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British Columbia's COVID-19 experience

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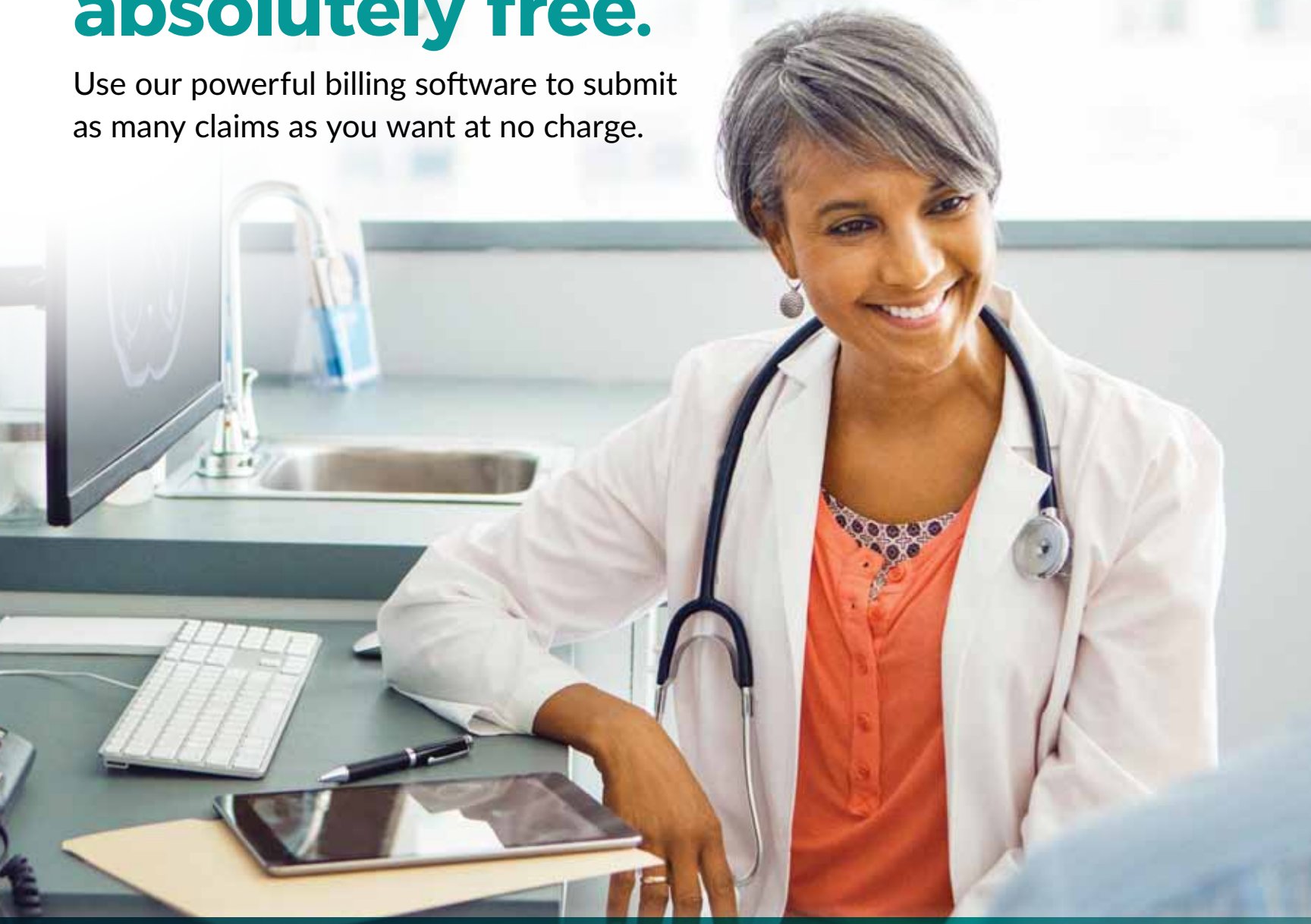

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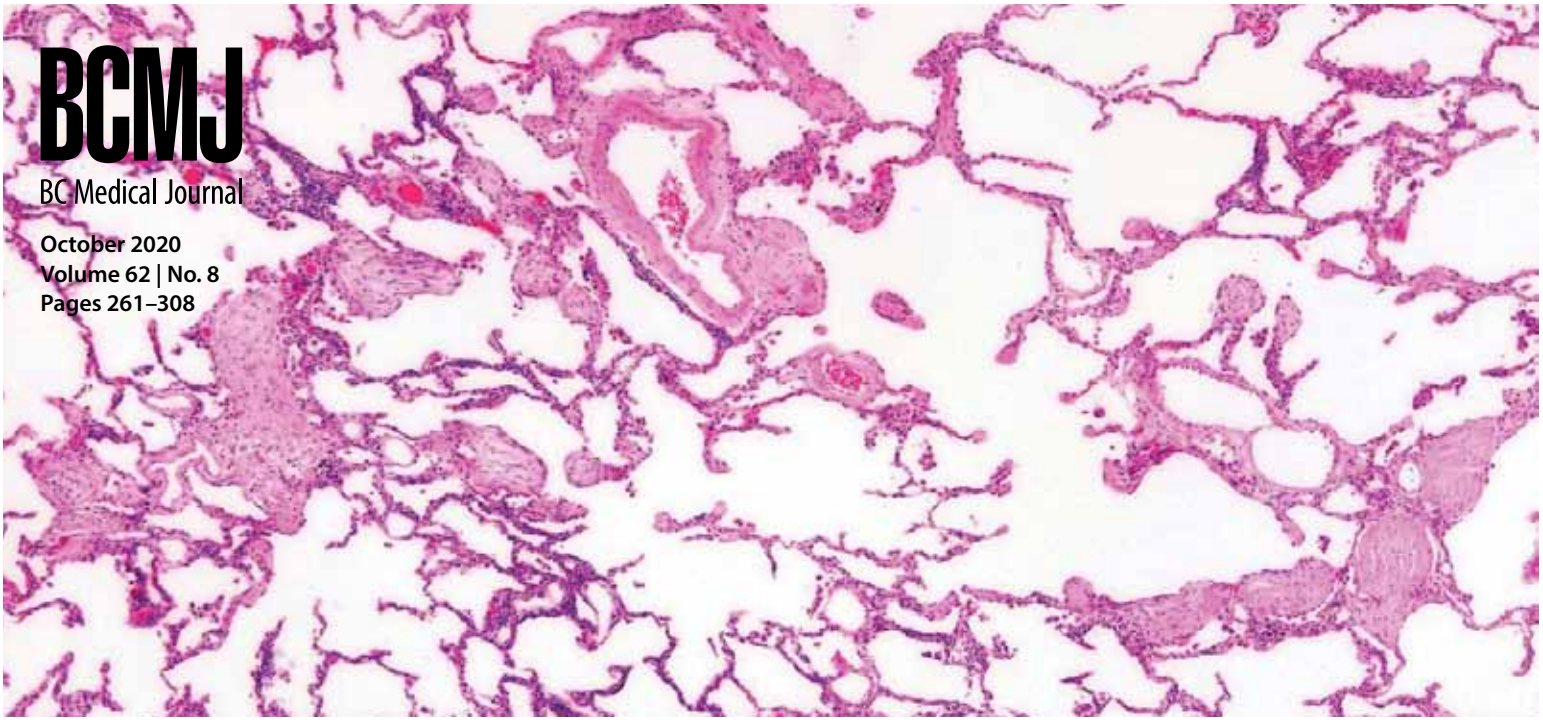

A wedge resection sample of a patient's left lower lobe showing cicatricial organizing pneumonia. Read more in the article "Vaping-associated lung injury causing organizing pneumonia: A case report" beginning on page 268.

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ON THE COVER
British Columbia's COVID-19 experience
British Columbia has fared better than many other jurisdictions in our emergency response to COVID-19. Learn about the public health response thus far, as well as plans for the future, from Drs Thiara, Henry, Patrick, and Kanji, beginning on page 277.

The *BCMJ* is published by Doctors of BC. The journal provides peer-reviewed clinical and review articles written primarily by BC physicians, for BC physicians, along with debate on medicine and medical politics in editorials, letters, and essays; BC medical news; career and CME listings; physician profiles; and regular columns.

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We often talk about living a good life, but how do we die a good death? Read more about the Legacy Project beginning on page 292.

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Cannabis revisited

Since we are probably all suffering from a bit of COVID-19 fatigue, I decided to write about something a little more calming and relaxing—cannabis. In the October 2018 issue, I authored an editorial on the legalization of cannabis in BC for residents aged 19 and older. Since almost 2 years has passed, I thought it was time to revisit this topic.

I suggested that cannabis might trend toward its big brother, alcohol, as a significant part of our social culture. In my circles, this really has not happened but, admittedly, I do not have much of a social life due to my unpleasant and increasingly grumpy demeanor. In addition, get-togethers have certainly been limited the last 6 months (due to the pandemic that should not be mentioned).

Regardless, cannabis use at functions appears to be pretty much as it was before. Individuals who liked to smoke are still using it. Cannabis certainly has not showed up on any restaurant or bar menus that I have seen. I guess we will have to continue to wait for the chef's menu with cannabis pairings. Also, cannabis-infused alcoholic beverages are not flooding the drink market.

I was worried that cannabis use in public spaces would become a problem but, to be honest, other than perhaps getting more frequent wafts of cannabis smoke, this has not happened.

As for the issue of driving while under the influence of cannabis, I could not find any statistics that show offences have climbed since the legalization of cannabis. This does not mean individuals are not driving under the influence, just that they are not being caught or charged.

One change I have noticed is the increasing use of cannabis, particularly CBD (cannabidiol), products by the general population for health-related reasons. Some patients are rubbing CBD creams on every body part while others are using drops and edibles for every type of ailment. A few years ago, cannabis consumption in seniors was a rare event, but among my patients and according to Statistics Canada, medicinal use in this population is increasing rapidly.

Perhaps there is a benefit to using cannabis for certain medical conditions, but it is unlikely to be a panacea for all the diseases it is currently being promoted for. One problem is that a controlled double-blinded study is unlikely to ever be done, as who would fund it? Cannabis producers would not want a study to show a lack of benefits and drug companies have no interest in funding something they cannot patent.

[Black market] cannabis is much cheaper and often of a superior quality.

The major driving force behind legalization was to remove the criminal element behind cannabinoid production. For this to occur, legal cannabis would have to be of good quality and the same price as the black-market product, which has not happened. My savvy patients relate that criminal cannabis is much cheaper and often of a superior quality. Therefore, significant money is still being made illegally without much in the way of prosecution as the opioid crisis is consuming most of the law enforcement resources.

I am relieved that legalization of cannabis does not appear to have negatively impacted the citizens of BC. Admittedly, it is still early in the process of legal cannabis production, but it seems that most of the concerns I expressed in my 2018 editorial have dissipated like a puff of acrid smoke. ■

—David R. Richardson, MD

Peer reviewers, editors, experts, and statisticians—do we need them?

My views on statistical relevance and peer review have evolved over the years. At a recent Zoom session of the *BCMJ*'s Editorial Board we discussed the topic of peer review. Peer review has been defined as a process of subjecting an author's scholarly work or research to scrutiny by other experts in the same field.

I, like Richard Feynman ("Science is the belief in the ignorance of experts"), have become aware of the dangers of believing in experts, and I have acquired some reservations regarding editorial peer review.

Early in my medical career I was anxious to publish in peer-reviewed journals. In Britain, my promotion as a junior doctor in a university centre required that I "publish or perish." I was fortunate that, within 2 years of graduation, I had published in the two premier British journals, namely the *British Medical Journal* and the *Lancet*. I was pursuing specialty training in both internal medicine and general surgery at the Hammersmith Hospital in London.

Since then I have published over 200 articles, mostly in peer-reviewed journals. Statistical validations in surgery are difficult, and I was proud to co-author what has been referenced as the first-ever randomized prospective blinded study in the field of general surgery. I believed that validated scientific studies were the only ones worthy of publication, and that peer review was reliable.

I became even more involved in the publication and review of articles by serving on the governing board, or as editor or editorial board member, of international journals including eight medical journals. I have always been aware of Mark Twain's famous 1906 comment on editors: "How often we recall, with regret, that Napoleon once shot at a magazine editor and missed him and killed a publisher. But we remember with charity, that his intentions were good."

Despite my involvement on both sides of the peer-review process, I recognize its flaws and limitations. The trend in many prestigious journals, such as *Nature* and *Science*, is to rapidly evaluate the work using a few experienced reviewers, and then expose it quickly and openly to feedback, and possible rebuttal, by other researchers in the field.

Many of the major scientific discoveries in history were rejected by established journals. Only one of Einstein's over 300 publications was peer reviewed. Important landmark papers have been rejected based on bias, or personal disagreement with the results or conclusions. All members of the *BCMJ* Editorial Board are opinionated, and therefore, at risk of displaying bias.

Nobel Prize–winning studies, such as Krebs' work on the citric acid cycle, work on scanning probe microscopy, and radioimmunoassay were initially rejected for publication. Another Nobel Prize paper, "The market for lemons: Quality uncertainty and the market mechanism," was rejected by three journals.

Mistakes occur in the opposite direction as well. A serious example is the early-2000s tragedy when Vioxx was approved for general distribution because the complications and deaths in pre-release studies were "not statistically significant." Statistically significant studies may be insignificant.

According to the *Economist* (despite lacking trust in many economists, I am a subscriber), of 53 previously so-called landmark cancer studies, only six had reproducible results. Another group could validate just a quarter of 67 similarly rated research papers. Post-publication evaluation is now the trend in physics and mathematics. As a United States Supreme Court justice once stated, sarcastically: "This statistical significance always works and always doesn't work."

Journals prefer positive results. Negative results can be more important, but account for relatively few published papers. In the era of Donald Trump, knowing what is not true ("fake news") is as important as knowing what is true. However, if a study with positive results is accepted and published by a journal, there may be less enthusiasm for publishing a subsequent article that fails to replicate the results.

If lightning struck and destroyed a major ancient monument, the event would be front-page news. If it were later discovered that there had been a mistake, and the lightning bolt had missed the monument, the follow-up report would likely be hidden deep inside the newspapers.

When a prominent medical journal editor asked experts to review research papers that she had deliberately riddled with mistakes, she found that almost all of the reviewers failed to spot most of the mistakes.

This is the era of predatory journals, where desperate authors pay to have their papers published. In the past, authoritative journals have published fake research. German physicist Jan Hendrik Schön was a world leader on semiconductors until *Nature*, *Science*, and *Physical Review* retracted 21 of his papers.

My faith in the peer-review process has waned over time but, like democracy as a system of government, it's perhaps better than most of the alternatives.

Note, this editorial has no statistical validity, is written by a non-expert, and has not been peer reviewed. ■

—Brian Day, MB

It seems like such a long journey…

Are we there yet? At this stage in our COVID-19 response, a question like this one is perhaps not a fair one to ask, as the road ahead, and our eventual destination, are constantly changing like the shifting of sand. The pandemic response has been relatively successful in BC, though not without its share of difficulties. This success is in large part due to the strength of collaboration between our physicians, other allied providers, our Provincial Health Officer Dr Henry, our health care administration, and the hard work of British Columbians adhering to public health advice. The effectiveness of our response was particularly noticeable in the suspension and subsequent ramping up of surgical procedures to build capacity for COVID-19 patients, and the creation of PPE protocols to optimize use when our supplies were most critical. Despite our relative success, there are several processes worth examining for potential improvement when it comes to our response in BC and across Canada.

Currently, our access to PPE is reasonable, in both our facilities and community offices, with the exception of impermeable gowns. We can obtain some supplies through our usual suppliers, although at times at a higher cost. When obtaining PPE items through prepandemic channels is not possible, we can source inventory from our health authorities via various agreed-upon processes across BC. Whether this level of supply access will remain dependable during a second wave is unclear. We have at times had as little as a 10-day supply of certain masks and glove sizes at my facility. We are currently holding steady at our present lower burn rate, but I am concerned about higher usage rates in the event of a second wave. Where will that leave our community-based physicians?

As we know, health care in Canada is publicly funded, but largely privately delivered by physicians. Community-based physicians have found the financial burden of the increased PPE demand challenging, even with a large-scale shift to virtual care. Many assessments and procedures, such as vaccines, wound care, surgical assessments or procedures, and obstetrical care, still require in-person delivery, and front-line clinic capacity is limited.

Rising case numbers and growing volumes of contacts in self-isolation in BC throughout August highlighted the need for ongoing public health supports. Although testing capacity has increased across Canada since the pandemic began, a consistent supply of test kits is still lacking, particularly the smaller red-capped kits best suited for children. The numbers we test are not truly declining, and test kit usage is likely to increase. Ongoing streamlining and centralization of testing is likely needed to ensure the entire testing process is optimized.

We know that identifying and isolating individuals exposed to COVID-19 reduces spread, and yet, funding for contact tracing capacity is (in my view) insufficient. Theoretically, an increase in positive cases could further erode the capability of our public health infrastructure to limit spread.

Routine primary care assessments, screening, and treatments have declined, and our patients often wait too long before seeking care. Our emergency rooms continue to see late-presentation cases carrying significant consequences, such as untreated myocardial infarction, stroke, and new cancer diagnoses. Primary vaccination series have fallen behind due to the loss of both public health and primary care clinic time stemming from a lack of PPE, human resources, and safe clinic infrastructure. We need a catch-up plan for these services in the same way we ramped up surgical services back to baseline. To do this, we must support primary care with increased human resources, PPE, and necessary infrastructure to keep patients and providers safe.

We must continue to push for equitable, steady access to necessary supplies, testing, contact tracing, vaccination processes, and safe clinic practices.

Finally, questions have recently arisen around the lack of a domestic vaccine supply, and equitable distribution of available vaccines across Canada. Flu vaccines arrive much later in some areas and in some provinces than others. There are additional serious related concerns surrounding our impending flu and pneumonia season, the safety of school reopening with undervaccinated children, and of course, access and delivery of a SARS-CoV-2 vaccine should one become available.

So, let's not take our foot off the gas just yet. We must continue to push for equitable, steady access to necessary supplies, testing, contact tracing, vaccination processes, and safe clinic practices. We are not there yet. ■

—Kathleen Ross, MD
Doctors of BC President

Brett Baumann, MD, Andrew Churg, MD, FRCPC, Kewan Aboulhosn, MD, FRCPC

Vaping-associated lung injury causing organizing pneumonia: A case report

The case of a 64-year-old male diagnosed with organizing pneumonia after switching from smoking combustible cigarettes to using e-cigarettes. This report highlights the manifestations of e-cigarette–related lung damage as well as a need to increase public awareness about the harmful effects of vaping.

ABSTRACT: A 64-year-old male with no previous history of lung disease presented with intermittent pleuritic chest pain and shortness of breath. The patient had a 20 pack-year smoking history but had recently quit and had started using electronic cigarettes (e-cigarettes). An initial CT scan of his chest revealed right lower lobe opacification with associated ground glass, and over the next 6 months he developed bilateral opacifications in a centrilobular fashion. Infection, connective tissue disease, and cardiac disease were ruled out through preliminary investigations and bronchoscopy. Given the concerns over malignancy, an open lung biopsy was performed and the pathology results indicated an organizing pneumonia. A multidisciplinary team discussion favored a diagnosis of lung injury secondary to inhaled agents or a drug reaction. The patient was found to meet the diagnostic criteria for e-cigarette, or vaping, product use–associated lung injury (EVALI) based on his history of vaping, the presence of bilateral pulmonary infiltrates, and the absence of infection. His symptoms abated with cessation of e-cigarette use, and further intervention was not required. This case of inhalational lung disease secondary to nicotine use through electronic delivery systems raises concerns about the rapid uptake and growth of vaping, especially among adolescents, and the need for product regulation.

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Dr Churg is a professor of pathology at the University of British Columbia and a pathologist at Vancouver General Hospital. Dr Aboulhosn is a respirologist at Island Health and a clinical instructor in the Division of Respiratory Medicine at the University of British Columbia.

This article has been peer reviewed.

Electronic cigarettes (e-cigarettes) are a type of nicotine delivery system that consists of a cartridge that contains a liquid, an atomizer (heating element), and a battery. Commonly used liquids contain various substances, including nicotine, cannabinoids such as tetrahydrocannabinol (THC), flavoring, and additives such as glycerol and propylene glycol.[1] Use of these aerosolized devices (colloquially termed vaping) has risen substantially among the Canadian population, in particular among younger individuals. In 2017, 15.4% of Canadians aged 15 years and older (4.6 million) reported having tried an e-cigarette, and 2.9% (~863 000) had used an e-cigarette in the previous 30 days.[2] Among adolescents in grades 8, 10, and 12 in the United States, vaping prevalence more than doubled in each of the three grades from 2017 to 2019.[3] In 2019, it was estimated that more than 25% of students in the 12th grade in the United States had vaped during the previous 30 days, while 12% of students stated that they vaped daily.[4] Multiple case series were published in autumn 2019 when hospitalizations linked to lung disease and electronic nicotine delivery systems increased throughout the United States. These cases are now known collectively as e-cigarette, or vaping, product use–associated lung injury (EVALI).[4,5] As of November 2019, there have been more than 2800 cases of EVALI in North America, which have displayed a heterogeneous pattern of lung pathology that includes organizing pneumonia, acute respiratory distress syndrome, acute eosinophilic pneumonia, lipoid pneumonia, diffuse alveolar damage, diffuse alveolar hemorrhage, and hypersensitivity pneumonitis.[6] Given the increased incidence and potential severity of EVALI, renewed focus has been placed on the pathophysiology and corresponding health effects of vaping, and on the need for product regulation.

Case data

In July 2017, a 64-year-old male with a 20 pack-year smoking history presented to his family physician with complaints of intermittent pleuritic chest pain and shortness of breath for several months. He had quit smoking combustible cigarettes 4 years previously and had transitioned to an e-cigarette, with increasing daily use. He had used a single variety of nicotine fluid with no THC. He was a retired office

FIGURE 1. Initial chest X-ray from July 2017 showing lung parenchyma, heart, mediastinal structures, and pleura with no abnormalities.

manager and had not traveled recently or had environmental exposures, such as home renovations or living with pets. His medical history included hypertension, diabetes, and dyslipidemia, and his medications included metformin, pantoprazole, candesartan, indapamide, and atorvastatin.

An X-ray of the patient's chest in July 2017 revealed no abnormalities **[Figure 1]**, but a CT scan with contrast in November 2017 revealed right middle and lower lobe opacifications with associated ground glass opacity **[Figure 2]**. Given the clinical and radiographic findings, a broad differential diagnosis that included atypical infections, inflammatory conditions, hemorrhage, and malignancy was considered, and a respirology referral was made.

The patient's cardiovascular and respiratory exam showed no abnormalities, and there was no peripheral stigmata of chronic lung disease. Pulmonary function tests done shortly after the patient's initial CT scan demonstrated an FEV_1 of 2.6 litres (90% predicted) and FVC of 3.7 litres (95% predicted). The ratio of FEV_1 to FVC was low normal at 0.70, and no reversibility was seen with bronchodilators. The patient's bloodwork revealed a CBC with no eosinophilia, and his tests for C-reactive protein, antinuclear antibodies, rheumatoid factor, and antineutrophil cytoplasmic antibodies were all negative, as were tests for hepatitis B and C, and HIV.

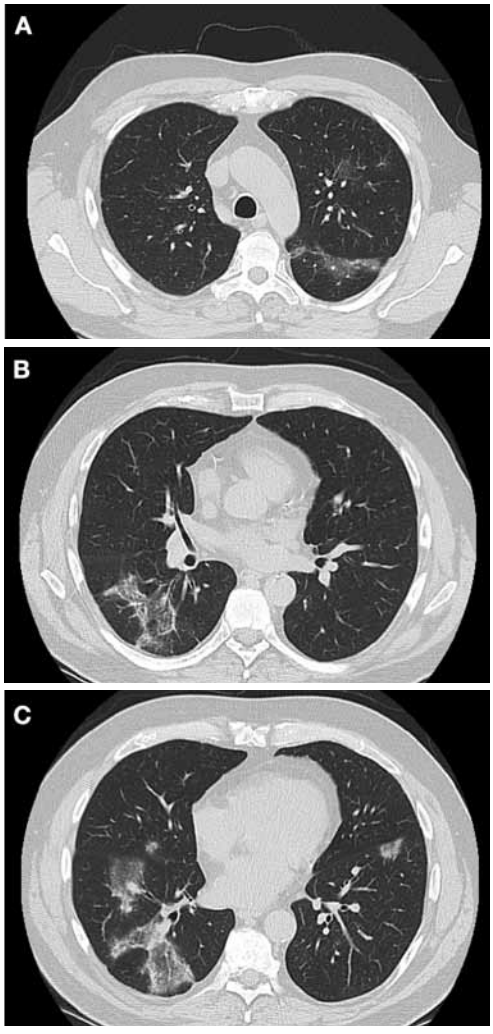

FIGURE 2. Transverse axial CT images of the patient's chest from November 2017 showing nonspecific patchy areas of mixed airspace (A) and ground glass opacity in the right lung (B), and ground glass opacity in the left upper lobe (C).

Because of concerns about malignancy given the patient's smoking history and the initial images obtained, a CT scan of his chest was repeated in January 2018 **[Figure 3]**. Airspace opacities within the right middle lobe and right lower lobe were seen to have persisted and to have increased in size relative to the November 2017 scan. Many of the lesions had peripheral consolidation with central ground glass opacity, known radiographically as the reversed halo sign (atoll sign), a finding specific to organizing pneumonia.[7] Similar patchy airspace opacities had also developed in the left upper and lower lobes. The changing appearance of the patient's lungs on the CT scans over a short interval

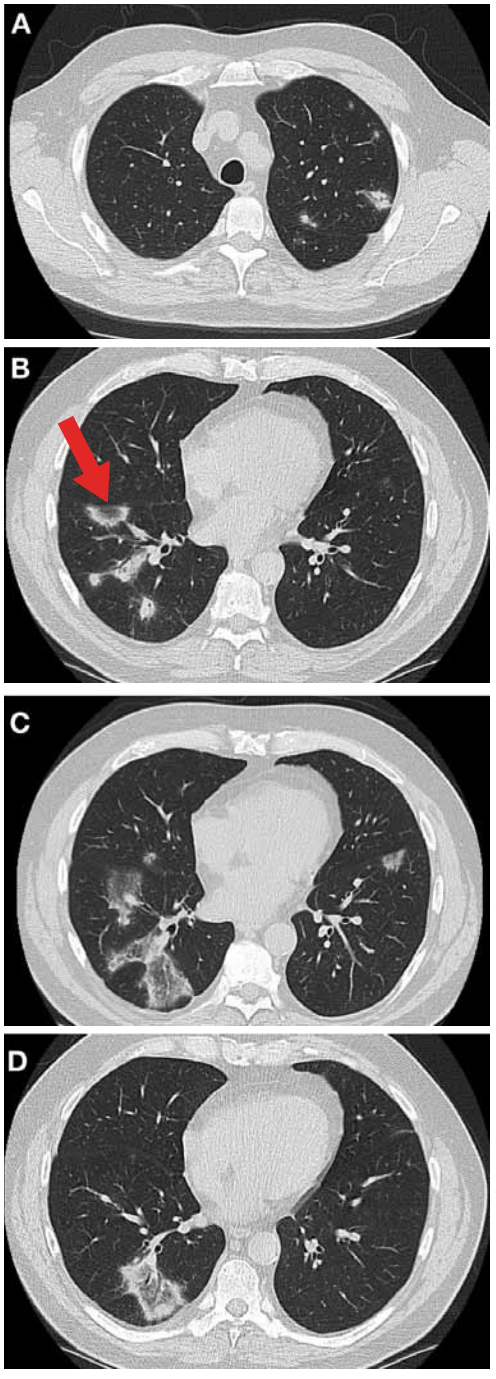

FIGURE 3. Transverse axial CT images from one study of the patient's chest from January 2018. Patchy airspace opacities can be seen in the left upper lobe (A) and airspace opacities within the right middle lobe and right lower lobe (B, C, and D). Many of these lesions have peripheral consolidation with central ground glass opacity (reversed halo/atoll sign; see arrow).

FIGURE 4. Repeat chest X-ray from May 2018 showing right lower lobe opacities with no heart, mediastinal structure, or pleural abnormalities.

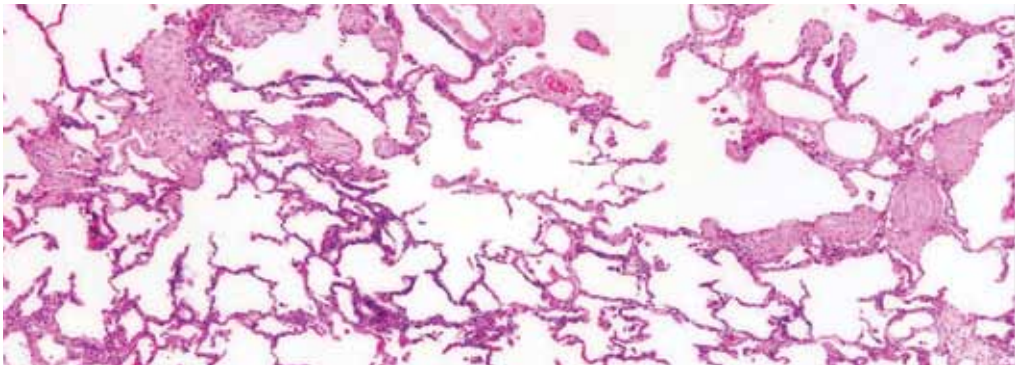

FIGURE 6. A wedge resection sample of the patient's left lower lobe showing cicatricial organizing pneumonia. A few centrilobular patches of mild interstitial fibrosis associated with organizing pneumonia can be seen. In places, the organizing pneumonia has turned into bands of dense collagen.

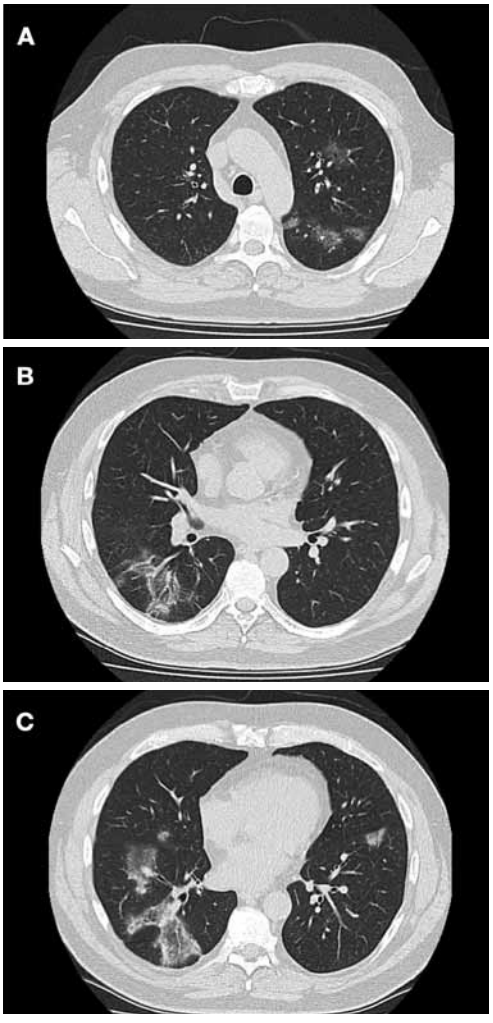

FIGURE 5: Transverse axial CT images of the patient's chest from May 2018. Ongoing evolution of consolidation and central ground glass opacity can be seen in the left upper lobe (A). A wider area of parenchymal involvement can also be seen in the right lower lobe (B). The regions of consolidation in the right lower lobe (C) appear to have more ground glass opacification.

narrowed the differential diagnoses to include organizing pneumonia, eosinophilic pneumonia, vasculitis, pulmonary lymphoma, and alveolar hemorrhage.

After the patient's second CT scan, a bronchoscopy was undertaken to obtain tissue samples by wash, brush, and biopsy. Endobronchial anatomy, including the right lower lobe, showed no abnormalities upon inspection. Bronchoalveolar lavage of the RB6 bronchus (superior segment of the right lower lobe) demonstrated numerous pulmonary macrophages and a moderate number of mixed inflammatory cells. Cultures for bacteria and fungi were negative as were results from a respiratory viral panel, and no antigen was found for *Pneumocystis jiroveci*. Tissue biopsies of the RB9 and RB10 segments showed intra-alveolar macrophages, mild interstitial inflammation, and mild fibrosis.

Given the diagnostic uncertainty and persistent changes in the right lower and left upper lobes on imaging from November 2017 and January 2018, another chest X-ray **[Figure 4]** and additional CT images **[Figure 5]** were obtained in May 2018 to facilitate a wedge resection by thoracic surgery. The new CT scan showed wider areas of consolidation, coalescing lesions in the right lower and left upper lobes, and increasing amounts of associated ground glass opacification. The patient underwent a thoracoscopy and wedge resection of the superior segment of the left lower lobe; pathology from that biopsy showed evidence of cicatricial organizing pneumonia **[Figure 6]**. Interestingly, after the patient ceased e-cigarette use, his symptoms completely resolved over a matter of weeks and were gone prior to his May 2018 CT scan and wedge resection despite radiographic progression. In consultation with the chest radiologists and pathology department at Vancouver General Hospital, lung injury secondary to inhaled agents, a drug reaction, or connective tissue disorders were thought to be the most likely diagnoses given the distinctly centrilobular localization and the odd radiologic waxing and waning over 6 months. He did not require the use of corticosteroids, although he continues to require follow-up with serial CT scans.

Discussion

The patient presented with respiratory complaints consisting of pleuritic pain and intermittent shortness of breath and underwent serological testing, spirometry, and bronchoscopy. Persistent radiographic changes, including bilateral consolidations and associated ground glass opacities, were seen over a 6-month period, and pathology results from a wedge resection of the left lower lobe indicated an organizing pneumonia. Classically, organizing pneumonia has been categorized as cryptogenic or secondary, with secondary causes being related to another lung pathology (vasculitis, hypersensitivity pneumonitis, eosinophilic pneumonia, interstitial lung diseases) or lung injury (infection, drug toxicity, inhalation of toxic gas, aspiration of gastric contents, organ transplant, radiotherapy).[8] The patient underwent extensive testing to rule out secondary causes of his clinical and radiographic features. The consensus diagnosis by a multidisciplinary team favored a drug

reaction or inhalation exposure that caused an organizing pneumonia. A search of the online database Pneumotox for information on the patient's medications indicated that atorvastatin can cause a drug-related interstitial lung disease; however, a large cohort analysis of more than 6000 individuals published in 2013 showed no link between statins and interstitial lung disease.[9] Therefore, other inhalation exposures were considered, with particular focus on the patient's use of e-cigarettes.

A Wisconsin and Illinois cohort series proposed diagnostic criteria for EVALI, which include use of an e-cigarette or related product in the previous 90 days, lung opacities on chest X-rays or CT scan, exclusion of infection, and absence of other likely alternatives such as heart failure or connective tissue disease.[5] In a recent Centers for Disease Control and Prevention report, more than 2800 cases of EVALI and more than 60 related deaths were described.[5] The most common symptoms were cough, shortness of breath, and fatigue; other symptoms included fever, chest pain, weight loss, nausea, and diarrhea.[6] Most of what we know about toxic inhalation syndromes comes from studies of patients with high levels of exposure in occupational settings or from house fires.

At present, there are many questions about the pathophysiology of EVALI. The aerosols produced by e-cigarettes are highly heterogeneous, which makes in vitro models difficult to study. The composition of the aerosol depends on the ingredients in the liquid, the electrical characteristics of the heating element, the temperature reached, and the characteristics of the wick.[10] E-cigarette liquids generally consist of glycerol (vegetable glycerin), propylene glycol, and nicotine.[10] In Layden and colleagues' case series of persons who vaped and developed EVALI, 60% used a combination of THC and nicotine, 27% used THC alone, and 11% used nicotine alone.[5] Vaping fluids containing THC have been formulated with oils, such as vitamin E acetate, whereas most nicotine-only products are mixed with propylene glycol and glycerin.[11,12] Vitamin E has been implicated in the bronchoalveolar-lavage fluid in EVALI patients.[11] Flavoring agents such as diacetyl, which is commonly found in e-fluids containing nicotine, have been shown to cause bronchiolitis obliterans and other severe respiratory diseases in exposed plant workers.[13] However, even though several large cohort studies were published in 2019, no single constituent was common to all cases. Butt and colleagues reviewed lung biopsies from 17 patients, all of whom had a history of vaping and were clinically suspected of having vaping-associated lung injury.[14] In all cases, histopathological findings showed patterns of acute lung injury, including acute fibrinous pneumonitis, diffuse alveolar damage, or organizing pneumonia, as seen in the case discussed in this article.

Currently, there is no standardized treatment for EVALI. Initial treatment usually focuses empirically on more common causes of lung injury, such as infection or underlying lung disease. If EVALI is suspected, most patients are treated with supportive management, including hospital admission and supplemental oxygen if indicated and critical care if progression to acute respiratory distress syndrome occurs. Findings from case series have suggested that patients with worsening hypoxia despite other treatment efforts may benefit from a trial of corticosteroids, but evidence is limited.[5] It is suggested that patients be followed in the community until their symptoms resolve and imaging indicates improvement.[5]

Given our patient's vaping history, investigation results, and radiographic findings, a presumptive diagnosis of EVALI was made. His significant clinical improvement with cessation of e-cigarette use also makes EVALI the most likely explanation for his clinical syndrome.

Summary

A 64-year-old male with no previous history of lung disease underwent investigations after presenting with intermittent pleuritic chest pain and shortness of breath. A multidisciplinary team discussed the laboratory, imaging, and pathology results and concluded that a drug reaction or inhalation exposure had caused organizing pneumonia. The patient's symptoms abated with cessation of his e-cigarette use and further intervention was not required. Based on a history of vaping, the presence of bilateral pulmonary infiltrates, and the absence of both infection and a likely alternative diagnosis, the patient was found to meet the diagnostic criteria for EVALI.

This case and others reported recently demonstrate a link between electronic nicotine delivery systems and chemically induced acute lung injury. This case also highlights questions about the mechanism of toxicity and the unpredictable clinical course of EVALI. Given the dramatic rise in e-cigarette use, especially among adolescents, continued efforts should be made to increase public awareness of the harmful effects of e-cigarettes. ■

Competing interests

None declared.

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Armon Molavi, MD, Sulara Guruge, MD, Peter Kelly, MD

Outpatient treatment of alcohol use disorder

An easy-to-use guide produced as part of a UBC Family Practice Resident Scholar Project supports physicians prescribing medications to treat alcohol withdrawal symptoms and prevent relapse.

ABSTRACT: Alcohol use disorder is highly prevalent and has a significant impact on individuals and society. Research suggests that physicians underutilize medications for relapse prevention even though there is good evidence to support pharmacotherapy for this. Moreover, in outpatient settings, benzodiazepines for alcohol withdrawal are sometimes prescribed in ways that may not be safe. The *Quick Guide to Outpatient Treatment of Alcohol Use Disorder* was created as part of a UBC Family Practice Resident Scholar Project. The guide was developed with feedback from physicians who have experience in addiction medicine, and was subsequently reviewed and approved by the British Columbia Centre on Substance Use to ensure it was consistent with the centre's newly released clinical guidelines. The guide focuses on safe management of alcohol withdrawal in an outpatient setting and on relapse prevention. Physicians can use this supplementary resource along with practice guidelines and clinical judgment.

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This article has been peer reviewed.

Alcohol is the most frequently used intoxicating substance in the world and is responsible for substantial morbidity and mortality.[1] Numerous resources have been committed to managing health issues related to marijuana and opioid use, but in Canada, alcohol use continues to have a much greater societal and economic impact than all illegal drugs combined.[2] Alcohol is legal, highly available, and more socially accepted than other intoxicating substances.

Alcohol use disorder

Alcohol use disorder (AUD) is defined as a problematic pattern of alcohol use leading to clinically significant impairment or distress. It is a common primary care issue affecting approximately 2% to 9% of family practice patients.[3] The 12-month prevalence of AUD in North America is 8.5%.[1] In Canada, at least half of all alcohol consumed is in excess of Canada's Low-Risk Alcohol Drinking Guidelines.[4]

The costs of AUD to individuals and society are immense and include accidents, violence, and suicide, as well as negative impacts on driving, school, work, interpersonal relationships, and physical health.[1]

Treatment of alcohol use disorder

Several studies have shown that treatments for AUD and alcohol withdrawal are underutilized.[5-14] Less than 33% of patients with AUD receive any treatment, and less than 5% receive medications as a part of treatment.[15] Some of the common barriers for physicians include a lack of knowledge about AUD and alcohol withdrawal, a lack of formal training in treating AUD, and a lack of familiarity with different treatment options and the benefits and risks of each option.[5,7-11,13,16,17] There are no clear data on which of these barriers is the most significant in terms of preventing more physicians from treating AUD and alcohol withdrawal in an outpatient setting.

Treatment of AUD includes widely known and well-accepted behavioral intervention programs. However, there is increasing evidence that medications can be used as well for both alcohol withdrawal syndrome and relapse prevention.[6,8,12,14,17-29] The number needed to treat (NNT) to either reduce heavy drinking or increase abstinence from alcohol for the two most commonly used medications (naltrexone and acamprosate) is 10 to 12,[30] which is substantially better than the NNT for medications used for many other medical disorders. However, evidence suggests that these medications are underutilized by prescribers.[5-13,18,19,31]

Traditionally, alcohol withdrawal has been treated with benzodiazepines (BZDs), but there is increasing awareness of problems associated with their use.[8,9,28,29] This has motivated researchers to find safer but still effective alternatives to use in outpatient settings. Evidence for gabapentin in treating mild to moderate alcohol withdrawal symptoms is increasing.[8,14,19-21,23,25,26,32] Head-to-head trials that have compared gabapentin and BZDs have

shown gabapentin is as effective as lorazepam or chlordiazepoxide in treating mild to moderate alcohol withdrawal symptoms.[28,29] Naltrexone, an opioid antagonist, is considered first-line therapy for relapse prevention; it works by reducing the pleasurable and reinforcing effect of alcohol. Acamprosate, a GABA agonist/glutamate antagonist, is also commonly used for relapse prevention; it works by rebalancing neuronal brain changes that occur from chronic alcohol use.[33]

Prior to the 2019 release of the British Columbia Centre on Substance Use (BCCSU) *Provincial Guideline for the Clinical Management of High-Risk Drinking and Alcohol Use Disorder*,[34] there was little readily available information on outpatient management of alcohol withdrawal. The previous BC guidelines outlined an approach for identifying and managing alcohol withdrawal in an outpatient setting, but this approach focused on using benzodiazepines in a home setting.[33] The pharmacological treatment listed in the previous BC guidelines involves using diazepam for acute withdrawal symptoms and then naltrexone, acamprosate, or disulfiram for long-term relapse prevention. UpToDate has information on treating mild alcohol withdrawal with either BZD or gabapentin in an outpatient setting, and provides options for relapse prevention.[35] Other position papers provide information only on BZD use; they have not been updated to include gabapentin or other treatments.[3]

Guide to treating AUD

To address knowledge gaps regarding the treatment of AUD, we created a clinical resource for family physicians to use when considering treatment for a patient with suspected AUD. The *Quick Guide to Outpatient Treatment of Alcohol Use Disorder* **[Figures 1A and 1B]** was developed as part of a UBC Family Practice Resident Scholar Project. The guide focuses on the assessment, treatment, and monitoring of AUD, and relies on the Prediction of Alcohol Withdrawal Severity Scale (PAWSS) scoring system **[Figure 2]** for assessing the risk of alcohol withdrawal syndrome.[36] A 2018 study by St. Paul's Hospital in Vancouver examined the usefulness of various predictive alcohol withdrawal severity scales and found the PAWSS score to be the most useful.[37]

The guide emphasizes the importance of behavioral interventions and provides details on medications that can be used to manage alcohol withdrawal safely in an outpatient setting and how to prevent relapse. Information on using BZDs in withdrawal management and cautions that should be exercised are also provided. Instructions for accessing PharmaCare coverage are included.

The guide is based on previous guidelines,[33] research, and expert opinion from local addiction medicine physicians, and was reviewed and approved by the BCCSU to ensure it was consistent with the 2019 provincial guideline.[34] Development of the guide was inspired by a similar quick reference guide to buprenorphine/naloxone.[38]

The guide was designed for easy use and distribution so that a wide range of primary care providers can become familiar with prescribing certain medications to treat AUD. This will make AUD treatment more accessible and affordable for patients and will improve treatment outcomes. AUD treatment should not have to be limited to specialized care. However, the guide was not designed to be a comprehensive resource, and its users are encouraged to seek support for challenging cases. There may be other treatment options that were excluded from the guide for the sake of simplicity.

While we were unable to critically assess the impact of the guide on prescribing practices during the Resident Scholar Project, we hope that we or another resident group will be able to do so in the future.

Summary

Alcohol is the most frequently used intoxicating substance in the world, and alcohol use disorder is a common primary care issue. Our guide was created to support family physicians in safely treating AUD and managing mild to moderate alcohol withdrawal. The guide focuses on pharmacotherapy and emphasizes the importance of using concurrent behavioral interventions. It can be used as a supplementary resource in an office setting, along with current practice guidelines and clinical judgment. ■

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Competing interests

None declared.

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QUICK GUIDE TO OUTPATIENT TREATMENT OF ALCOHOL USE DISORDER

General Approach – Page 1

START HERE

Assessment

Confirm alcohol use disorder (AUD) using *DSM-5* criteria:[1]
A problematic pattern of alcohol use leading to clinically significant impairment or distress, as manifested by at least two of the following: more use than intended, difficulty cutting down, lots of time spent drinking, cravings, tolerance, withdrawal, continued use despite physical or mental consequences, failure to fulfill major obligations, interpersonal problems, activities given up, use in physically hazardous situations
Mild: 2–3, Moderate: 4–5, Severe: 6 or more (within 12-month period)

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Substance use history with special attention to other sedatives (e.g., opioids, benzodiazepines), past treatments, patient's goals, and barriers

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Consider **complete physical** to assess medical complications of alcohol use

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Review **investigations** (special consideration to ALT, AST, GGT, creatinine/GFR, MCV, urine drug screen, HIV, hepatitis C)

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Treatment

Consider detox if patient is willing and if appropriate (see next page)

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Moderate to severe AUD: Offer trial of naltrexone or acamprosate to reduce drinking/support patient's abstinence while considering contraindications and patient factors. Provide all patients with information on and referrals to **psychosocial treatments** and community-based supports

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Trial medication: titrate or switch as needed

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Monitoring

Aim to continue medication for **6–24 months**

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Regular **follow-up** appointments to offer support, monitor progress and relapses

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Encourage engaging in recovery community and **psychosocial supports**

Psychosocial supports:

- Patients benefit from access to comprehensive treatment approach, including medication, primary care visits, and community-based psychosocial supports
- **Psychosocial supports:** counseling, group therapy, mutual help groups (12-step [e.g., AA] or secular [e.g., SMART Recovery, LifeRing]), inpatient treatment facilities, intensive outpatient day programs
- Motivational interviewing is an evidence-based approach that family physicians can use to help patients achieve their goals
- Family physicians can consider billing counseling and mental health planning fees

Medication coverage:

- **Collaborative Prescribing Agreement**:[2] Search Internet for "BC Naltrexone"
- Obtain complete coverage of naltrexone and acamprosate for patients who are covered by PharmaCare
- Consider completing **Plan G** if not under PharmaCare already
- Complete one form per prescriber; does not need to be redone for each patient
- One-page form that takes 1 minute to complete

Medications:

Naltrexone:

- Opioid antagonist; reduces pleasurable effect of alcohol
- NNT = 10–12 to reduce heavy drinking
- Typically first line due to simple dosing
- **25 mg PO daily × 3 days, then increase to 50 mg**
- Usual dose is 50 mg, rarely up to 150 mg; sometimes used as PRN on drinking days when stable
- Can start at any time **(no need to abstain from alcohol)**
- Contraindications: concurrent opioid use (consider Rx or illicit), severe liver dysfunction
- Side effects: N/V, headache, fatigue
- Check liver enzymes at baseline and 6 weeks; use caution if enzymes elevated at baseline

Acamprosate:

- GABA agonist/glutamate antagonist; rebalances neuronal brain changes from chronic alcohol use
- NNT = 10–12 to increase days of abstinence
- **333 mg PO TID × 1 week, then 666 mg PO TID**
- Can start at any time but may be more effective if started after at least 4 days of abstinence
- Contraindications: severe renal failure
- Side effects: diarrhea (common), nausea, headache

Medication notes:

- If patient relapses, they should still continue medication
- Disulfiram (Antabuse) rarely used anymore; exceptions include patient request and/or use in supervised setting
- Emerging evidence for topiramate and gabapentin
- Pregnancy: safety of either is not well established; balance risk of ongoing use

[1]Please refer to full *DSM-5* criteria
[2]https://www2.gov.bc.ca/assets/gov/health/health-drug-coverage/pharmacare/acamprosate_and_naltrexone_cpa_1_year.pdf

FIGURE 1A. Guide created to address knowledge gaps regarding outpatient treatment of alcohol use disorder (page 1 of 2).

QUICK GUIDE TO OUTPATIENT TREATMENT OF ALCOHOL USE DISORDER

Alcohol Withdrawal as an Outpatient – Page 2

Considering patient for detox from alcohol

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Assess Prediction of Alcohol Withdrawal Severity Scale[1] (PAWSS) score

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PAWSS < 4

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Low risk for severe alcohol withdrawal syndrome

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Suitable for trial of outpatient treatment if no contraindications. Follow guidelines below; consider using gabapentin for symptomatic relief

PAWSS ≥ 4

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High risk for severe alcohol withdrawal syndrome

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Refer for inpatient treatment in detox facility or hospital

Tips for managing outpatient alcohol withdrawal

- Patient should have a reliable caregiver or access to intensive community support program (e.g., Daytox)
- Start early in the week and assess the patient daily × 3–4 days for vitals, withdrawal symptoms, hydration, orientation, sleep, and general condition
- Consider prescribing **gabapentin 300 mg PO TID** for withdrawal symptoms; can add 300 mg PRN per dose to a maximum of 1800 mg and consider daily dispensing, caution in renal impairment
- Prescribe **thiamine 100 mg PO TID × 1 week**, then daily × 2 months, as well as a daily multivitamin (may need to pay out of pocket)

Contraindications to outpatient management include:

- Any history of withdrawal seizure or delirium
- Unstable medical or psychiatric conditions
- Concurrent sedative use disorders
- Pregnancy
- Multiple failed attempts
- Lack of safe setting, caregiver, or intensive community support program

Note on benzodiazepines:

- Benzodiazepines are the gold standard for managing alcohol withdrawal
- However, they pose significant risk in an unsupervised setting, including abuse, oversedation, respiratory depression, falls, delirium (especially if patient relapses to drinking)
- 80% of alcohol withdrawal syndrome does not require aggressive medical intervention, such as with benzodiazepines; hence why we screen with PAWSS
- Anticonvulsants, such as gabapentin, have been shown to be safer and are effective for mild to moderate withdrawal symptoms

References and Resources:

- Created by Armon Molavi, MD, Sulara Guruge, MD, and Peter Kelly, MD, BC family physicians
- Adapted from *Provincial Guideline for the Clinical Management of High-Risk Drinking and Alcohol Use Disorder* (http://www.bccsu.ca/care-guidance-publications/) with clinical input from addiction medicine specialists
- For consultative support, contact the RACE line for Addiction Medicine: **1-877-696-2131**
- To test your knowledge and/or provide feedback on the handout, go to https://www.surveymonkey.com/r/D2YKM97

[1]Prediction of Alcohol Withdrawal Severity Scale is an evidence-based screening tool for assessing the likelihood that a patient will experience severe alcohol withdrawal syndrome: https://www.mdcalc.com/prediction-alcohol-withdrawal-severity-scale
A digital copy can be accessed at https://tinyurl.com/audhandout

FIGURE 1B. Guide created to address knowledge gaps regarding outpatient treatment of alcohol use disorder (page 2 of 2).

Prediction of Alcohol Withdrawal Severity Scale (PAWSS)

Maldonado et al., 2014

Part A: Threshold criteria: (1 point each)

1. Have you consumed any amount of alcohol (i.e., been drinking) within the last 30 days? OR did the patient have a "+" BAL upon admission? _____

IF the answer to either is YES, proceed with test:

Part B: Based on patient interview: (1 point each)

2. Have you ever experienced previous episodes of alcohol withdrawal? _____
3. Have you ever experienced alcohol withdrawal seizures? _____
4. Have you ever experienced delirium tremens or DTs? _____
5. Have you ever undergone of alcohol rehabilitation treatment? (i.e., in-patient or out-patient treatment programs or AA attendance) _____
6. Have you ever experienced blackouts? _____
7. Have you combined alcohol with other "downers" like benzodiazepines or barbiturates during the last 90 days? _____
8. Have you combined alcohol with any other substance of abuse during the last 90 days? _____

Part C: Based on clinical evidence: (1 point each)

9. Was the patient's blood alcohol level (BAL) on presentation > 200? _____
10. Is there evidence of increased autonomic activity? (e.g., HR > 120 bpm, tremor, sweating, agitation, nausea) _____

Total Score: _____

Notes: Maximum score = 10. This instrument is intended as a SCREENING TOOL. The greater the number of positive findings, the higher the risk for the development of alcohol withdrawal syndromes. A score of ≥ 4 suggests HIGH RISK for moderate to severe AWS; prophylaxis and/or treatment may be indictated.

FIGURE 2. Prediction of Alcohol Withdrawal Severity Scale developed by Maldonado and colleagues.[36]

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British Columbia's COVID-19 experience

BC's success in managing COVID-19 to date can be attributed, in part, to a timely and comprehensive public health response.

ABSTRACT: Since the emergence of COVID-19 in late 2019, health care systems around the world have been dealing with the pandemic. Mortality rates of patients admitted to ICUs and placed on mechanical ventilators were a concern initially. We sought to compare the burden of disease that BC has experienced with that of other Canadian provinces and other countries. In March 2020, 66.7% of the COVID-19 deaths in Canada had occurred in BC, but by 11 July 2020, the proportion had declined to 2.1%. In April 2020, critical care mortality and mechanical ventilator mortality of New York patients with COVID-19 was 78.0% and 88.1%, respectively. As of 8 July 2020, critical care mortality and mechanical ventilator mortality of BC patients with COVID-19 were 16.6% and 15.4%, respectively. Overall, BC has experienced a lower burden of disease and significantly lower critical care mortality than described in initial reports from China, Italy, and New York. This is likely due, in part, to a timely public health response that included broad early testing and case and contact management, travel and mass gathering restrictions, physical distancing measures, and prevention of "superspreader" events. BC has also benefited from decisive action by hospital administrators, and the sharing of data and resources such as ventilators and personal protective equipment. To ensure that inpatient mortality in ICUs does not increase in the event of another wave of COVID-19, contingency plans must be put in place. Capacity should be built into the system so that staff-to-patient ratios allow for optimal patient care, personal protective equipment is available to protect staff, and isolation room availability is increased.

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A novel coronavirus, SARS-CoV-2, was first identified in December 2019 and resulted in cases of pneumonia in Wuhan, China.[1] Since then, SARS-CoV-2 has spread rapidly around the globe. On 11 March 2020, the World Health Organization declared COVID-19 a pandemic.[2] As of 6 September 2020, more than 27 million people worldwide have been infected and more than 900 000 have died.[3]

Jurisdictions compared

Initial reports from China showed mortality rates ranging from 38.0% to 97.0% for patients in ICUs.[4,5] On 22 April 2020, Richardson and colleagues reported that 320 of 2634 patients with COVID-19 in the New York City area (12.2%) required mechanical ventilation.[6] In that case series there was a 78.0% mortality rate for patients who were admitted to the ICU and an 88.1% mortality rate for patients who required mechanical ventilation.[6]

The experience with COVID-19 in BC has been different than in other jurisdictions. Although BC has approximately 13.4% of the Canadian population,[7] on 20 March 2020, the province recorded 29.0% (n = 271) of Canada's COVID-19 cases and 66.7% (n = 8) of the country's COVID-19 deaths.[8] However, by 11 July 2020, BC had recorded 2.8% (n = 3053) of Canada's COVID-19 cases and 2.1% (n = 187) of the country's COVID-19 deaths.[9] As of 8 July 2020, 16.6% (36 of 217) of critical care COVID-19 patients in BC had died, and 15.4% (20 of 130) had died while mechanically ventilated, according to Provincial Health Services Authority data.

Initially in March 2020, BC testing focused on sicker patients and health care workers. This led to concern that subsequent case counts could underestimate the size of the epidemic; however, universal testing of suspect patients resumed on 21 April 2020. As of 11 July 2020, the cumulative testing rate in BC was approximately 3.6% of the population, compared with 10.9% in Ontario and 7.9% in Quebec.[9]

Hospital admission rates, which may represent a more accurate, albeit delayed, account of COVID-19 trends in BC than confirmed cases, have not dramatically increased as initially projected. During May and June 2020, admission rates decreased or were constant, likely the result of timely and stringent physical distancing measures.[8]

Overall, BC has experienced a lower burden of disease and significantly lower critical care mortality than described in initial reports from China, Italy, and New York.

Public health response

BC's success in limiting the spread of COVID-19 and avoiding an initial hospital bed resource crisis is likely due to a timely public health response and some unknown variables. The public health response included broad early testing and case and contact management, travel and mass gathering restrictions, physical distancing measures, and prevention of "superspreader" events.

The first case in BC was recorded on 28 January 2020 and involved a traveler returning from Wuhan.[10] On 7 March 2020, the first two cases at the Lynn Valley Care Centre in North Vancouver were reported.[11] One resident and one staff member were diagnosed; the staff member was likely Canada's first case of community transmission. By 13 March 2020, the Canadian government had recommended against international travel.[12] On 17 March 2020, a BC public health emergency was declared, and a province-wide state of emergency was declared the next day.[13,14] Since May 2020, there have been very few new hospitalizations or critical care admissions in BC.

Case fatality, critical care admission, the need for mechanical ventilation, and the duration of mechanical ventilation are important indicators of the severity of illness, the burden on the health care system, and the ability of patients to regain quality of life postinfection. Management of patients who are critically ill with COVID-19 is emergent and based mostly on first principles, with clinicians around the world collaborating and sharing their experience because of a lack of high-quality randomized control trial data. Most COVID-19 patients in BC are cared for in tertiary or quaternary critical care units and are managed by specialty-trained (fellowship) intensive care physicians. Managing patients with COVID-19 can involve additional delays in care related to the need to use personal protective equipment (PPE) to prevent disease transmission to health care staff and the need for a high index of suspicion regarding complications and deterioration. Given the new stressors and potential delays in care, maintaining and even increasing the ratio of health care providers to patients has been required, specifically in our dedicated COVID-19 units.

Decisive action by hospital administrators and a collaborative provincial response allowed hospitals in BC to create capacity by limiting the number of elective surgeries and transplant programs. This process was aided by multiple collaborative groups and committees with widespread representation of various specialties, including the BC COVID-19 Therapeutics Committee. Also, new physical space and capacity for ventilated and critically ill patients was created by restructuring areas of care. Having critical care nurses, respiratory therapists, physiotherapists, dietitians, and pharmacists working alongside intensive care specialists who had a manageable patient load and were not limited by the number of critical care beds may have resulted in lower mortality rates than previously reported. As a result of diligent preparation and PPE training by ICU managers and directors, the largest ICU in BC, which employs more than 200 allied health practitioners, had zero confirmed cases of COVID-19 transmission from patient to staff from late January to late June 2020.

Planning is imperative to ensure that inpatient mortality in ICUs in BC follows the current rates, which are in stark contrast to those reported around the world.

BC was also able to mobilize intensivists from its various health authorities through the coordination of the British Columbia Critical Care Working Group supported by the BC Patient Safety and Quality Council. Mobilizing the previously created provincial network allowed for the sharing of data and resources such as ventilators and PPE, and supported the creation of a real-time provincial COVID-19 capacity and resource critical care dashboard. The regular clinical sharing this permits has fostered further collaboration and contributed to overall enhanced care.

Plans for the future

We have undoubtedly been lucky in our experience to date and should not take credit for factors outside of our control. Modeling shows there is considerable potential for further waves of COVID-19 transmission in the months and years to come.[15] The creation of a vaccine is likely many months away, and we are almost certainly well below a herd immunity threshold.[16] Governments will be forced to balance the benefits of public health measures and their economic and physical health/mental health impacts.

While necessary in the short-term, the diversion of ICU capacity to COVID-19 care has jeopardized our standard of care and resulted in a backlog of testing and therapies for other illnesses, which may result in worsening prognoses and morbidities, and a late increase in critical care admissions.[17,18] Prior to the COVID-19 pandemic, most ICUs operated near 100% capacity year-round, and capacity was often crippled by the lack of isolation room availability. Now that some of the capacity for handling COVID-19 cases has been released for other care, contingency plans must be put in place in case another large wave occurs.

In the future, capacity should be built into the system so that staff-to-patient ratios allow for optimal patient care, PPE is available to protect staff, and isolation room availability is increased.[19] Such planning is imperative to ensure that inpatient mortality in ICUs in BC follows the current rates, which are in stark contrast to those reported around the world. ■

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Competing interests

None declared.

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Communication between physicians and WorkSafeBC medical advisors

An attending physician may request to consult a medical advisor for their patients who have submitted a WorkSafeBC claim for a workplace injury, occupational disease, or mental health condition. Physicians may request assistance with referrals and imaging, ask about the claim's status, request clarification about or assistance with WorkSafeBC documentation, or discuss the claims process in general. Similarly, medical advisors may need to contact the responsible physician to discuss clinical care plans for injured workers. To streamline this process and to avoid delays in processing the request for consultation, follow the suggestions below.

Identify why you are requesting contact. In addition to checking the "Do you wish to consult with a WorkSafeBC physician or nurse advisor?" box on the Physician's Report (Form 8/11), identify in the body of the report why you are requesting contact (e.g., to request imaging, to make a referral, or to discuss medication, claim status, or other specified patient concerns). This will help WorkSafeBC medical advisors address your queries more effectively.

Provide a phone number and, if necessary, the best time of day to reach you. This is especially important if you are a locum or emergency physician without a dedicated office number or if you work in multiple facilities.

Turn off the default setting requesting consultation. Some electronic medical records systems are defaulted to automatically check the box requesting consultation with a medical advisor. Please check your forms and, if possible, turn off this default setting so you don't receive unnecessary calls.

Call if you need a quick response. For matters that require a quick response, call the medical advisor's contact number: 1 855 476-3049. This is monitored from 8:30 a.m. to 4:30 p.m., Monday to Friday, but you can leave a message at any time and get a callback within 1 to 2 days. This phone number is not intended to provide clinical advice in an acute setting. Patients requiring urgent care should be sent to the ER.

You can also call any medical advisor in your region, who can direct you to the most appropriate medical advisor or claim owner.

Expedite imaging. If you need a medical advisor's assistance with expediting imaging, send the requisition to WorkSafeBC along with your Form 8/11. Note what the imaging is for and the claim number on the requisition. Fax requisitions to 604 233-9777 or 1 888 922-8807, or mail them in.

Contact the claim owner for status or decisions. Concerns about the claim status or decisions are best answered by the claim owner (entitlement officer, case manager, or return-to-work specialist). However, the medical advisor can summarize the claims process and provide you with contact information for the claim owner.

Make use of our outreach program. For detailed information about WorkSafeBC billing, disability assessment and management, or WorkSafeBC resources for injured workers, use our outreach program (Patient Care, Physicians and WorkSafeBC). We can come to your office and tailor a presentation to meet your needs. This academic detailing is available to and accredited for family doctors and specialists and is delivered by medical advisors or billing specialists. For more information, call 1 855 476-3049, email clinicalservicesevents@worksafebc.com, or contact a medical advisor.

We can come to your office and tailor a presentation to meet your needs.

Have a protocol for our calls. We understand how busy you are. To maximize efficiency, have a protocol in place with your office staff for calls received from a WorkSafeBC medical advisor. Let your staff know whether they should interrupt you at the time of the call or set up a more convenient time for a callback. The medical advisor may send you a fax noting their contact information and working hours to help set up a mutually convenient time.

Note that calls are billable. Phone calls with WorkSafeBC personnel are billable, providing they advance your patient's care or claim. Use billing code 19508 when you speak with a medical advisor. ■

—Karima Jiwa, MD, CCFP, FCFP
Medical Advisor, Medical Services

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

e-Prescribing is an important tool in supporting continuity of care

By: Dr. Dominik Nowak

Image: [© Ronstik] / Adobe

Throughout the COVID-19 pandemic, my colleagues and I rely on virtual care to connect with people in our practices. Despite advances in digital health, most of my communications with other members of the care team still involve fax machines or e-fax. Although improving communication quality in healthcare is a complex challenge, electronic prescribing is a near-term way to communicate more reliably, uphold continuity of care, and begin the shift toward a fax-free future.

The unfortunate reality is that I cannot trust my fax machine. Fax is an unreliable and insecure legacy system in healthcare, a system I equate to our modern-day messenger pigeon. What I mean is, I know that my faxes will probably get to where I need them to go, just as if I were sending a messenger pigeon. However, I never know for sure. Especially in our shift toward virtual care, it is more important than ever that we have full confidence that our communications are reliable and secure. When it comes to caring for the health of people in my practice, fax is egregiously inadequate.

As a family physician, I also know how critical continuity of my care is to people in my practice. By continuity, I mean the ability for a person under my care to see the same clinician or care team, together building trust, safety, and quality. More broadly, continuity also means that all members of a person's care team must have the ability to communicate and develop a shared understanding of a person's care. Canadians deserve to have care teams whose members are roughly following one plan based on one set of information. They also deserve the ability to access the medical knowledge of their team from any touchpoint in the healthcare system. However, this kind of informational and care team continuity is attainable only with forward-thinking communications.

A major benefit of e-prescribing to my practice is its impact on continuity. By e-prescribing, I can send an electronic prescription to a person's preferred pharmacy directly from the medical record. I can see the prescription fill date, and have confidence that my prescription arrived at its destination. I am also able to text message a person's pharmacy directly from the chart. I can easily reach out to the pharmacist to find out about a person's medication history, ask a clinical question, or otherwise coordinate care. Pharmacists can connect with me for a renewal or a medication review. Electronic prescribing allows me the opportunity for dialogue, and thus the ability to care for people in my practice in a more continuous, coordinated, and comprehensive way.

As we look to improve health systems to provide the best possible care for Canadians, an urgent step is modernizing how we communicate with each other. Our communications systems cannot be relics of a past world. Rather, they must work to bring shared understanding to clinicians and care teams, as well as trust and safety to the people, families, and caregivers we serve. To this end, it is time to get rid of healthcare's messenger pigeon. It is time to remove the need for fax, and instead dream of more reliable and innovative communication.

Dr. Dominik Nowak is a comprehensive family physician in Toronto. He is a recognized leader in primary care and health systems strategy. Outside of clinical practice, Dr. Nowak brings his lens as a family doctor to his roles as a trusted advisor to Canada Health Infoway and several other Canadian organizations.

Prednisone prescribing habits in the emergency room to treat rash

A retrospective medical chart review of skin rash cases presented to the ER suggests a need for further education on diagnosing and treating common dermatologic presentations and providing appropriate follow-up for acute skin disorders.

Rochelle Tonkin, MD, Christopher Sladden, MBBCh, MRCGP, FRCPC

ABSTRACT

Background: A visiting dermatologist at a small community hospital in Northern BC observed an increase in the number of patients who were treated with prednisone for skin rash following an ER consult. In some cases, this was considered to be inappropriate and/or there was inadequate follow-up. The primary purpose of this study was to determine the prevalence with which prednisone was prescribed for nonspecific dermatology diagnoses in ER patients at the University Hospital of Northern BC (UHNBC), and the prevalence of follow-up referrals for those patients.

Methods: A retrospective medical chart review of patient visits to the UHNBC ER that presented with "rash and other nonspecific skin eruption" between 1 January 2016 and 31 December 2018 was conducted.

Results: Of those patients who were diagnosed with nonspecific rash in the ER (N = 463), 10.4% were prescribed prednisone. Most of those patients received nonspecific (45.8%) or uncertain (25.0%) diagnoses; 29.2% were given specific diagnoses. Most patients who were prescribed prednisone received a follow-up referral to a family physician (56.3%) or were referred to other health care providers (4.2%), a family physician who had an interest in dermatology (2.1%), or a dermatologist (2.1%). The rest did not receive a follow-up referral (35.4%).

Conclusions: We suspect that prednisone was used empirically to treat nonspecific or uncertain diagnoses of skin rashes in the UHNBC ER. This may have been related to a limited availability of dermatology services and support, and suggests a need for further education on using current guidelines for treating dermatological conditions and the importance of providing follow-up referrals for patients treated with prednisone.

Dr Tonkin is a graduate of the Northern Medical Program (class of 2020) at the University of British Columbia and is associated with the University Hospital of Northern BC. Dr Sladden is a clinical instructor in the Department of Dermatology and Skin Science at the University of British Columbia and is a visiting dermatologist at the University Hospital of Northern BC.

This article has been peer reviewed.

Background

Dermatology cases made up approximately 3.3% of all cases that presented to the emergency room (ER) in an Ontario study.[1] The most common skin presentations were skin infections, of which cellulitis was the most prevalent.[1,2] A US study found that 9.01% of adult dermatology cases that presented to the ER were diagnosed as "rash and other nonspecific eruption."[2] Thus far, these types of statistics have not been reported for BC or Canada.

The term "rash" is commonly used to describe skin conditions, which according to the *Oxford Concise Medical Dictionary* are defined as "a temporary eruption on the skin, usually typified by discrete red spots or generalized reddening, that may be accompanied by itching," as well as "a local skin reaction or the outward sign of a disorder affecting the body."[3] Additionally, the *British Medical Journal* Best Practice Guidelines state that "The term 'rash' is also nonspecific and is sometimes incorrectly applied to any skin finding; 'eruption' may be preferred for a cutaneous reaction of acute onset."[4] Alternatively, "maculopapular rash," "exanthematous eruption" (exanthem), or "morbilliform eruption" are other nonspecific terms commonly used incorrectly to indicate any rash and can present as a "diagnostic challenge to the clinician."[4]

Systemic corticosteroids are a mainstay of dermatologic therapy because of their potent immunosuppressive and anti-inflammatory properties, and are frequently used for severe dermatologic diseases. The most common indications for the use of systemic steroids to treat skin diseases are serious conditions such as blistering disease (e.g., pemphigous, bullous pemphigoid), connective tissues diseases (e.g., dermatomyositis, systemic lupus erythematosus), vasculitis, neutrophilic dermatoses, sarcoidosis, and urticaria/angioedema.[5] In addition, short courses of glucocorticoids may be used for a variety of forms of severe dermatitis, including contact dermatitis, atopic dermatitis, photodermatitis, exfoliative dermatitis, and erythrodermas.[5]

Prednisone is an oral corticosteroid drug that can cause many serious side effects. Common adverse drug reactions (≥ 1%) when prednisone is used long term include hypertension, Cushing syndrome, impaired growth, hyperglycemia, adrenal suppression, gastrointestinal ulcer, osteoporosis, cataracts, glaucoma, and depression.[6,7] Oral corticosteroids are generally considered to be safe when used in short-term doses (less than 3 weeks duration), and are commonly used for acute presentations in the ER. Although rare, there are risks associated with short-term use, such as avascular necrosis, fatal varicella zoster in immunocompromised patients, severe mood changes, and psychotic reactions;[8] however, corticosteroid courses of less than 1 week duration that are prescribed in the absence of specific patient contraindications are unlikely to cause harm (except possibly for psychotic or prepsychotic episodes).[8] Because of these risks and the possibility that patients could experience additive effects from receiving multiple short-term corticosteroid courses over time, close monitoring of patients and tapering the schedule of treatment may be required, which can be done by a family physician or specialist. Inappropriate prescribing and lack of follow-up can lead to patient safety issues.

In a small community hospital in Northern BC, a visiting dermatologist observed an increase in the number of patient referrals for nondescriptive dermatology conditions such as "rash" over the course of a year, for which prednisone was prescribed following an ER consult. In some cases, this was considered to be inappropriate and/or there was inadequate follow-up.

There is a paucity of research in the current literature on prescribing prednisone to treat nondescriptive dermatology conditions. An investigation of diagnostic and prescribing practices for dermatology conditions in the ER might prove beneficial, because in Northern BC, many communities do not have a full-time dermatologist and instead rely extensively on ER physicians to treat dermatology patients. Enhancing this knowledge may also help guide future dermatology training initiatives for medical students, residents, and current ER physicians.

The primary purpose of this study was to determine the prevalence of nonspecific dermatology diagnoses such as rash and maculopapular rash given to patients who presented to the ER at a small hospital in Northern BC and the prevalence with which prednisone was prescribed to treat those patients. We were also interested in determining how many of those patients were referred to a dermatology specialist or family physician to follow up on the diagnosis and/or treatment.

We hypothesize that ER physicians may give nondescriptive diagnoses such as rash and maculopapular rash to patients with dermatologic conditions rather than specific true diagnoses. We also hypothesize that a number of those patients who are not given a clear diagnosis are empirically treated with prednisone, which in some cases may not be appropriate. In addition, we suspect that many of those patients may not be referred to a specialist for follow-up.

Methods

Research design

A retrospective medical chart review was conducted to measure the prevalence of nonspecific dermatology diagnoses such as rash that were treated with prednisone, as reported in ER clinical encounter records from University Hospital of Northern British Columbia (UHNBC). The review focused on patients seen in the ER for dermatology conditions (ICD-10 Code R21: Rash and other nonspecific skin eruption) at UHNBC between 1 January 2016 and 31 December 2018. Information collected included patient age, gender, diagnosis, treatment, and referral.

Data collection and analysis

The ER encounter medical charts were reviewed with assistance from Northern Health's Health Information Management Services (HIMS) department, and the data were catalogued into an anonymized database. Excel software was used to analyze the data and perform descriptive statistics. Ethics approval was received from the University of British Columbia, the University of Northern British Columbia, and Northern Health H19-01950.

Results

Between 1 January 2016 and 31 December 2018, 463 patients were seen in the ER for rash and nonspecific skin eruption. Patient demographic information, certainty/specificity of diagnoses, and referral rates are provided in the **Table**. Approximately 66% of patients were given a nonspecific or uncertain diagnosis; about one-third received specific/certain diagnoses. Approximately half of the patients were referred to a family physician for follow-up; another 10% were referred to other health care providers, a dermatologist, or a family physician who had an interest in dermatology. Approximately 40% of the patients were not given a follow-up referral to a health care provider.

The most common treatments prescribed for rash or nonspecific skin eruption—sedating antihistamines, such as diphenhydramine (Benadryl) or hydralazine (Atarax), and supportive therapies **[Figure 1]**—accounted for almost half of all treatments prescribed. Other prescribed treatments included topical treatments, followed by other therapies, oral antibiotic/antifungal/antiviral treatments, prednisone, nonsedating antihistamines, other systemic corticosteroids, further investigations with a biopsy, and IV antibiotics. In approximately 18% of cases, no therapy or further monitoring was prescribed.

Approximately 10% (n = 48) of patients who were diagnosed with rash and nonspecific skin eruption were prescribed prednisone **[Table]**. Similar to all patients who were diagnosed with rash and nonspecific skin eruption, most patients (~71%) who were treated with prednisone were given a nonspecific or uncertain diagnosis; the rest received specific/certain diagnoses. Slightly more than half of patients who were treated with prednisone were referred to a general practitioner; another 8% were referred to other health care providers, a dermatologist, or a family physician with an interest in dermatology. Approximately one-third of patients who were treated with prednisone were not given a follow-up referral to a health care provider.

The percentage of rash cases in the ER that were treated with prednisone more than doubled from 2016 to 2017, then declined somewhat from 2017 to 2018 **[Figure 2]**.

Conclusions

Systemic corticosteroids were prescribed for 14.1% of patients who presented to the ER

TABLE. Information for patients diagnosed with a rash at the University Hospital of Northern BC emergency room between 1 January 2016 and 31 December 2018 and those who were prescribed prednisone.

		All patients (N = 463) % (n)	Prednisone prescribed (N = 48) % (n)
Sociodemographic characteristics			
Age group	0–19	42.3 (196)	4.2 (2)
	20–39	21.6 (100)	22.9 (11)
	40–59	21.6 (100)	41.7 (20)
	60–79	11.9 (55)	22.9 (11)
	80–99	2.6 (12)	8.3 (4)
Gender	Male	47.1 (218)	43.8 (21)
	Female	52.9 (245)	56.3 (27)
Rash cases			
Certainty/specificity of diagnoses	Nonspecific	30.7 (142)	45.8 (22)
	Uncertain	35.0 (162)	25.0 (12)
	Specific	34.3 (159)	29.2 (14)
Referrals*	Family physician	51.6 (239)	56.3 (27)
	No referral	39.7 (184)	35.4 (17)
	Other	8.0 (37)	4.2 (2)
	Family physician dermatology	0.4 (2)	2.1 (1)
	Dermatology	1.7 (8)	2.1 (1)

*In some cases, patients were referred to more than one provider type.

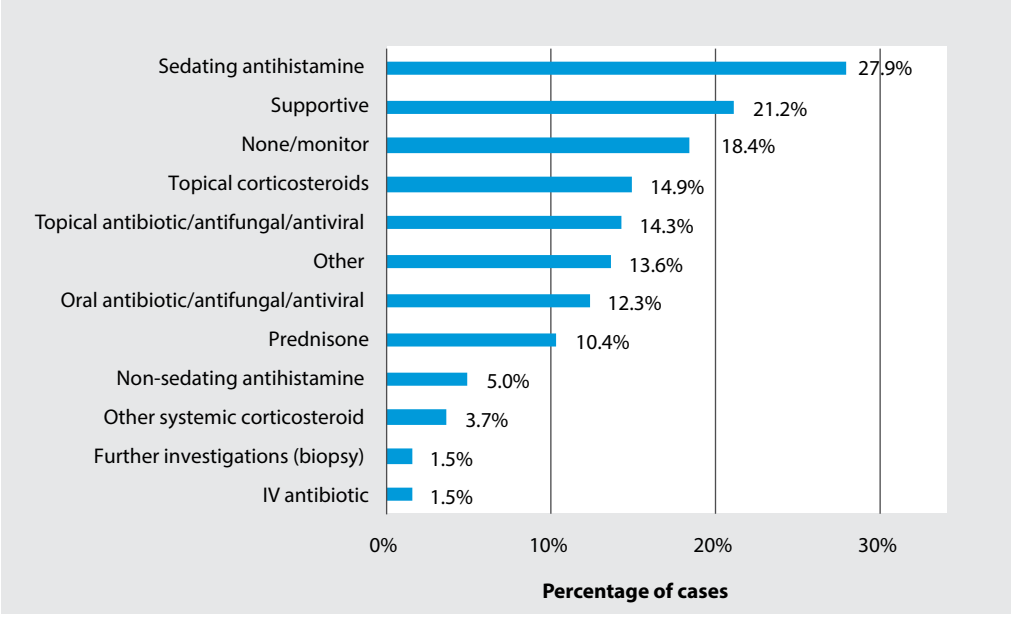

FIGURE 1. Treatments prescribed for rash diagnoses at the University Hospital of Northern BC emergency room between 1 January 2016 and 31 December 2018 (N = 463). Note: In some cases, more than one treatment was prescribed per patient.

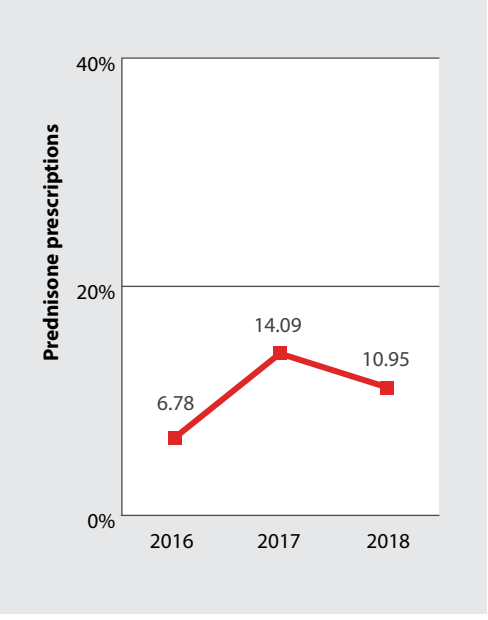

FIGURE 2. Rates of prednisone prescribing for rash diagnoses at the University Hospital of Northern BC emergency room between 1 January 2016 and 31 December 2018 (N = 48).

with nonspecific rash, of which 10.4% were prescribed prednisone. Of those patients who were prescribed prednisone, approximately 71% received nonspecific and/or uncertain diagnoses for rash; therefore, we suspect that prednisone was being used empirically to treat such cases in the ER. This may be related to the lack of a full-time dermatologist in this Northern BC community and a perceived lack of support for physicians to make specific diagnoses. It is also possible that patients' conditions required further investigation or monitoring, which was not feasible in the ER setting. Few patients who were prescribed prednisone, however, were documented as waiting for further assessment.

Few patients who were treated with prednisone received a follow-up referral to a dermatologist, even though a visiting dermatologist regularly works in the hospital's outpatient clinic. It is possible that the ER physicians were not fully aware that this service was available, or access may have been limited due to lengthy wait times. To address the need for dermatology services, the community has a part-time family physician dermatology clinic, but it also appears to be underutilized. Although most patients were referred to their family physician, this may be a result of reflexive documentation, and it is unclear to what degree this was communicated to the patient or family physician. A large portion of patients (~35%) were not given a follow-up referral to a health care provider following their ER visit and prednisone therapy. Based on the lack of specific diagnoses for rash cases and the risks associated with inappropriate prednisone use, it was important for the patients to follow up with their primary caregiver or specialist for further investigation and monitoring and to ensure patient safety and continuity of care.

Additionally, it is worth noting the prevalence with which sedating first-generation antihistamines such as diphenhydramine were prescribed to patients in the ER who presented with nonspecific rash. It is possible that, like prednisone, sedating antihistamines were being prescribed empirically. Second-generation antihistamines are preferred for the treatment of dermatologic conditions such as urticaria because of their superior tolerability, safety, and efficacy, as well as nonsedating properties.[9] It is possible that sedating antihistamines were prescribed out of habit due to their historical preference and to financial constraints of the hospital drug formulary and patient PharmaCare drug coverage given that other treatments may be associated with higher drug costs.

The main limitation of this study is that the chart review was retrospective and relied on documentation of diagnostic codes and treatment. Coding is not mandatory, and only 51.5% of UHNBC ER cases had diagnostic codes recorded at discharge.[10] Additionally, coding takes time and may not be completed accurately by ER physicians. Prednisone was likely also prescribed for nonspecific rash cases that were listed under other diagnostic codes such as those for eczema, psoriasis, or urticaria. The certainty/specificity of diagnoses is a subjective classification. Because only 2% of patients who were treated with prednisone were referred to dermatology, it is challenging to assess the accuracy and validity of the prescribing that was provided.

Few patients who were treated with prednisone received a follow-up referral to a dermatologist, even though a visiting dermatologist regularly works in the hospital's outpatient clinic.

This study suggests a need for further education in using current guidelines for treating dermatological conditions when considering the prescribing of prednisone. In addition, further education is needed on diagnosing common dermatologic presentations in the ER and on the importance of implementing follow-up for acute skin disorders after prednisone has been prescribed in the ER. Increased dermatology access and supports within underserviced areas of BC is also needed for local patients. Further studies on dermatology cases that present in ERs in Canada and BC are also needed given that the variable treatment of nonspecific rash is commonly recognized as a possible systemic issue. Also, prescribing trends identified in this study could be compared with those in other communities that have a dermatologist to determine if the prescribing of prednisone to treat nonspecific rash is related to a lack of dermatology services or is an ER-wide trend. Additionally, the ER physician rationale for using prednisone as an empiric treatment could be explored. ■

Competing interests

None declared.

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Use of disease dynamic modeling to inform the COVID-19 response in BC

British Columbia uses data and analytics to inform its response for tackling COVID-19. Mathematical modeling is one of the tools in our response. Mathematical modeling of infectious diseases allows us to study the spread of an epidemic and understand the potential impact of interventions. BC has been using mathematical modeling to illustrate what could happen to case counts under different conditions. Following are some examples of mathematical modeling of COVID-19 in BC.

Resuming in-class instruction in schools for the end of the school year

School benefits children in many ways, contributing to their overall mental health and providing opportunities for social connection and learning, and spaces for healthy eating and exercise. Therefore, reopening schools safely before the summer was a top priority.

Modeling illustrated that getting children back in school for the month of June would have little impact on the overall course of the epidemic in BC. These models incorporated local data on interactions between children and adults in BC, as well as emerging evidence that children are less likely to pass the infection on to other children or adults. Our modeling, in combination with data from around the world, supported the return of students to in-class learning in BC.

Monitoring the growth potential of the epidemic

To measure how a disease is spreading in a population, scientists track over time how many other people are likely to become infected from a single case. This is called the effective reproductive rate or R_t.

Before any measures were implemented in March, models showed that each person with COVID-19 was infecting nearly three other people. Through the spring, BC reduced that number down to well below one, the threshold of epidemic control. Measures included extensive testing leading to early diagnosis and isolation of cases, thorough contact tracing and quarantine, and measures to reduce crowding and contact with others. It was this reduction in R_t that flattened our curve.

As the pandemic progresses, R_t will continue to be monitored along with other indicators to assess COVID-19 transmission in the community [Figure].

Contact tracing to help ensure that transmission stays low

Contact tracing plays a key role in disease control by quickly identifying people who may have been exposed to the virus. These people are asked to stay home so they do not spread COVID-19 to others if they do become sick.

Modeling illustrates that as physical distancing measures relax and usual interactions resume, BC can help keep the reproductive rate below one through quick and complete contact tracing. This will help ensure that infected individuals do not pass COVID-19 on to others. British Columbians can support contact tracing by getting tested and staying home when they develop mild symptoms. Testing and self-isolation for those who feel sick will continue to be important for controlling COVID-19, particularly in schools and workplaces. ■

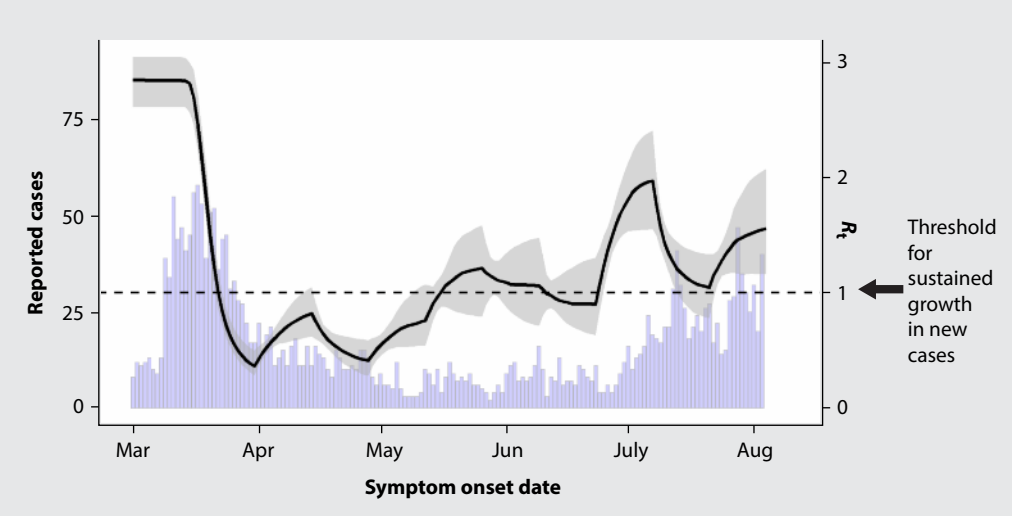

FIGURE. Model-estimated R_t for COVID-19 in BC, March to August 2020 (black line), shown with daily numbers of reported cases, excluding those attributed to facility outbreaks (purple bars).

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

Hanging up the keys: Planning for driving cessation and the shift to local transportation services

Most of us have been licensed to drive a motor vehicle all of our adult lives and we depend on this privilege, but when age-related health issues or disabilities arise, we may be required to give up our driving licence. For many older adults, the loss of a driver's licence has huge impacts on their social connectedness, their ability to participate in family and other events, and sometimes even their ability to continue working. For many, it will also impact their mental and physical health.

In BC, the number of people over age 65 continues to increase and is expected to reach over 1.6 million by 2041.[1] In a 2017 survey on seniors and driving, 55% of respondents indicated that they expect to continue driving after age 80.[2] For family, friends, and health care providers, this desire and expectation can have a significant impact when diminishing age-related physical and mental capabilities develop.

Currently, there are limited transportation alternatives for many older adults beyond relying on family members. While many communities can offer dependable transportation options, such as efficient and affordable public systems, many rural and semirural communities cannot. Many older adult drivers will accept their diminishing driving capabilities by altering their driving patterns and frequency; however, some will not. It can be a difficult discussion when a doctor is compelled to initiate a conversation with a patient about surrendering driving privileges for the sake of public safety. Many physicians will receive significant pushback, not only from patients, but often from family members who will be adversely affected by this change.

55% of respondents indicated that they expect to continue driving after age 80.

A better approach to keeping older adults moving and participating in community life is to focus on planning for age-related changes in transportation, adopting a transitioning strategy, and encouraging older adults to make pre-emptive use of active transportation, public transit, and other opportunities to ride as a passenger in a shared vehicle. People who ride as passengers in shared vehicles drive less frequently. They also begin to use public transportation and other alternatives, and may be better prepared when the time comes to hang up their car keys. Previous experience with such alternative modes of transport can make a difference.

Physicians can assist older adult patients with the transition to retiring from driving by being proactive. Before an age-related condition creates a critical driving risk, physicians can ask their patients, "How many more years do you intend to drive?" and "Have you given any thought to how you would get around if you weren't able to drive?" Asking these questions and sharing available transportation-related resources can help motivate older adults to start planning for driving cessation.

BC211 is an information and referral source that connects older adults with transportation resources. Public transit providers, like BC Transit and TransLink, provide conventional bus services in many communities. For those with disabilities, HandyDART offers door-to-door custom transit service with prescheduled pickup times. In places where public transit is unavailable or does not provide adequate service, older adults can often rely on community-based supports like the Better at Home program, funded in part by the United Way. Volunteer drivers in this program provide transportation to older adults for their medical appointments, family visits, grocery shopping, and other trips that are important for sustaining social connectedness and inclusion in the community.

A quick word for those pushing 70 years and hoping that driverless cars will solve this problem over the next decade: Don't hold your breath but do keep your fingers crossed! At the moment, all driverless models still require a driver to be able to intervene and take control of the vehicle if the car instructs them to do so. Research has demonstrated that age significantly impairs our ability to recognize, react, and regain control of a vehicle.[3] At such moments, the driver's physical and mental challenges (that prompted the need to switch to an automated driving option in the first place) are critically exposed. Completely automated cars are still likely some years off and will eventually be of great help when they arrive, but designers have not yet researched, planned, and received

This article is the opinion of the Emergency and Public Safety Committee, a subcommittee of Doctors of BC's Council on Health Promotion, and is not necessarily the opinion of Doctors of BC. This article has not been peer reviewed by the BCMJ *Editorial Board.*

enough input from older adult drivers and those with disabilities to fully develop and introduce them to the marketplace. In the meantime, planning for driving cessation is a critical step to ensuring the well-being and lifestyle of older adult drivers.[4] ■

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General Manager, Better Environmentally Sound Transportation BC

—Chris Rumball, MD

—Beverley Pitman, PhD
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BCCDC

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Help families team up against ANXIETY

Canadian Mental Health Association
British Columbia
Mental health for all

Confident Parents: Thriving Kids - Anxiety is a free program helping BC families overcome anxiety challenges in children ages 3–12.

This web- and phone-based coaching service helps parents and caregivers learn effective skills and strategies for managing anxiety. It's available by referral from physicians, clinicians and pediatricians.

Download referral forms at confidentparents.ca

Palliative care and legacy creation

A medical student's journey in understanding death.

Jillian Lin, BMLSc, MBiotech

Ms Lin is a third-year medical student at the University of British Columbia and has degrees in medical laboratory science and biotechnology. Her professional interests include preventive medicine, global health, and palliative care.

This article has been peer reviewed.

As the global COVID-19 death toll hits a new high every day, our hearts sink together with those of the families and friends of the deceased. For most of us, thinking about death is not a daily practice. It is in times like this that the thought of death could strike us as we watch the grief and pain behind each addition to the death toll. I remember receiving news about my aunt's cancer prognosis a few years ago and how shocked I was, for the first time, at the thought of someone close to me dying. Death is such a taboo topic and it is feared in many cultures. In my culture, talking about death is considered ominous and it is avoided whenever possible. No one in my family talked about what dying entails, even when one of our own was reaching the end of life. Eager to understand death, I started my own journey of exploration by participating in palliative care and legacy creation.

I was nervous when I started volunteering at the palliative care unit in a hospital. What if the people there cry? What if I can't control my emotions? What if someone dies in front of me? The list of what-ifs was endless. Nevertheless, I walked into the unit and started talking to

patients and their families. After a while, I was surprised to discover that I actually felt at peace. It was calming on the ward, almost as if I had unloaded the burden I carried. But I couldn't name what it was about the ward, the patients, and their families that calmed me down.

During my time there I befriended many patients and their families. Some patients passed away before I got to know them, and some I got to know very well. It was never easy to learn about a patient's death, but as time went on, I found myself feeling relieved when I knew that a patient spent their last moments with dignity, great care, and no pain. I learned how a holistic approach to care near the end of life could benefit patients and families and noticed a shift in my perception of death. It was no longer a scary and unknown concept but rather a normal part of life. The volunteering experience sparked my interest in the field. During medical school I was fortunate to have the opportunity to work on a palliative care project, the Legacy Project, through UBC. This project involved pairing a medical student with a patient at the end of their life to create an item of the patient's discretion that would be left behind for their loved ones.

I first met Ms Betty Bains* through her counselor, who introduced her to the program. "I was diagnosed with an incurable disease and I just don't know how much time I have," she told me. Betty has many children and grandchildren, and they are the reason for her participation in the Legacy Project. She loved the idea of leaving something meaningful behind for them. While talking to Betty and getting to know her more, I felt fortunate to be able to participate in the creation of her legacy. I was about to enter a vulnerable space to learn about her life, values, hardships, and wishes for her loved ones. It was a privilege to have such an opportunity.

We decided to create a video and use questions from the RecordMeNow app (www.recordmenow.org) to guide us. RecordMeNow is a free application that allows people to create a lasting video legacy and has approximately 40 questions to help create a legacy. The creator of the RecordMeNow app, Gaby Eirew, surveyed 100 people who were younger than 16 years of age when their parents died to find out what questions they wish their parents could have answered for them. The app was built around these questions. We thought it was a good place to start as Betty's main audience to her legacy would be her children and grandchildren.

We worked together on the recording over a couple of weeks. I learned about where Betty grew up, her childhood stories, the most romantic date with her spouse, and some of their favorite family recipes. Then, I watched her talk about her diagnosis, her struggles, and how she coped with them. As we got to the final phase of recording, the questions became more difficult to answer. "What's your advice for your children about living after you die?" I asked after returning to meet with her for our last recording session.

"I feel like I have no regrets and I can just go anytime now. I have said everything I wanted in there," Betty said to me after we finished watching the video.

"Be strong," she said. "Lean on each other for support . . . and try to be happy when finally the pain of it goes away." I could see that Betty was trying hard to hold back her tears and started getting choked up. I passed some tissues to her while she said to me, "Just as a parent, I just wish that they never, never, never, ever have to go through anything like that . . . but unfortunately, it's part of it . . . I hope doing this helps."

After we finished recording, I edited the plethora of content we generated to create a video full of Betty's stories, thoughts, values, and wisdom. We then watched the final product together. "I feel like I have no regrets and I can just go anytime now. I have said everything I wanted in there," Betty said to me after we finished watching the video. It was one of the most satisfying and meaningful moments I have ever experienced.

My aunt lost her battle to cancer in February of this year, right when the world was starting to see an increasing number of fatalities due to COVID-19. I wonder if it would have been easier for her, or if it would at least have relieved some of the pain that my family had to go through, if she had created a legacy item like Betty's. I wonder how my aunt would have reminisced about her life while going through this process and if it would have brought her more peace at the end of life. Similarly, for those who unexpectedly lost their lives due to COVID-19, I wonder how many of them had opportunities to say goodbye to their loved ones and to say what they needed to say to leave the world with no regrets.

Finally, I started to understand the peace I felt on the palliative care unit when I volunteered there. It came from the collective awareness of our final destination—death. No matter who we are, where we are from, or what titles we hold, we can rest assured that our final stop will be the same. Death is inevitable and unpredictable. No one can hold onto the gift of life forever, and no one knows when death will knock on their door. Who could have known that a viral illness would change how our world operates and take away over 800 000 lives globally (as of August 2020) in merely a few months?

Shanzhong is a concept in Chinese culture that praises an ideal death. It is about coming to wholeness, and it is what people wish for their loved ones at the end of life. We often talk about living a good life, but how do we die a good death? While the idea of a good death may be different to different people, some commonalities exist regardless of someone's cultural background. Love, acceptance, peace, dignity, and comfort are just some of the things that both the living and the dying strive for. Perhaps living a good life and dying a good death are really two sides of the same coin. Dying a good death starts while we are still alive. ■

**The patient's name and identifying details have been changed for confidentiality.*

News

We welcome news items of less than 300 words; we may edit them for clarity and length. News items should be emailed to journal@doctorsofbc.ca and must include your mailing address, telephone number, and email address. All writers should disclose any competing interests.

Dr Glenn Regehr awarded the Karolinska Institutet Prize for Research in Medical Education

Glenn Regehr, PhD, has been awarded the 2020 Karolinska Institutet Prize for Research in Medical Education. Dr Regehr is a senior scientist, founding associate director of research at the Centre for Health Education Scholarship, and professor (Department of Surgery) in the UBC Faculty of Medicine. His work has improved the educational and scholarly practices in health professions education. His research looks broadly at the experiences of learners and teachers in the health professions. Dr Regehr will receive the award and a prize amount of €75 000.

The purpose of the prize is to recognize and stimulate high-quality research in the field and to promote long-term improvements of educational practices in medical training.

Dr Regehr's main research impact has been in conceptualizing methodology and its relationship to theory, a groundwork for significant research activity. He has also introduced a variety of methodological innovations, drawing heavily on work done outside the health professions.

The Karolinska Institutet Prize for Research in Medical Education is financed by the Gunnar Höglund and Anna-Stina Malmborg Foundation.

COVID-19: Evidence for predicting how severe a patient's illness will become and why patients develop blood clots

A team from Lawson Health Research Institute and Western University has made significant steps in understanding COVID-19 through two back-to-back studies published in *Critical Care Explorations*. In one study, the team identified six molecules that can be used as biomarkers to predict how severely ill a patient will become. In the other study, they revealed for the first time a new mechanism causing blood clots in COVID-19 patients and potential ways to treat them.

The studies were conducted by analyzing blood samples from critically ill patients at London Health Sciences Centre (LHSC). They build on a growing body of work from the team that was first to profile the body's immune response to the virus by revealing six molecules that could act as potential targets to treat hyperinflammation in critically ill patients.

Dr Douglas Fraser, lead researcher from Lawson and Western's Schulich School of Medicine & Dentistry, and a critical care physician at LHSC, clarifies that the findings need to be validated with larger groups of patients, but they could have important implications for treating and studying this disease.

Predicting which COVID-19 patients will get worse

When patients are admitted to ICU, care providers wait to see if they are going to get worse before considering risky interventions. Dr Fraser explains that to improve outcomes they need new therapies but also a way to predict which patients are going to get worse.

The researchers identified six molecules of importance (CLM-1, IL12RB1, CD83, FAM3B, IGFR1R, and OPTC). They found that these molecules were elevated in COVID-19 patients who would become even more severely ill, and when measured on a COVID-19 patient's first day of ICU admission, the molecules could be used to predict which patients will survive following standard ICU treatment.

The team measured 1161 plasma proteins from the blood of 30 participants: 10 COVID-19 patients, 10 patients with other infections admitted to LHSC's ICU, and 10 healthy control participants. Blood was drawn on set days of ICU admission, processed in a lab, and then analyzed using statistical methods and artificial intelligence.

The team notes that predicting a patient's disease severity can help by allowing medical teams to have important conversations with family members, and setting goals of care based on the patient's health and personal wishes. Medical teams could use the knowledge to mobilize resources more quickly. If they know a patient is at higher risk of death, they may consider intervening sooner despite associated risks. The team also hopes the findings can be used to better design COVID-19 clinical trials by grouping patients based on their risk. This could allow for stronger results when examining potential treatments for the disease.

Understanding why blood clots occur and how to treat them

A major complication occurring in most critically ill COVID-19 patients is clotting in the small blood vessels of the lungs, which leads to low oxygen levels in the body. The reason for this clotting has been unclear. The team further analyzed the blood samples from their 30 participants and found evidence to suggest that the inner linings of small blood vessels become damaged and inflamed, making them a welcoming environment for platelets to stick.

They discovered that COVID-19 patients had elevated levels of three molecules (hyaluronic acid, syndecan-1, and P-selectin.) The first two molecules are products broken down from the glycocalyx that lines the inside of the blood vessels. Their presence suggests the glycocalyx is being damaged with its breakdown products sent into the bloodstream. The presence of P-selectin is also significant as this molecule helps to make platelets and the inner lining of blood vessels adhere to one another. The team suggests that two therapies may hold promise for treating blood clots in COVID-19 patients: platelet inhibitors to stop platelets from sticking and molecules to protect and restore the inner lining of blood vessels.

The two articles are "Novel outcome biomarkers identified with targeted proteomic analyses of plasma from critically ill coronavirus disease 2019 patients" (doi: 10.1097/CCE.0000000000000189) and "Endothelial injury and glycocalyx degradation in critically ill coronavirus disease 2019 patients: Implications for microvascular platelet aggregation" (doi: 10.1097/CCE.0000000000000194).

COVID-19 office safety plan support grant for BC's community physicians

Doctors with community offices in BC have invested time and expense to re-open their practices in a way that ensures safe in-person care. To help offset some of the associated costs, the Joint Collaborative Committees are reallocating funds to provide a $1000 grant to each eligible physician who has implemented a COVID-19 safety plan in their community practice. Eligible physicians are those who:

- Have an active practice in a community office that provides publicly funded health services.
- Are paid under Fee For Service, Alternate Payment Plan, or Population-Based Funding arrangements (GP funding). APP physicians who are compensated on an hourly-based contract and have been able to claim their time developing a safety plan as part of their contract are not eligible.
- Have directly incurred eligible costs related to the development and implementation of a COVID-19 safety plan in a community office.

For information about eligibility criteria and to apply, go to www.doctorsofbc.ca/news/covid-19-office-safety-plan-support-grant.

One in three people avoiding health care workers during pandemic

UBC research reveals fears that have arisen among the general public about coming into contact with health care workers during the COVID-19 pandemic. One in four people surveyed went so far as to agree that the freedoms of health care workers should be restricted. The study is believed to be the first on stigmatization of health care workers during the COVID-19 pandemic. Steven Taylor, PhD, a professor of psychiatry in UBC's Faculty of Medicine, is lead author of the study, published by the *Journal of Anxiety Disorders*.

The research team surveyed a random sample of 3551 people in Canada and the US between 6 and 19 May to see if they would discriminate against health care workers based on fears they could carry the virus that causes COVID-19. One in three respondents agreed

or strongly agreed with the statement "I do not want to be around someone who works in a health care setting."

The researchers also asked respondents how often they participated in nightly shows of support for health care workers. Clapping, cheering, and banging pots didn't make a person any less likely to stigmatize health care workers.

Previous research has shown that COVID-19 is only slightly more prevalent among health care workers than it is among the general population: 0.14% compared to 0.10%. Experts believe much of this difference can be attributed to more testing among health care workers.

Data from this study showed that stigmatization was closely related to COVID-19 Stress Syndrome, which had been identified by Taylor in earlier research and is characterized by:

- Fears that COVID-19 is highly dangerous.
- A tendency to view foreigners as sources of infection.
- Avoidance of public places like supermarkets where encounters with other people are likely.

While the COVID-19 pandemic does carry risks for health care workers, the risk of contracting the virus is not high among them. Workplace stress is a much bigger problem, and stigmatization compounds that mental health risk. The researchers call for clear, sensible public education campaigns to help people understand that health care workers pose little risk to the public. The article, "Fear and avoidance of healthcare workers: An important, under-recognized form of stigmatization during the COVID-19 pandemic," is available at https://doi.org/10.1016/j.janxdis.2020.102289.

Comprehensive supports for children with medical complexity

Children across BC with extraordinary health needs, requiring complex care, will soon have access to a children's complex care transition centre in Vancouver. Operated by the BC Children's Hospital, the facility will fill gaps in services and supports for children and young people with complex care needs and will complement what is currently provided in acute care and community settings. This will be the first centre in the country to provide such a comprehensive range of supports for children with medical complexity at a single site. The centre will serve as a stepping stone between acute hospital care, community care, and home, providing services under a new, unique model of care designed to support patients and families in the transition.

The centre will support children in improving their quality of life through education and building local care capacity for those who are moving back home from an acute care setting but who may not be ready for a full return, as well as helping to avoid crisis situations requiring admission to an acute care facility.

Patients up to 19 years of age and their families will be able to access health care services ranging from assessment, examination, and treatment to education, training, and research. Care will be provided by an interdisciplinary team of doctors, nurse practitioners, nurses, and allied health professionals. The centre will also provide training for parents and caregivers to help with care delivery at home, as well as supports for siblings. The virtual campus and province-wide community-based care network will extend the centre's reach to every area of BC and will also include training and support for caregivers and clinicians.

The new facility will be located at the current site of the Sunny Hill Health Centre for Children, scheduled to be relocated to the main campus of the BC Children's and Women's Hospitals. There will be close links between the services provided at the site and those provided on the main BC Children's Hospital campus on Oak Street.

Virtual supports for health care providers in rural, remote, and Indigenous communities

Real-Time Virtual Support (RTVS) pathways is a new virtual support initiative enabling rural health care providers to deliver timely patient-centred care closer to home. Physicians, nurse practitioners, and nurses in rural, remote, and Indigenous communities will have access to 24-hour, just-in-time advice through Zoom and can be connected to one of five teams providing culturally safe and compassionate support:

- RUDi—Emergency
- ROSe—Critical care
- CHARLiE—Pediatrics
- MaBAL—Maternity and newborn
- UBC Dermatology rural and remote service

These teams have an understanding of the rural and cultural contexts and are available to support rural health care providers for any issue, including:

- Providing a patient consult, second opinion, or ongoing patient support.
- Reviewing a patient case.
- Running through patient simulation scenarios.
- Navigating the health care system.
- Providing collaborative support in critical times.

To learn more about the pathways and how to access them, download the RTVS Toolkit for Healthcare Providers at http://bit.ly/RTVSToolkit. The toolkit includes access information, Zoom instructions, FAQs, bios and photos of RTVS teams, and posters.

Real-Time Virtual Support is an initiative of the Virtual Health and Wellness Collaborative for Rural and First Nations BC. For more information visit https://rccbc.ca/rtvs.

Obituaries

We welcome original tributes of less than 300 words; we may edit them for clarity and length. Obituaries may be emailed to journal@doctorsofbc.ca. Include birth and death dates, full name and name deceased was best known by, key hospital and professional affiliations, relevant biographical data, and a high-resolution head-and-shoulders photo.

Dr George Duncan McPherson

1932–2020

Duncan was easy to like, occasionally difficult to fathom, and annoyingly intelligent with numerous interests both within and outside his profession. We met as junior surgical residents at Vancouver General Hospital and became friends for life.

Duncan passed away peacefully in Vancouver at dawn on 15 August 2020. He is survived by his immediate family: wife, Carol; and daughter, Alexandria; daughter, Margret (Bob); sons, Ian (Louise) and Hugh (Clariel); and four grandchildren, Maren, Jocelyn, and two newborn twins, Stellan and Lachlan. He is predeceased by his daughter, Cathy, and survived by his former wife, Catherine.

Born in Brant County, Ontario, Duncan was raised in a farming family with his sister, Helen, and brother, Gordon, both of whom predeceased him. He graduated from the medical program at the University of Western Ontario. To assist with his university fees, he drove a large tour bus in Banff, Alberta, during the summers. There he fell in love with the Rocky Mountains. He interned in Chicago after graduation before entering the orthopaedic program in Vancouver.

During his orthopaedic training he spent a year doing research with Dr Douglas Harold Copp at UBC, which in 1962 led to the identification and purification of a hormone that contributes to maintaining calcium and phosphate levels. Dr Copp named it calcitonin. For this work he received a master of science degree from UBC. After acquiring his Royal College Fellowship, Duncan's research interests took him and his wife, Catherine, to New York as a fellow in orthopaedics at the Hospital for Special Surgery. This led to a position as medical research fellow at Lund University in Malmo, Sweden. He defended his thesis in Swedish and earned a PhD. In 2015, he was invited back and was honored as a *doctor jubilaris* at Lund. While in Sweden he made many friends and years later had the pleasure of sailing with some of them in the Mediterranean.

Duncan returned to Vancouver as a member of the orthopaedic staff at Shaughnessy Hospital and VGH. When I returned from postgrad training in the UK, I joined Bob Cowan as a plastic surgeon at VGH and opened an office with a young general surgeon just starting practice. When the young surgeon moved to a full-time UBC position, Duncan came to share our space. This pleasant arrangement lasted until I retired from practice 30 years later.

Duncan was always looking for ways to improve things. Some of you in my age group will remember when ambulances were modified Cadillacs, good only for transportation.

Realizing that care prior to arrival and during transport to emergency is often of vital importance, Duncan decided to do something about it. He convinced an RV fitter to modify a large van to give first responders the space and equipment to treat patients during transportation. This became the prototype for today's modern ambulance. He had a strong belief in the benefits of seatbelts in cars and played a major role in convincing government to enact seatbelt legislation in BC. Because of these efforts, he was made an Office Brother of St. John Ambulance and received the Centennial Medal. In his spare time he found a year to serve as president of the then BCMA.

Duncan had three passions: cars, sailing, and traveling. He got me interested in collector car restorations, and it was not long after he built his first sailboat that I ordered mine. As time went on he became more interested in accident reconstruction and automotive medicine, which led to forensic orthopaedics. Because of his knowledge in this field a number of car companies retained him on a regular basis as an expert witness, which resulted in a lot of traveling. He was a long-standing and loyal member of the Association for the Advancement of Automotive Medicine and served on its board of directors.

Duncan and I had families of four children of similar ages. We both enjoyed our toys and it gave us great pleasure that our children enjoyed them equally. We were able to explore the West Coast and wonder at the beauty of our province. Occasionally we caught a fish. I will always remember the times we would anchor in False Bay on Lasqueti Island close to *Black Chanter*, Duncan's boat, when the banana boat would come in with a catch of fresh prawns. We would all gather in *Black Chanter*'s cockpit to enjoy the prawns prepared by Cathy along with a glass of chilled white wine. *Black Chanter* was eventually replaced with something bigger and faster, and Duncan took on another pleasure, sailboat racing.

Because of his love for the mountains and exploring, Duncan found a place in the woods not too far from Twin Peaks, north of Kamloops. Here Duncan and Carol entertained family and friends with good food and wine and great scenery. Here he found time to restore two vintage family farm tractors with a lakeshore neighbor.

Duncan lived a life full of purpose and accomplishment. He was a very caring person

who never hesitated to assist when needed. I feel fortunate to have had him as a friend.

—Douglas Courtemanche, MD, FRCSC
Vancouver

Dr Michael Entwisle
1927–2020

Dr Michael Entwisle was born in French Guinea on 31 October 1927 and died on 31 July 2020 in Courtenay, BC, on the hobby farm he dubbed Guineacres.

At age 5, Michael returned to England with his parents where he was educated and completed his military service as an officer in the Royal Artillery. He went on to study medicine at St. Mary's Hospital Medical School in London, which led to a variety of positions as a doctor, before he trained to become a psychiatrist. He married Rosemary Moore in 1955 and they raised four children, immigrating as a family to Calgary in 1969 where Michael joined the new Foothills Hospital and the new medical school at the University of Calgary. He was appointed to the Department of Psychiatry in the Faculty of Medicine in 1971, a relationship which continued until 1991 when he was appointed professor emeritus of psychiatry. During those years he was director of the Residency Training Program in Psychiatry; Adolescent Treatment Programs, including Wood's Christian Homes; and the medical staff of Alberta Mental Health Services, Calgary Region. He also served on the Admissions Committee of the medical school and as associate director in the Department of Psychiatry at Calgary General Hospital.

After the dissolution of his first marriage, in 1988 Michael met Susan Ketchen who lured him to Vancouver Island where for 6 years he was director of psychiatry at St. Joseph's General Hospital in Comox and consultant psychiatrist to BC Mental Health Services in the Comox Valley and north Vancouver Island, linking with UBC as an honorary clinical professor of psychiatry.

He retired in 1997 and developed the skills needed for country life. He happily learned to use a chainsaw, herd chickens, and drive a tractor, and he enjoyed his ride-on lawnmower until the last month of his life. He took special pleasure in sharing his rural paradise with his children, grandchildren, and colleagues. He had an easy laugh, and behind his gentle exterior was a remarkable determined spirit. He died on his terms, in his own bed with a view out over the pasture to the mountains.

Michael is survived by his wife, Susan Ketchen; children, Alison, Christine (Lance), and Stephen; and grandchildren, Kaela (Andrew), and Alexandra (Matt). He was predeceased by his son, Jonathan.

If desired, donations may be made to a favorite charity or the Red Cross.

—Susan Ketchen
Courtenay, BC

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 "Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals" by the International Committee of Medical Journal Editors (updated December 2016), and encourages authors to review the complete text of that document at www.icmje.org.

All materials must be submitted electronically, preferably in Word, to:

The Editor
BC Medical Journal
E-mail: journal@doctorsofbc.ca
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 email 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 website.

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, email address, and phone number.
- ☐ Number all pages consecutively.

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.

Letters. All letters must be signed, and may be edited for brevity. Letters not addressed to the Editor of the *BCMJ* (that is, letters 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

Obituaries. 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.

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/ survey studies

Manuscripts of scientific/clinical articles and case reports should be 2000 to 4000 words in length, including tables and references. 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 email address of corresponding author.

Survey studies must have a response rate of at least 50% in order for the paper to be reviewed for publication consideration. Papers with less than this response rate will not be reviewed by the *BCMJ* Editorial Board. We recognize that it is not always possible to achieve this rate, so you may ask the Editor in advance to waive this rule, and if the circumstances warrant it, the Editor may agree to have the paper reviewed.

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.

2. **Copyright.** All authors must sign and return an "Assignment of copyright" prior to publication. Published manuscripts become the property of Doctors of BC and may not be published elsewhere without permission.
3. **Disclosure.** All authors must sign a "Disclosure of financial interests" statement and provide it to the *BCMJ*. This may be used for a note to accompany the text.
4. **Consent.** If the article is a case report or if an individual patient is described, written consent from the patient (or his or her legal guardian or substitute decision maker) is required.

Papers will not be reviewed without this document, which is available at www.bcmj.org.

References to published material

Try to keep references to fewer than 30. Authors are responsible for reference accuracy. References must be numbered consecutively in the order in which they appear in the text. Avoid using auto-numbering as this can cause problems during production.

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: List up to four authors or editors; for five and more, list first three and use 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).

Material submitted for publication but not accepted should not be included.

Permissions

It is the author's responsibility to obtain written permission from both author and publisher for material, including figures and tables, taken or adapted from other sources. Permissions should accompany the article when submitted.

Scientific misconduct

Should possible scientific misconduct or dishonesty in research submitted for review by the *BCMJ* be suspected or alleged, we reserve the right to forward any submitted manuscript to the sponsoring or funding institution or other appropriate authority for investigation. We recognize our responsibility to ensure that the question is appropriately pursued, but do not undertake the actual investigation or make determinations of misconduct.

Tables and figures

Tables and figures should supplement the text, not duplicate it. Keep length and number of tables and figures to a minimum. Include a descriptive title and units of measure for each table and figure. Obtain permission and acknowledge the source fully if you use data or figures from another published or unpublished source.

Tables. Please adhere to the following guidelines:

- ☐ Submit tables electronically as Word or Excel files so that they may be formatted for style.
- ☐ Number tables consecutively in the order of their first citation in the text and supply a brief title for each.
- ☐ Place explanatory matter in footnotes, not in the heading.
- ☐ Explain all nonstandard abbreviations in footnotes.
- ☐ Ensure each table is cited in the text.

Figures (illustrations). Please adhere to the following guidelines:

- ☐ Images must be high resolution; if unsure, send highest resolution possible and we will advise if necessary.
- ☐ Number figures consecutively in the order of their first citation in the text and supply a brief title for each.
- ☐ Place titles and explanations in legends, not in or on the illustrations themselves.
- ☐ Provide internal scale markers for photomicrographs.
- ☐ Ensure each figure is cited in the text.
- ☐ Color is not normally available, but if it is necessary, an exception may be considered.

Units

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).

Abbreviations

Except for units of measure, we discourage abbreviations. However, if a small number are necessary, use standard abbreviations only, preceded by the full name at first mention, e.g., in vitro fertilization (IVF). Avoid abbreviations in the title and abstract.

Drug names

Use generic drug names. Use lowercase for generic names, uppercase for brand names, e.g., venlafaxine hydrochloride (Effexor). Drugs not yet available in Canada should be so noted.

Reprints

Reprint order forms will be sent to authors upon publication of the article. If you know that you would like additional copies prior to printing, please advise us and we can arrange a larger print run.

Manuscript submission checklist

Before you submit your paper, please ensure you have completed the following, or your paper could be returned:

- ☐ Authorship, copyright, disclosure, and consent form is completed and included (available at www.bcmj.org).
- ☐ Abstract is provided.
- ☐ Three key words are provided.
- ☐ Author information is provided for all authors.
- ☐ References in text are in correct numerical order.
- ☐ Reference list is in correct numerical order and is complete.
- ☐ References list contains up to three authors only.
- ☐ All figures and tables are supplied.
- ☐ Permissions letters are included.

CME calendar

Rates: $75 for up to 1000 characters (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. **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; e.g., 1 February for the March issue. The *BCMJ* is distributed by second-class mail in the second week of each month except January and August. **Planning your CME listing:** Advertising your CME event several months in advance can help improve attendance; we suggest that your ad be posted 2 to 4 months prior to the event. **Ordering:** Place your ad at www.bcmj.org/cme-advertising. You will be invoiced upon publication. Payment is accepted by Visa or MasterCard on our secure online payment site.

PSYCHOLOGICAL PPE PEER SUPPORT BEYOND COVID-19

Online (Wednesdays)

In response to physician feedback, the Physician Health Program's online drop-in peer support sessions, established 7 April, are now permanently scheduled for Wednesdays at noon. The weekly sessions are co-facilitated by psychiatrist Dr Jennifer Russel and manager of clinical services Roxanne Joyce and are drop-in with no commitment required. The focus is peer support, not psychiatric care. All participants have the option to join anonymously. To learn more about the sessions and the program, visit www.bcmj.org/news-covid-19/psychological-ppe-peer-support-beyond-covid-19. Email peersupport@physicianhealth.com for the link to join by phone or video.

CME ON THE RUN

Online, 2 October 2020–4 June 2021 (Fridays)

The CME on the Run sessions are offered online. Registrants will receive links to go online before each session. Each program runs on Friday afternoons from 1–5 p.m. and includes great speakers and learning materials. Topics and dates: 20 November 2020 (Diagnostics/Radiology). Topics include: "Investigating COVID-19, what is the real deal?," "Is my heart broken doc?," "Medical imaging for the heart," "Navigating NASH diagnostic tools," "Point-of-care ultrasound—practical applications for in-office use," "Detecting the smoker's time bomb with low-dose CT," "ABCDs of dense breasts," "Health technologies that help our patient help us," and "Back troubles—is imaging for lumbar pain syndromes useful?" The next sessions are: 29 January (Therapeutics), 5 March (Ophthalmology/ENT), 7 May (Geriatrics), and 4 June (Internal Medicine). To register and for more information visit https://ubccpd.ca/course/cme-on-the-run-2020-2021 or email cpd.info@ubc.ca.

THE 32nd ANNUAL DIABETES DIRECTORS SEMINAR

Vancouver, 23 October 2020

The Endocrine Research Society is pleased to present the 32nd Diabetes Directors Seminar—an annual, UBC-accredited gathering of leading diabetes experts and caregivers across British Columbia. Join us virtually or at the Robert H. Lee Alumni Centre on UBC campus (TBD) for a full-day presentation series covering the latest and most pertinent aspects of diabetes therapeutics and clinical care. Target audience is specialists and family physicians with an interest in diabetes care, as well as nurses, dietitians, pharmacists, and other diabetes educators responsible for diabetes management within their own groups and communities. Register now as space is limited. Online registration can be found at www.endocrineresearchsociety.com/events/32nd-annual-diabetes-directors-seminar-2. Contact Ashini Dissanayake at the Endocrine Research Society for more information or registration questions. Email ashinid.ers@gmail.com, phone 604 689-1055.

SKIN CANCER: INTERACTIVE SCENARIOS AND PRACTICAL APPROACHES FOR PRIMARY CARE

Virtual Conference, 13 November 2020, 1–4 p.m.

Plan to join us for an afternoon of case-based oncology learning focusing on prevention, diagnosis, and management of both common skin cancers and melanoma. Led by outstanding dermatologist and surgical oncologist speakers, this next-level learning opportunity is presented by BC Cancer's Family Practice Oncology Network. Register today at fpon.ca. Cost: $50. For more information email dilraj.mahil@bccancer.bc.ca.

GP IN ONCOLOGY EDUCATION

1–12 Feb and 13–24 Sept 2021 (Mon–Fri)

BC Cancer's Family Practice Oncology Network offers an 8-week General Practitioner in Oncology education program beginning with a 2-week introductory session every spring and fall at BC Cancer–Vancouver. This program provides an opportunity for rural family physicians, with the support of their community, to strengthen their oncology skills so that they can provide enhanced care for local cancer patients and their families. Following the introductory session, participants complete a further 30 days of clinic experience at the cancer centre where their patients are referred. These are 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.

Classifieds

Advertisements are limited to 700 characters. Rates: Doctors of BC members: $50 + GST per month for each insertion of up to 350 characters. $75 + GST for insertions of 351 to 700 characters. Nonmembers: $60 + GST per month for each insertion of up to 350 characters. $90 + GST for insertions of 351 to 700 characters. **Deadlines:** Ads must be submitted or canceled by the first of the month preceding the month of publication, e.g., by 1 November for December publication. Visit www.bcmj.org/classified-advertising for more information. **Ordering:** Place your classified ad online at www.bcmj.org/classified-advertising. Payment is required at the time that you place the ad.

PRACTICES AVAILABLE

KELOWNA—GP REQUIRED

Small solo practice in newer building with a mountain view from the many large windows. Looking for family doctor to replace one retiring after 40 years. Low overhead, no files, Med Access EMR, and very nice MOA and patients. For more info email lianne.lacroix@shaw.ca.

VERNON—GREAT PRACTICE OPPORTUNITY

Well-established practice with excellent reputation available in the beautiful Okanagan. Located in downtown Vernon. Wonderful patient base and hard-working staff. Excellent remuneration for one to two practitioners. Privileges at Vernon Jubilee Hospital available/optional. Golf, wineries, lakes, and skiing at your doorstep. Contact Fred Dyck at freddyck91@icloud.com.

VICTORIA—FP/WALK-IN

Well-established fee-for-service walk-in practice in the centre of James Bay, Victoria. Varied demographics and many long-term patients as we have been part of this community for 30 years. Looking to transfer ownership before retirement in December 2020, able to stay on longer for smooth transition. Office uses OSCAR EMR, has two exam rooms, and is equipped for minor procedures. Contact Dr Michael Greenwood at 250 388-9934 or email jbcentre@telus.net.

VICTORIA—VANCOUVER ISLAND PHLEBOLOGY/VEIN CARE PRACTICE

Very successful well-established practice, large referral network and wait list, great add to cosmetic practice or stand-alone. Email mediquest@telus.net for more information.

EMPLOYMENT

BURNABY—FT OR PT FP OPPORTUNITY

An opportunity exists for a part-time or full-time family physician to join a turnkey practice/walk-in clinic in Burnaby. The group consists of three other family physicians in a shared office environment on OSCAR EMR, located on the 2nd floor of a busy business plaza. Parking is free, please inquire with clinic coordinator Richard at rw@bcdrug.com.

CANADA—ARE YOU A PHYSICIAN LOOKING FOR A NEW ROLE?

Locum, long-term, city, or rural—we have it all. Whether you are a physician looking for work across Canada, or a medical facility requiring physicians, the team at Physicians for You can help. Your time is valuable. Let our 10 years of experience in Canada, extensive knowledge of the processes for licensure, and personalized, friendly service work for you. Our strong reputation is built on exceptional service and results. Check out our current job postings on our website and call the trusted recruitment team today. Visit us online at www.physiciansforyou.com, email info@physiciansforyou.com, or call 1 778 475-7995.

KOOTENAY BOUNDARY (NAKUSP)—OPPORTUNITIES IN BC SOUTHERN INTERIOR

Be part of a well-established fee-for-service practice with emergency opportunities in Nakusp, located in the Kootenay Boundary region in BC. The office is modern with an excellent, friendly staff, including a social worker, a diabetic nurse, and a physiotherapist. Our community 24/7 ED just got a

$2 million upgrade, and public health services are available locally. Nakusp has exceptional year-round recreation and a great work/life balance. The opportunities are endless here and there are no traffic lights for 100 km! Please inquire to join a rural practice at https://physicianjobs.interiorhealth.ca/ or contact me directly at charlene.pawluk@interiorhealth.ca.

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 two 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 Lisa Wall at 250 390-5228 or email lisa.wall@caledonianclinic.ca. Visit our website at www.caledonianclinic.ca.

NANAIMO—PSYCHIATRIST, ADDICTIONS AND MENTAL HEALTH
With 100 years of collective experience in addiction medicine, EHN—Canada's dedicated treatment team—takes the time to understand each client personally. We are seeking an addictions psychiatrist for a minimum 4 days per week. Duties include evaluation and treatment in a residential addiction setting, particularly with clients presenting with mood and anxiety disorders, PTSD, personality disorders, and substance use disorders. Knowledge and experience with the psychological and physical symptoms associated with withdrawal and trauma required. Competitive salary options available. Contact human resources at staffing@edgewood.ca.

NORTH VAN—FP LOCUM
Busy, established physicians with stellar support staff seek part-time or full-time associates. Doctors currently needed to fill very busy telemedicine and in-office shifts. Oscar EMR with technical support. Part-time associates will be on a 70/30 split for weekend and evening shifts. Option of working from home. For further information, contact Kim at 604 987-0918 or kimgraffi@hotmail.com.

PORT COQUITLAM—FULL-TIME FP, WALK-IN CLINIC SHIFTS
An opportunity exists for two family physicians/GPs to join a two-physician, managed-overhead, turnkey, newly renovated medical clinic in the bustling Fremont Village area of Port Coquitlam. Join our team of seven physicians on PLEXIA/OSCAR EMR. Experienced staff, competitive overhead, telemedicine integration, and prime location. Contact Richard rw@bcdrug.com.

POWELL RIVER—LOCUM
The Medical Clinic Associates is looking for short- and long-term locums. The medical community offers excellent specialist backup and has a well-equipped 33-bed hospital. This beautiful community offers outstanding outdoor recreation. For more information contact Laurie Fuller: 604 485-3927, email: clinic@tmca-pr.ca, website: https://powellrivermedicalclinic.ca.

SOUTH SURREY/WHITE ROCK—FP
Busy family/walk-in practice in South Surrey requires GP to build family practice. The community is growing rapidly and there is great need for family physicians. Close to beaches and recreational areas of Metro Vancouver. OSCAR EMR, nurses/MOAs on all shifts. CDM support available. Competitive split. Please contact Carol at Peninsulamedical@live.com or 604 916-2050.

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.

VANCOUVER—TELEHEALTH OR CLINIC SHIFTS URGENTLY NEEDED
Telehealth MDs and/or clinic physicians wanted for a busy Vancouver family practice/walk-in clinic. Our clinic uses an exceptional web-based EMR (Plexia), which is simple to use and fully functional for all telehealth services (such as a secure video chat quick link built right into the EMR patient profiles). The EMR allows doctors working from home to write, sign electronically, and electronically send prescriptions to a pharmacy instantly; write referral letters, view past chart notes, imaging, lab results, order lab tests, order imaging, and instant message the MOAs. Shifts flexible: 9 am to 9 pm Monday to Thursday, 9 am to 6 pm Friday, and 10 am to 4 pm on weekends. Email manager@aquariusmedical.ca or call 604 669-7772-0 (manager).

VICTORIA—GP/WALK-IN
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.

MEDICAL OFFICE SPACE

PREMIUM OFFICE SPACE—KELOWNA-MISSION
Two offices—one available on 1 September, one on 30 September, 2020—in shared 1800 sq. ft. office space. Shared use of two to four exam rooms, procedure room, waiting room, kitchenette, etc., and reserved parking. Very bright four-physician view office in Mission Centre, 3320 Richter Street. Suitable for specialty practice, currently two urologists in place. Rent or lease.
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MISCELLANEOUS

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VANCOUVER—TAX AND ACCOUNTING SERVICES

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, email: rodney@rwmcga.com, phone: 778 552-0229.

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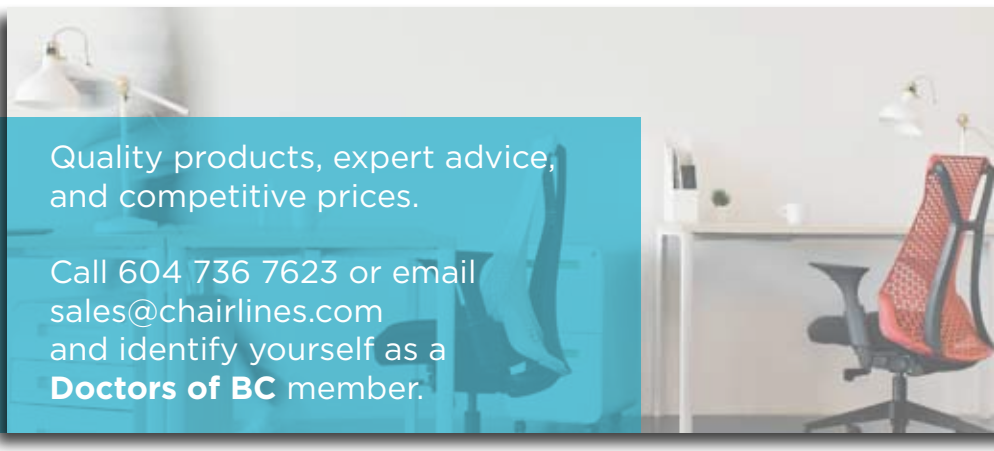

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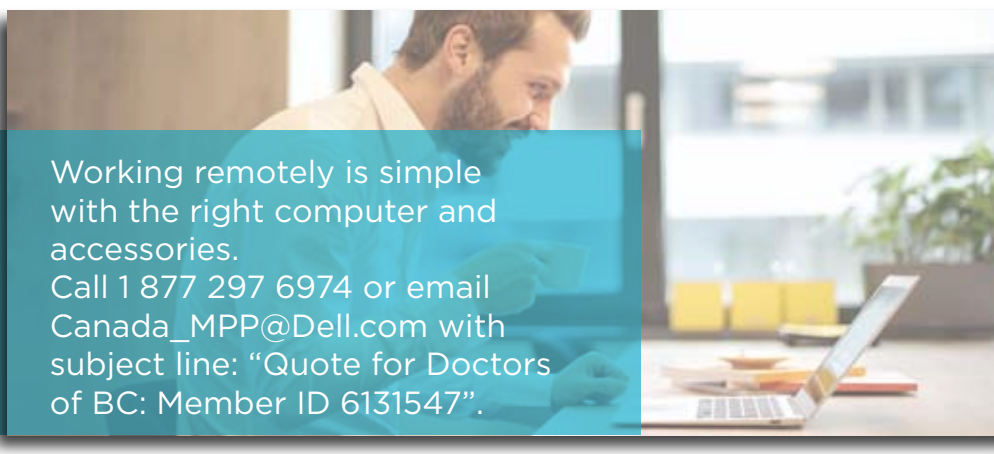

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UBC Department of Medicine

The UBC Department of Medicine is launching a new program at the intersection of health and data science. This interactive event is designed to enable engagement and collaboration with data scientists, and provide a practical roadmap for applying data science and analytics in health care and research.

DATA SCIENCE & HEALTH 2020

NOVEMBER 3, 2020
12 TO 3 PM

Learn about:

- FUNDAMENTALS
  What is data science and how do you do it?
- APPLICATIONS IN HEALTH RESEARCH
  How is data science changing the fields of cognition, echocardiography, imaging, digital health, emergency medicine and oncogenomics?
- IMPACT ON INNOVATION
  How can data science drive innovation in health? What role does the BC Digital Supercluster play?
- IMPACT ON HEALTH CARE MANAGEMENT
  How do we access clinical data? What role do data analytics play in health care? What is federated learning?

KEYNOTE: BIG DATA AND BIG TECH IN HEALTHCARE

Dr. Helia Mohammadi
Chief Data Scientist,
Canadian National Healthcare, Microsoft

KEYNOTE: MOVING RESEARCH TO THE BEDSIDE

Dr. Douglas Kingsford
Provincial CMIO,
BC Ministry of Health

1 year
Online access to materials on **Canvas**

Nov 3, 2020
Interactive discussions on **Zoom**

Winter 2020/1
Access to **hands-on workshops** with data scientists

7.5
MOC1/ Mainpro+ Credits

Accredited by UBC CPD
CONTINUING PROFESSIONAL DEVELOPMENT
FACULTY OF MEDICINE

Register:
bit.ly/DataScienceHealth
Contact us:
dom.research@ubc.ca

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LivingWell Companion™ is a personal emergency response service that enables senior patients to live independently at home or on the go, knowing that they're connected to 24/7 support.

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At the push of a button or through automatic fall detection[1].

A more affordable medical alert service
Plans start at just $25/month with no term contracts or upfront fees[2].

TELUS reliability
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Special offer
2 months at $0.[4]

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1. If you do fall, do not wait for the automatic call, always press and hold the button for help when possible. 2. LivingWell Companion offers the lowest monthly price and life-time ownership costs of comparable no-term-contract and no-upfront-fee personal emergency response services in Canada. 3. As ranked by PCMag. Reprinted from www.pcmag.com with permission. 5. Offer expires December 31, 2020. To be eligible for the offer, customers must verbally mention the promotional code to the sales representative placing the order. Offer available to new customers who have not subscribed to TELUS LivingWell Companion in the last 90 days. First 2 months for $0 promotional pricing is available to new LivingWell Companion customers for LivingWell Companion Go, Home and Home with Fall Detection plans. Regular pricing applies from the end of the promotional period. Regular pricing is $25/mo for LivingWell Companion Home, $35/mo for Home with Fall and $55/mo. for Go. Offers and regular pricing are subject to change without notice. Cannot be combined with other promotional offers or discounts. Minimum system requirements apply. Not all products are available in all areas. Final eligibility for services will be determined by a TELUS epresentative.