hours of sleep is recommended, and 8 to 10 hours per night is recommended for those age 14 to 17.

As we move into the fall we, as health care professionals, have opportunities to lead the way in promoting good health to our children. Schools will have a renewed focus on promoting physical activity to children, led by the Directorate of Agencies for School Health (DASH) BC and Action Schools BC, with new government funding.

During October the Doctors of BC Be Active Every Day initiative will be challenging school children to follow the Live 5-2-1-0 message: 5 or more fruits and vegetables each day, no more than 2 hours of recreational screen time per day, at least 1 hour of physical activity per day, and 0 sugar sweetened drinks per day. As well this year we will incorporate the importance of adequate sleep. We hope to work with schools to engage as many students as possible. That means we need doctors in every community to step up and help us lead the way in promoting these important health habits. October will also see an initiative for children to be active in Walk and Wheel to School Week (3 to 7 October). Let's make it happen! To learn more about Be Active Every Day, e-mail Patrick Higgins at phiggins@doctorsofbc.ca.

—Ron Wilson, MD
Chair, Athletics and Recreation Committee

This article is the opinion of the Council on Health Promotion and has not been peer reviewed by the BCMJ *Editorial Board.*

References

1. ParticipACTION. Report card on physical activity for children and youth, 2016. Accessed 3 August 2016. www.participaction.com/en-ca/thought-leadership/report-card/2016.
2. Canadian Society for Exercise Physiology. 24-hour movement guidelines for children and youth, 2016. Accessed 3 August 2016. www.csep.ca/en/guidelines/get-the-guidelines.

guidelines for authors

The *British Columbia Medical Journal* is a general medical journal that seeks to continue the education of physicians through review articles, scientific research, and updates on contemporary clinical practices while providing a forum for medical debate. Several times a year, the *BCMJ* presents a theme issue devoted to a particular discipline or disease entity.

We welcome letters, blog posts, articles, and scientific papers from physicians in British Columbia and elsewhere. Manuscripts should not have been submitted to any other publication. Articles are subject to copyediting and editorial revisions, but authors remain responsible for statements in the work, including editorial changes; for accuracy of references; and for obtaining permissions. The corresponding author of scientific articles will be asked to check page proofs for accuracy.

The *BCMJ* endorses the "Uniform requirements for manuscripts submitted to biomedical journals" by the International Committee of Medical Journal Editors (updated October 2008), and encourages authors to review the complete text of that document at www.icmje.org.

Material may be submitted for publication consideration by either e-mail or post, though upon acceptance an electronic file must be provided for all submissions except short letters. Send submissions to:

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Tel: 604 638-2815
Web: www.bcmj.org

EDITORIAL PROCESS

Letters to the editor, articles, and scientific papers must be reviewed and accepted by the *BCMJ's* eight-member Editorial Board prior to publication. The Board normally meets the last Friday of every month, at which time submissions are distributed for review the following month. We do not acknowledge receipt of submissions; the editor will contact authors of articles by post or e-mail once the submission has been reviewed by the Board (usually within 8 to 10 weeks of submission). The general criteria for acceptance include accuracy, relevance to practising BC physicians, validity, originality, and clarity. The editor contacts authors to inform them whether the paper has been rejected, conditionally accepted (that is, accepted with revisions), or accepted as submitted. Authors of letters are contacted only if the letter is accepted and editorial staff need further information. Scientific papers and other articles typically take 5 to 10 months from the date of receipt to publication, depending on how quickly authors provide revisions and on the backlog of papers scheduled for publication. Manuscripts are returned only on request. The *BCMJ* is posted for free access on our web site.

FOR ALL SUBMISSIONS

- ☐ Avoid unnecessary formatting, as we strip all formatting from manuscripts.
- ☐ Double-space all parts of all submissions.
- ☐ Include your name, relevant degrees, e-mail address, and phone number.
- ☐ Number all pages consecutively.
- ☐ If submitting hardcopy, use 8 1/2" x 11" white paper, leaving wide margins.

Opinions

BCMD2B (medical student page). An article on any medicine-related topic by a BC physician-in-training. Less than 2000 words. The *BCMJ* also welcomes student submissions of letters and scientific/clinical articles. BCMD2B and student-written clinical articles are eligible for an annual $1000 medical student writing prize.

Blog. A short, timely piece for online publication on bcmj.org. Less than 500 words. Submissions on any health-related topic will be considered. Should be current, contain links to related and source content, and be written in a conversational tone.

The Good Doctor. A biographical feature of a living BC physician. Less than 2000 words.

Personal View (letters). All letters must be signed, and may be edited for brevity. Letters not addressed to the Editor of the *BCMJ* (that is, letter copied to us) will not be published. Letters commenting on an article or letter published in the *BCMJ* must reach us within 6 months of the article or letter's appearance. No more than three authors. Less than 300 words.

Point-Counterpoint. Essays presenting two opposing viewpoints; at least one is usually solicited by the *BCMJ*. Less than 2000 words each.

Premise. Essays on any medicine-related topic; may or may not be referenced. Less than 2000 words.

Proust for Physicians. A lighthearted questionnaire about you. Submit responses online at www.surveymonkey.com/s/proust-questionnaire, print a copy from the *BCMJ* website at www.bcmj.org/proust-questionnaire, or contact journal@doctorsofbc.ca or 604 638-2858.

Special Feature. Articles, stories, history, or any narrative that doesn't fit elsewhere in the *BCMJ*. Less than 2000 words.

Departments

In Memoriam. Include birth and death dates, full name and name deceased was best known by, key hospital and professional affiliations, relevant biographical data, and photo. Less than 300 words.

Pulsimeter (news). A miscellany of short news items, announcements, requests for study participants, notices, and so on. Submit suggestions or text to journal@doctorsofbc.ca or call 604 638-2858 to discuss. Less than 300 words.

CLINICAL ARTICLES/CASE REPORTS

Manuscripts of scientific/clinical articles and case reports should be 2000 to 4000 words in length, including tables and references. Electronic submission preferred (e-mail to journal@doctorsofbc.ca). If sending hardcopy, submit only one copy of the article, but two sets of figures (prints). Retain one copy of the article and prints for yourself. Keep an up-to-date electronic copy of the manuscript as we will require it upon final acceptance. The first page of the manuscript should carry the following:

- ☐ Title, and subtitle, if any.
- ☐ Preferred given name or initials and last name for each author, with relevant academic degrees.
- ☐ All authors' professional/institutional affiliations, sufficient to provide the basis for an author note such as: "Dr Smith is an associate professor in the Department of Obstetrics and Gynaecology at the University of British Columbia and a staff gynecologist at Vancouver Hospital."
- ☐ A structured or unstructured abstract of no more than 150 words. If structured, the preferred headings are "Background," "Methods," "Results," and "Conclusions."
- ☐ Three key words or short phrases to assist in indexing.
- ☐ Disclaimers, if any.
- ☐ Name, address, telephone number, and e-mail address of corresponding author.

Authorship, copyright, disclosure, and consent form

When submitting a clinical/scientific/review paper, all authors must complete the *BCMJ's* four-part "Authorship, copyright, disclosure, and consent form."

1. Authorship. All authors must certify in writing that they qualify as an author of the paper. To be considered an author, an individual must meet all three conditions:

- ☐ Made substantial contributions to the conception and design, acquisition of data, or analysis and interpretation of data, and
- ☐ Drafted the article or revised it critically for important intellectual content, and
- ☐ Given final approval of the version to be published.

Order of authorship is decided by the co-authors.

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Include all relevant details regarding publication, including correct abbreviation of journal titles, as in *Index Medicus;* year, volume number, and inclusive page numbers; full names and locations of book publishers; inclusive page numbers of relevant source material; full web address of the document, not just to host page, and date the page was accessed. Examples:

1. Gilsanz V, Gibbons DT, Roe TF, et al. Vertebral bone density in children: Effect of puberty. Radiology 2007;166:847-850.

(NB: For more than three authors, list first three, followed by "et al.")

2. Mollison PL. Blood Transfusion in Clinical Medicine. Oxford, UK: Blackwell Scientific Publications; 2004. p. 78-80.
3. O'Reilly RA. Vitamin K antagonists. In: Colman RW, Hirsh J, Marder VJ, et al. (eds). Hemostasis and Thrombosis. Philadelphia, PA: JB Lippincott Co; 2005. p. 1367-1372.
4. Health Canada. Canadian STD Guidelines, 2007. Accessed 15 July 2008. www.hc-sc.gc.ca/hpb/lcdc/publicat/std98/index.html.

(NB: The access date is the date the author consulted the source.)

A book cited in full, without page number citations, should be listed separately under Additional or Suggested Reading. Such a list should contain no more than five items.

References to unpublished material

These may include articles that have been read at a meeting or symposium but have not been published, or material accepted for publication but not yet published (in press). Examples:

1. Maurice WL, Sheps SB, Schechter MT. Sexual activity with patients: A survey of BC physicians. Presented at the 52nd Annual Meeting of the Canadian Psychiatric Association, Winnipeg, MB, 5 October 2008.
2. Kim-Sing C, Kutynec C, Harris S, et al. Breast cancer and risk reduction: Diet, physical activity, and chemoprevention. CMAJ. In press.

Personal communications are not included in the reference list, but may be cited in the text, with type of communication (oral or written) communicant's full name, affiliation, and date (e.g., oral communication with H.E. Marmon, director, BC Centre for Disease Control, 12 November 2007).

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Report measurements of length, height, weight, and volume in metric units. Give temperatures in degrees Celsius and blood pressures in millimetres of mercury. Report hematologic and clinical chemistry measurements in the metric system according to the International System of Units (SI).

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MERRITT—FP
Rolling hills, sparkling lakes, and over 2030 hours of sunshine every year make Merritt a haven for four-season outdoor recreation. We have a need for family physicians in their choice of clinic. Nicola Valley Hospital and Health Centre is a 24-hour level-1 community hospital with a 24-hour emergency room. Royal Inland Hospital in Kamloops is a tertiary-level hospital located only 86 km away. Remuneration is fee-for-service ($250 000 to $450 000-plus per year), rural retention incentives and on-call availability payment. For more information e-mail physicianrecruitment@interiorhealth.ca or view online at www.betterhere.ca.

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Physician required for the busiest clinic/family practice on the North Shore! Our MOAs are known to be the best, helping your day run smoothly. Lucrative 6-hour shifts and no headaches! For more information, or to book shifts online, please contact Kim Graffi at kimgraffi@hotmail.com or by phone at 604 987-0918.

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NANAIMO—GP
General practitioner required for locum or permanent positions. The Caledonian Clinic is located in Nanaimo on beautiful Vancouver Island. Well-established, very busy clinic with 26 general practitioners and 2 specialists. Two locations in Nanaimo; after-hours walk-in clinic in the evening and on weekends. Computerized medical records, lab, and pharmacy on site. Contact Ammy Pitt at 250 390-5228 or e-mail ammy.pitt@caledonianclinic.ca. Visit our website at www.caledonianclinic.ca.

NEW WEST—FAMILY PHYSICIAN
New Westminster: Columbia Square Medical Clinic is looking for a family physician for a full- or part-time position. Partnership and options to buy are available. Flexible hours, competitive split. The clinic is newly renovated with bright rooms, Oscar EMR, excellent friendly and efficient staff, 20 minutes from downtown Vancouver. We have 800 families waiting for a family doctor who wants to establish a permanent practice or work part-time. Considering a change of location or practice style? Call Irina at 778 886-6511 or e-mail irinapaynemd@gmail.com.

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Powell River is a rural community of 20 000 people on the Sunshine Coast of British Columbia, a 25-minute flight from Vancouver. It's known for its waterfront location, outdoor beauty, urban culture, and international music festivals. Supported by a 33-bed general hospital, the close-knit medical community consists of 26 general practitioners, 4 ER and anesthesia physicians, 2 NPs, and 7 specialists. We are looking for permanent general practitioners and locums. Please visit divisionsbc.ca/powellriver/opportunities for details.

RICHMOND—FP
Best clinic to work at in Richmond! Full- or part-time physician needed for busy, modern walk-in/family medicine clinic. We are a team of caring physicians and staff looking for a like-minded addition to our team. Central Richmond, OSCAR EMR, large rooms, on-site pharmacy. E-mail: Livewellmedical@shaw.ca; Website: www.livewellmedicalcentre.com.

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Opportunity to practise in a busy family practice in Richmond, BC. Great location. Excellent staff. Please call Lesily at 604 270-1998 or e-mail lesily@shaw.ca.

RICHMOND—FP & LOCUMs
Opportunities for physicians looking to do walk-in shifts, build a practice, or relocate in our busy modern clinic. EMR OSCAR. Great location next to a 24-hr Shoppers Drug Mart. No hospital work, no call, 70/30 split—walk-in shifts at $100 per hour minimum—and bonus available. Contact us at healthvuemedical@gmail.com, 604 270-9833/604 285-9888.

SURREY (WHALLEY)—METHADONE-LICENSED GP
Methadone-licensed GP needed to joint an addiction clinic. No overhead if available week

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Your Professional Practice Lifecyle

By Don Murdoch

Where Are You in Your Professional Practice Lifecycle?

We often have conversations with our medical professional clients that start something like this: "I was visiting with a colleague the other day between cases and they were telling me I should…" The ideas shared during these visits are likely good ideas, but the key is to understand that what might be the right idea at the right time for your colleague may not be the right idea for you at this time. It is important to recognize your career decisions will uniquely match your personal circumstances and needs.

Every professional practice goes through a series of stages in its evolution. From a tax perspective, failure to plan properly at each stage of your practice lifecycle may result in significant financial consequences or lost opportunities down the road. The first step to effective tax planning is to understand what stage your practice is at today.

Getting Started: As you embark on your medical practice, you need to choose an initial structure that will match your initial financial goals. These goals likely include retirement of any remaining education debt and looking towards a possible home purchase. Consideration should also include your current personal circumstances. Do you know where you plan to build your practice? Are you married? Do you have children or other dependents?

Creating a Financially Efficient Practice: At this point, your practice has demonstrated to you that you will be able create financial resources to meet your personal cost of living and accumulate wealth for your future financial goals. If you have not already done so, incorporation of your practice can usually add more power to your savings.

Wealth Accumulation: At this stage, you are enjoying a very profitable practice that is creating the financial resources for an expanding list of personal and financial goals. You are not likely ready to retire but you can start thinking about how you want your retirement to look and structure a plan to get there.

After Practice: A very common reminder to our medical professional clients is "you don't give the money back after you stop practicing." The wealth you have accumulated now needs a plan that works with your retirement savings (RRSP or IPP), government benefits and other income sources. This will include estate planning, income tax minimization and capital gains considerations.

Over the next several articles, we will look at each of these stages in more depth to point out how your tax structure and strategies should evolve as your practice grows.

With 20 locations throughout British Columbia, MNP provides support to medical professionals at all stages of their careers. Contact Don Murdoch, B.C. Leader, Professional Services at 1.877.766.9735 or don.murdoch@mnp.ca

For more information about MNP's Professional Services, visit our website at

www.mnp.ca/en/professionals

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days other than Tuesday and Thursday. Patient loads guaranteed. Staffed with MOA and counselor. MSP billing available. Please apply by e-mail to healthmedicalservices@gmail.com or contact 604 715-6011 for more info.

SURREY/DELTA/ABBOTSFORD—GPs/SPECIALISTS

Considering a change of practice style or location? Or selling your practice? Group of seven locations has opportunities for family, walk-in, or specialists. Full-time, part-time, or locum doctors guaranteed to be busy. We provide administrative support. Paul Foster, 604 572-4558 or pfoster@denninghealth.ca.

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VANCOUVER—FP

Mainland Medical Clinic is seeking a family doctor for our modern, multidisciplinary street-level clinic in Yaletown, downtown Vancouver. We have been operating for over 13 years in a comfortable setting shared with a chiropractor, massage therapists, and a nutritionist to complement our three family doctors. Ideally seeking someone with an existing practice—perhaps relocating or cutting back. We serve a broad spectrum of patients, both walk-ins and appointments. Excellent revenue split. The clinic offers a pleasant work environment in an upbeat, fun neighborhood. Contact Dr Brian Montgomery at brian@mainlandclinic.com or 604 240-1462, or just drop by.

VANCOUVER—FT/PT DERM

Dermatologist wanted to join busy Aesthetic Medical Clinic in Vancouver. Full- or part-time. Please reply by e-mail to kt.crawford03@gmail.com.

VANCOUVER—LOCUM

Busy walk-in shifts in Kitsilano at Khatsahlano Medical Clinic, three-time winner of Georgia Straight reader's poll for Best Independent Medical Clinic in Vancouver. Split is 65%; 70% on evenings/weekends. Contact Dr Chris Watt at drchriswatt@gmail.com.

VANCOUVER—PRIVATE PRACTICE/WALK-IN

Our clinic is located in the heart of Vancouver in the Cambie Village/Broadway corridor and right beside the Canada Line SkyTrain (Broadway–City Hall Station). This is a large 1890 sq. ft. facility with large windows. The front staff will consist of an office manager and multiple full-time medical office assistants. The clinic will be looking for: walk-in physicians, locum physicians, family physicians, and specialists. Full-time and part-time positions are available. Standard 30%/70% for remuneration. Please contact lilywu85@gmail.com to e-mail your resume and cover letter. Three months free rent.

VERNON—AESTHETICS/VEIN/LASER

Outstanding opportunity to join a well-established and thriving GP derm/aesthetics/vein/laser practice in one of the best places to live in Canada. We are looking for an associate/equity partner(s). The office has all the latest technology and an excellent, congenial staff. Training provided but a special interest in dermatology a definite asset. The Okanagan has some of the best weather, lakes, wineries, golf courses, ski hills, and overall lifestyle anywhere in Canada, if not the world. Contact Dr William Sanders: 250 558-9606, w.sanders@shaw.ca.

VICTORIA (OAK BAY)—MD PARTNER

Derma Spa is a well established, medical/cosmetic practice located in the charming seaside neighborhood of Oak Bay, Victoria. Our business is growing and we have an experienced medical, financial, and marketing team in place to support you. Please contact Alex at 250 580-9428 or concierge@dermaspa.ca.

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Shifts available at three beautiful, busy clinics: Burnside (www.burnsideclinic.ca), Tillicum (www.tillicummedicalclinic.ca), and Uptown (www.uptownmedicalclinic.ca). Regular and occasional walk-in shifts available. FT/PT GP post also available. Contact drianbridger@gmail.com.

VICTORIA—SHARED PRACTICE

Ideal opportunity for Mandarin/Cantonese–speaking physician to join a turnkey, EMR practice with a view to building the practice. Escape the high-cost accommodation in Vancouver and relocate to Victoria, known for its breathtaking natural beauty and enviable quality of life. Combine a rewarding career with a satisfying lifestyle. E-mail chewmoa@shaw.ca.

VICTORIA—WALK-IN

Walk-in clinic shifts available in the heart of lovely Cook St. Village in Victoria, steps from the ocean, Beacon Hill Park, and Starbucks. For more information contact Dr Chris Watt at watt1@telus.net.

WEST VAN—FAMILY PHYSICIANS

West Vancouver, FP/walk-in. Continuum Medical Care is a large multidisciplinary clinic located in the heart of West Vancouver. We are again expanding and are looking for primary care physicians to join our team of 12 FPs, 7 specialists, and a variety of allied health professionals. With over 17 000 patients, we are seeking primary care physicians to work in our recently opened walk-in clinic and in our newly renovated main clinic, offering full-service family practice care. Specialty training or diploma in sport medicine, geriatrics, lifestyle medicine, concierge medicine, or executive health would be an asset. Please contact Dr Bryce Kelpin at 604 928-8187, or e-mail bkelpin@telus.net.

WILLIAMS LAKE—FP EMERGENCY

Seeking CCFP-EM or CCFP with ER experience. Cariboo Memorial Hospital services a population of approximately 26 000 with 20 000 visits to the ER annually. ER is staffed by six full-time ER physicians and a variety of part-time ER physicians (staffed 24/7). We have a 28-bed hospital with 3-bed ICU. Excellent collegial specialist support including general surgery, OB/GYN, pediatrics, internal med, radiology, anesthesia, and psychiatry. Further specialist support available at our referral centre in Kamloops. Williams Lake is known for its outdoor opportunities and full range of amenities (including local college and airport). Contact 1 877 522-9722 or physicianrecruitment@interiorhealth.ca.

medical office space

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NEW WEST/VANCOUVER—MED OFFICE SPACE
We have two locations suitable for a small medical practice and/or walk-in clinic. Space is shared with existing pharmacy. Both locations have three exam rooms and a small reception area. First location is in New West ready for use. The second location is in Vancouver on Commercial Drive and is to be ready in 3 months, but can be viewed by appointment. The space available is for physicians willing to run their own clinic, which means you will not be splitting anything. Call 778 316-7111 or e-mail sten337@yahoo.ca for more information.

PORT COQUITLAM—MED OFFICE SPACE
Approximately 1500 sq. ft. space in a high-traffic strip mall available. You will have a dentist office, massage therapist, physio, and much more available as your neighbors. Building is 16 years young. End unit. The neighborhood would love a doctor's office. Available for immediate possession. Call for details: 403 828-9596/604 941-7025.

RICHMOND—MED OFFICE SPACE
New modern EMR clinic in Steveston Village looking for physicians to join our team. Opportunities to start a practice or relocate existing practice without worrying about administrative headaches. We offer base 70/30 split and higher for complex care and forms. Visit www.HealthVue.ca or contact healthvuemedical@gmail.com, 604 285-9888.

RICHMOND—PSYCHIATRIST or THERAPIST
Psychiatrist (and owner) wishes to share fully furnished aesthetic office; 200 sq. ft. suitable for group or individual counselling. Wheelchair accessible, ground floor, in-office sink. One parking spot. Quiet setting, trees and pond nearby. Available immediately weekdays and weekends from $95 per half-day. E-mail jasbhopal66@msn.com or call 604 616-3250.

SURREY (CLAYTON HEIGHTS)—NEW CLINIC, RENT FREE
Brand new furnished medical clinic opening in Surrey (Clayton Heights). An opportunity for a group of family physicians looking to lower existing overhead or new physicians looking to start a practice. Lease and operating costs subsidized by pharmacy operating beside clinic. Contact Rob at 778 235-8137 or e-mail robd@claytonwellness.com.

VAN (VGH AREA)—MED OFFICE SUBLEASE
Office space for psychiatrists, psychologists, or any other specialist MD. No secretary or other additional overhead expenses. Top floor. Great view. Two offices for sublease. One office is bigger and has a sink and space for an examination table. E-mail alevin@drlevin.ca.

VANCOUVER (DWTN)—MED OFFICE SPACE
Two established psychiatrists seeking a third psychiatrist to share office space in the Robson Professional Building located on Robson Street. The space features two bright offices; reception/waiting room area; kitchen with sink, fridge, and microwave; and includes full secretarial services (reception, typing, and billing). Opportunity for mentoring in assessment and treatment of ADHD and comorbidities available. Very reasonable rent. Available: January 2017. Call 604 687-0654 or e-mail inquiries to dr.melck@telus.net.

VANCOUVER—WEST BROADWAY
Fully furnished space for one or multiple doctors. Space can be used part-time or full-time with short- or long-term arrangement possible. Use some or all of the large space. MOA provided if needed. Extraordinary views. Concrete professional building with elevators, underground parking, and three restaurants. Available immediately. Please call Neil at 604 644-5775.

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Medical office space available for part-time use on weekdays and weekends. Two rooms. Great view, lots of natural light, ideal location in Ambleside. Located in medical building with pharmacy, lab, X-ray, etc. Please e-mail poorvijju2004@yahoo.co.uk or call 778 919-0585 or 604 356-3282.

WHISTLER—VISITING SPECIALISTS
New office space for rent for visiting specialists in Whistler. Day rate, reception and booking, wheelchair accessible, free parking, available now. For more information please call 604 905-1500 or e-mail katduval53@gmail.com.

miscellaneous

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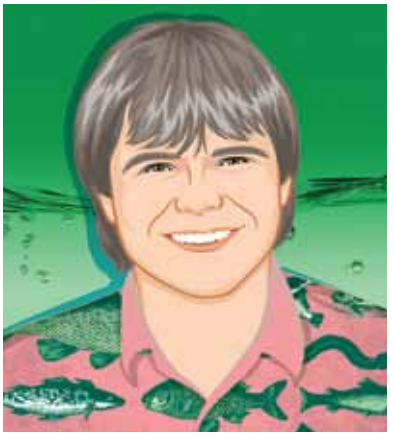
VANCOUVER—TAX & ACCOUNTING SVCS
Rod McNeil, CPA, CGA: Tax, accounting, and business solutions for medical and health professionals (corporate and personal). Specializing in health professionals for the past 11 years, and the tax and financial issues facing them at various career and professional stages. The tax area is complex and practitioners are often not aware of solutions available to them and which avenues to take. My goal is to help you navigate and keep more of what you earn by minimizing overall tax burdens where possible, while at the same time providing you with personalized service. Website: www.rwmcga.com, e-mail: rodney@rwmcga.com, phone: 778 552-0229.



Proust questionnaire: Harvey Thommasen, MD

What profession might you have pursued, if not medicine?
Conservation officer.

Which talent would you most like to have?
I wish I could sculpt wildlife.

What do you consider your greatest achievement?
I recently received a Nuxalk Indian name: Ni-niits-m-layc, which means "He who restores life," from the Bella Coola hereditary chief's family.

Who are your heroes?
My grandfather, Victor Goresky, who was a solo family physician working in Castlegar.

What is your idea of perfect happiness?
I am living it now. I just quit medicine because there are no jobs for rural physicians who do not want to do call, and I now just wander the woods, drift the river, raise honeybees and ducks, bird watch, and enjoy my wife's company.

On what occasion do you lie?
When I don't want the person I am with to get in trouble if they were to know about something I probably should not have done.

What is your greatest fear?
I have no fears; every day I live is a bonus.

What is the trait you most deplore in yourself?
I do not suffer fools gladly.

What characteristic do your favorite patients share?
My favorite patients remind me of my parents—both were disabled (deaf mute), poorly educated, but kind-hearted, hardworking, and keen to understand the world.

Which living physician do you most admire?
Dr Charles Helm of Tumbler Ridge.

What is your favorite activity?
Floating down the Bella Coola River on a warm September day watching for surfacing northern coho.

Which words or phrases do you most overuse?
"Hey man."

Where would you most like to practise?
I have worked in all the places I most wanted to practise—Masset (Chinook salmon and halibut), Dease Lake (pike, grayling, and large rainbow trout), Houston (steelhead), Tumbler Ridge (fossil fish), and Bella Coola (sea-run trout, salmon, and char).

What medical advance do you most anticipate?
Targeted immunotherapy therapy for cancer.

What is your most marked characteristic?
I have the ability to focus on completing tasks/projects without getting too distracted by the small stuff.

What do you most value in your colleagues?
Hard work and commitment to improving community health.

Who are your favorite writers?
Roderick L. Haig-Brown (e.g., *A River Never Sleeps*).

What is your greatest regret?
That I did not have more time for my wife and family when I was a young doctor.

What is your motto?
A Henry David Thoreau quote: "If a man does not keep pace with his companions, perhaps it is because he hears a different drummer. Let him step to the music which he hears, however measured or far away."

How would you like to die?
In my sleep or on a glacier like Otzi the Iceman—someone I am genetically related to according to 23andMe.

Dr Thommasen is a recently retired rural family physician and has been a frequent contributor to the *BCMJ*.

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Essential Medical Legal Toolkit

For FAMILY PHYSICIANS and SPECIALISTS

Medical Legal Reports: *The Essentials*

Saturday, November 26, 2016 or Saturday, February 25, 2017 (9 am–4 pm)

Does writing medical legal reports cause you stress? Not sure what to write when asked about prognosis? Need help figuring out how much you should be billing for your reports? What to do when patients have subjective complaints?

This course will outline:

- The essential components of a medical legal report
- How to clearly narrate the patient's history, physical examination findings, diagnosis and prognosis
- The steps to complete a medical legal report efficiently
- How to streamline the payment/invoicing for medical legal reports
- How lawyers, juries and judges identify the good, bad and ugly medical legal report
- Common challenges with medical legal reports and how to easily resolve them

Medical Legal Reports Advanced and Testifying in Court: *Becoming a Great Expert*

Saturday, March 4, 2017 (9 am–4 pm)

Physicians and all health care professionals generally prefer not to testify in court. This course will provide advanced training on writing more complex medical legal reports as well as how to reduce the stress of testifying in court.

This course will outline:

- Advanced skills for successful medical legal report writing
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- How to answer complex questions related to Cost of Future Care and Future Treatment
- The role of the medical/health professional expert witness in court
- How to prepare for court testimony
- How to succeed in the various parts of expert testimony: Qualifying the expert, direct testimony, cross examination, re-direct
- Common pitfalls and traps in court—and how to avoid them

Dr Gurdeep Parhar

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