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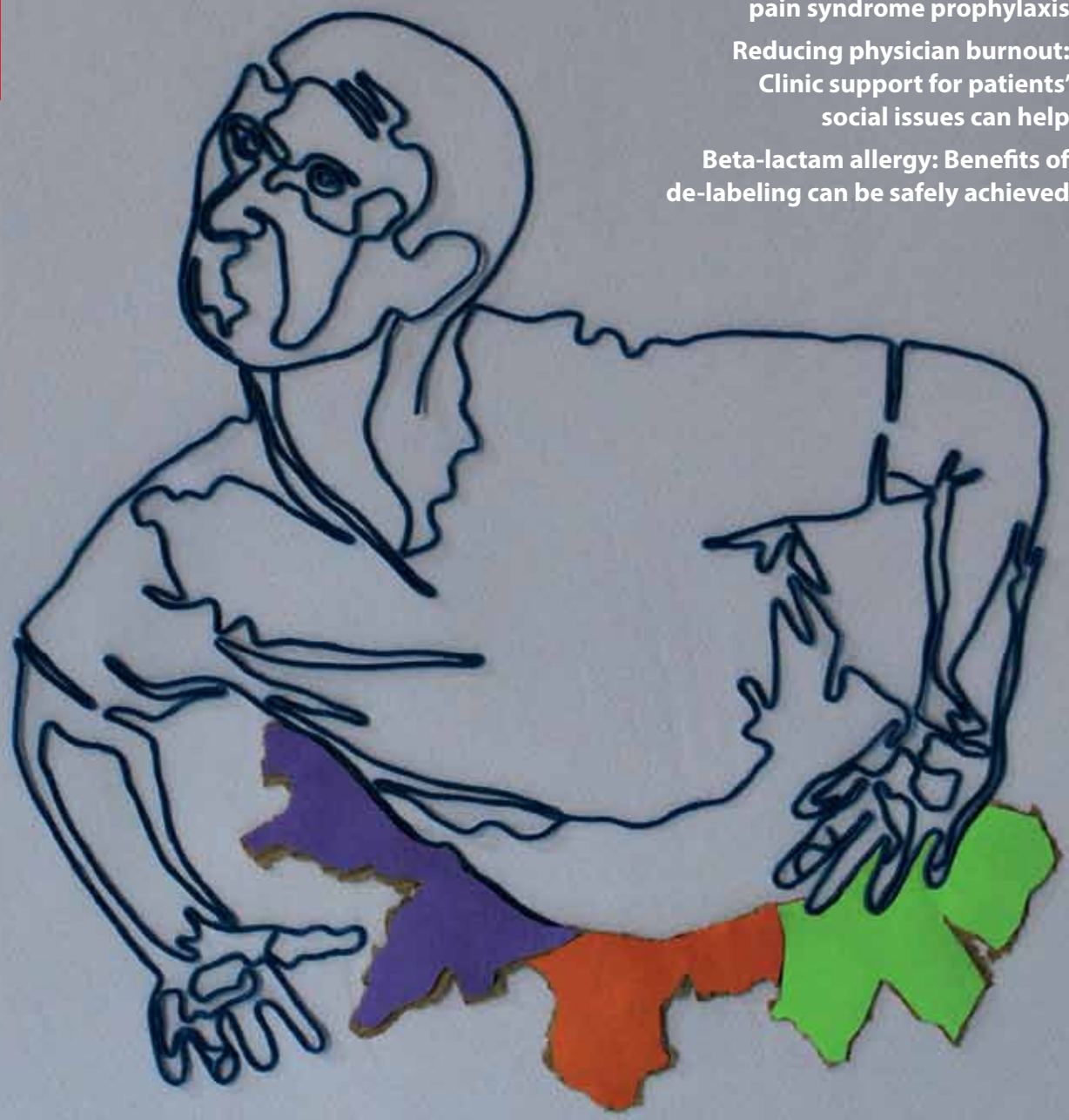

Pulmonary amyloidosis presenting as lung cavitation with bronchiectasis: A case report

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Despite the enormous benefits that stairs provide, there are dangers associated with their use, and current standards of stair design may need to change to optimize user safety. See page 360.

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ON THE COVER
Pulmonary amyloidosis presenting as lung cavitation with bronchiectasis: A case report
A 60-year-old patient struggling with recalcitrant pneumonias was found, after cytological evaluation, to have pulmonary amyloidosis.

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Dr Christopher Nguan, Mr Philip Edgcumbe, and Dr Robert Rohling (left to right) at the UBC Robotics and Control Lab. Mr Edgcumbe, a UBC medical student, won an Innovation grant to further develop the mini projector for surgery that he invented. *See page 354.*

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The time of your life

Both of my parents passed away this summer. They lived good lives and made it into their 80s, but it was still a shock to lose them so close together. It is a surreal experience to realize that this constant in your life doesn't exist anymore. They were always only a phone call away, even if I didn't make the call perhaps as often as I should have.

Families are complicated, as are relationships with your parents. I remember one of my friends joking that I was still thousands of dollars of therapy away from figuring out why I always seemed to feel like a little kid around my parents. Overall I think I did a pretty good job of keeping in touch with my folks as their health deteriorated over the last few years. However, it is all just so final (religious beliefs aside). They are gone and I can't help but miss them. Going through their things is a sobering process that causes me to muse about existence. Does life come down to a few objects left behind? I would prefer to think of it as a legacy of memories held by your friends and family.

My mother had a chronic connective tissue disease that slowly altered her body and restricted her mobility. I am sure she was always in some degree of discomfort, but she never complained. I will remember her stoic practicality as she directed the family's business from her recliner in the living room. My jokester father, ever the life of the party, filled every room with good humor even as his dementia progressed. I would like to think that I am a nice mix of practicality and jokester, but that is for others to judge. I can only hope that I have passed some good traits onto my children and grandchildren and that they hold fond memories of me in their hearts.

I am filled with sadness, which I am assured fades with time, but this experience caused me to reflect on birth, death, and the contributions we make in between. I want to try to make the world a better place in the time I have left. I want to give more of myself and build better relationships with those important to me so that their memories of me are good ones. I want to take better care of my patients and make their lives just a little bit better. I am going to strive to be a better man, husband, father, grandfather, physician, and more as losing my parents so close together has been a wakeup call. It is easy to fall for the illusion of unlimited future days, but this summer has been a stark reminder that time waits for no one. ■

—DRR

Access to medical records

"Doctor, can I see my chart?" The simple answer is, "Yes." But it is actually a lot more complicated than that. I recently met with a patient who had a complex medical history, involving numerous specialists over the years. She hoped to seek a medical opinion from the Mayo Clinic for her ongoing unexplained neurological symptoms.

The Mayo Clinic instructed her to obtain all her medical records, past lab work, past consultations, and actual medical images on CD, and to send everything to them within 1 month. They informed her that she would have to repeat each lab test or image that she wasn't able to provide at the Mayo Clinic, at her own cost. Of course, the patient's first step was to immediately make an appointment with her family physician.

Upon reviewing her chart, a few issues appeared. One, she was relatively new to our practice and her previous GP had not sent us her entire medical record, only various parts of it. Second, some of the specialists she had seen did not forward all her labs or imaging to her GP, they only discussed them in their consultation notes. Third, for various reasons, she often had her CT scans done in Vancouver but her MRIs done in Surrey. To obtain the actual images on CD she would have to go to each hospital and request them, and each request could take up to 7 business days. For a patient who has limited mobility and who does not drive, this is a tremendously difficult task.

This patient's frustration is understandable and I empathize with her situation greatly. Now that I am her family physician, our office has become responsible for her entire medical record. But the records in our office are often incomplete. It should not be such a difficult task for patients to access their own records, given that they are allowed to do so.

As health care providers, we often have to discuss sensitive, objective findings that may not necessarily align with a patient's point of view.

The responsibility for knowing your own health history should be shared between you as the patient and your health care provider. Steps *are* being taken to allow patients greater access to their medical records. For example, patients are now able to look up their own laboratory investigations. This increased access allows for more open conversations about the investigations ordered, but it can also create excessive worry and anxiety for patients. On the other hand, as health care providers, we often have to discuss sensitive, objective findings that may not necessarily align with a patient's point of view. If the patient were to have full access to this information, it could damage the therapeutic relationship.

The issue of patients having access to their own medical records is complex, and I look forward to seeing how it evolves. But as our medical system moves toward comprehensive, patient-centred care, it is crucial that medical information be more accessible for both patients and providers. ■

—YS

Has democratization and digitalization of health care eroded society's respect and need for physicians?

Historically, physicians were viewed as the go-to experts for advice and reassurance about medical conditions and often social/psychological issues as patients navigated their lives. The trusting long-term relationships between primary care physicians, patients, and communities were the cornerstone of this process. Doctors were expected to be the all-powerful Oz, dispensing valuable medical advice and choosing the best treatment methods. Recently, however, Dr Google has demystified and democratized medical knowledge. The Internet makes high-level knowledge available to the masses, but is this always helpful?

At a recent CMA Health Summit in Toronto, titled Connected in Care, there was a great deal of discussion about virtual care and patients' interest in the topic from the standpoint of access and convenience. Patients want to be informed, active participants in their health care. Physicians, governing bodies, and patients acknowledge that technology has the power to change the interactions between patients and their providers. Technology has the ability to empower patients. It allows them to better track their own health care indicators, including heart rate, activity levels, nutrition, blood glucose, etc. It can also improve health care delivery. The Ontario Telemedicine Network (OTN) pilot project, for example, allows patients who have an eating disorder to use an app to track their symptoms, interact with family physicians, and improve their participation in care.

But what risks does technology bring? Consumerism is driving change in all areas of our lives: banking, shopping, traveling, etc. It's a societal shift that is also altering how patients want to seek care. Much has been made of the need for physicians to improve their uptake of technology in medicine and reduce the many barriers for adoption. It is equally important that we consider the management of patients' expectations. How do we ensure that patients don't view virtual care carte blanche—as an all-access pass to health care? There are times when accessing virtual care makes sense, such as in remote and home-bound cases. But there are times when it may be easier for the patient to use their phone and not travel to the clinic and then often wait. Home-based self-monitoring programs under development in BC, such as TEC4home, should help reduce the number of times a frail or home-bound patient would visit a clinic to manage their chronic disease. With three frail elderly parents in my family, I see the benefit. However, we must ask questions of cost and sustainability. How do we teach patients to use tech appropriately and how do we make patients accountable? Will such access result in increased use or the need for an in-person consultation to follow the virtual visit when patients literally have a doctor in their pocket? How can a system that is already struggling for resources support duplication of services? How will care providers be compensated in a system historically built to suit in-person interactions? Should virtual care be compensated the same way as in-person care that requires an examination? Who should fund this type of interaction? Will this be the final step toward a private subscription service fee in our publicly funded health care system? What about equity for marginalized populations?

I have seen medication renewals for statins, hormone replacement, and thyroid medications without appropriate review of investigations, such as lab tests, pap exams, or a mammogram.

Patient safety issues for those accessing virtual episodic care also need to be considered. Patients will need to learn to identify when it is appropriate to see a doctor remotely versus in person. I have seen medication renewals for statins, hormone replacement, and thyroid medications without appropriate review of investigations, such as lab tests, pap exams, or a mammogram. Sending me a notice could trigger me to review these files and recall for the needed care in my after-hours time.

Virtual care providers will need to be better at screening and identifying when it is safer for patients to be seen in person. The "deep learning chat bots" or "augmented intelligence engines" already in use could help eliminate patients for whom virtual care is not appropriate before they ever speak to a provider. Pattern recognition is important; however, reading the patients for underlying social issues or stressors is best done face to face.

How will we address the critical need to ensure continuity of care for medically complex patients when so many studies show that this longitudinal care is better for patients and saves health care dollars? One of my patients recently had several tests ordered by a virtual care provider that had already been completed in my office. As the primary care physician, it falls to me to follow up on any tests ordered by

virtual care in my nonclinical time. Should the virtual care provider fund my time to review their work? I am aware of similar experiences from other physicians. I recently decided to track how often I saw patients and didn't actually examine them or refer to their chart for timely investigations, either related to chronic disease or screening. I was surprised that there were none over the course of several office days. Having said that, if I could have incorporated their personal wearable device data into their EMR, where the data is analyzed and summarized ahead of the visit, I could have renewed a few medications remotely. The increased murmur leading to the diagnosis of a dilated aortic root would have been missed; however, in the greater scope of practice this example is rare.

The CMA Health Summit highlighted that we need greater connectivity in our health care system. As with any new innovation, there is an uphill struggle to implement—as we all experienced and continue to experience implementing our EMRs/EHRs. The motivator lies in the understanding that once we get past that obstacle, we will somehow be better off. This remains a debatable issue in some physicians' offices.

Physicians may no longer be viewed as the sole keepers of health care knowledge, but our role as trusted care providers and companions for patients on their lifelong health care journeys is not so easily replaced. Let's support ongoing development of technology that provides better access to care and seamless sharing of health care data in a way that makes sense for patients and their families. Let's not forget to include and value the important part physicians play as we implement the many technological evolutions headed our way. Even with the curtain down, we are still Oz. ■

—Kathleen Ross, MD
Doctors of BC President

Brett Baumann, MD, Davide Salina, MD, PhD, FRCPC, Kewan Aboulhosn, MD, FRCPC

Pulmonary amyloidosis presenting as lung cavitation with bronchiectasis: A case report

The case of a 60-year-old female whose initial clinical findings were ambiguous demonstrates the utility of amyloid subtype analysis.

ABSTRACT: Amyloidosis is the extracellular deposition of amyloid fibril protein in any tissue or organ. Pulmonary amyloidosis is a localized form of amyloid deposition that is confined to the lung parenchyma and can cause airway obstruction, dysphagia, and chronic pleural effusions. When a 60-year-old female presented with chronic cough and recalcitrant pneumonias she was sent for imaging investigations and found to have cavitation with bronchiectasis of the right upper lobe. The patient subsequently underwent diagnostic bronchoscopy and bronchoalveolar lavage to obtain specimens for testing. Cytological evaluation revealed pulmonary amyloidosis in the area of cavitation, and the patient was diagnosed with a monoclonal gammopathy of unknown significance. Given her autoimmune hepatitis and her monclonal gammopathy, her amyloid sample was subtyped using laser capture microdissection, liquid chromatography, and tandem mass spectrometry, and the patient was found to have AL kappa type amyloidosis stemming from her monoclonal gammopathy. Given the localized extent of her amyloidosis, chemotherapy was deferred and close clinical follow-up was planned. This case of pulmonary amyloidosis demonstrates the utility of amyloid subtype analysis in clinically ambiguous situations to determine further workup and future follow-up.

Dr Baumann is completing a residency in internal medicine at the University of British Columbia. Dr Salina is a pathologist at Royal Jubilee Hospital in Victoria and a clinical assistant professor in the Department of Pathology and Laboratory Medicine at the University of British Columbia. 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.

Amyloidosis is the extracellular deposition of insoluble amyloid fibrilprotein in any tissue or organ.[1] The most common subtypes of the disease are AL amyloidosis and AA reactive amyloidosis.[1] AL amyloidosis is a systemic disease caused by immunoglobulin light chain fragments, while AA amyloidosis is a potential complication of recurrent inflammation leading to the production of serum amyloid A, an acute phase reactant.[2] Pulmonary amyloidosis is a localized form of amyloid deposition that is confined to the lung parenchyma.[3] Consequences of pulmonary amyloidosis include hoarseness, stridor, airway obstruction, dysphagia, chronic pleural effusions, and pulmonary hypertension.[4]

Case data

A 60-year-old female with a 6-month history of chronic cough and recalcitrant pneumonias was referred to a community respirologist. An X-ray image **[Figure 1]** and CT images **[Figure 2]** showed a cystic consolidation in the right upper lobe that was concerning for cavitation with bronchiectasis.

The patient's past medical history was notable for type 2 diabetes mellitus and autoimmune hepatitis with esophageal varices. The

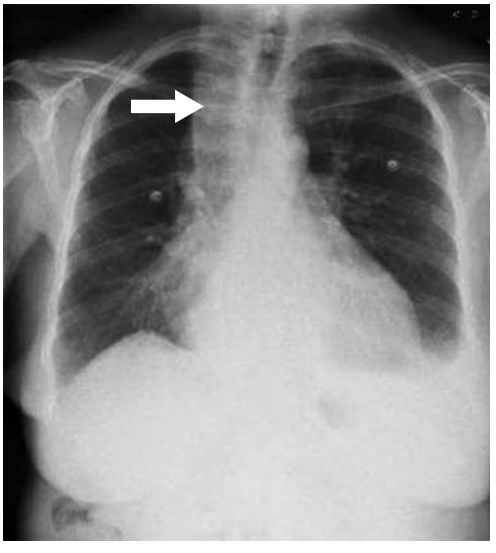


FIGURE 1. An anteroposterior radiograph shows right upper lobe consolidation (arrow).

initial differential diagnosis included infectious disease leading to cavitation and bronchiectasis, such as a polymicrobial bacterial infection, nocardiosis, actinomycosis, and tuberculosis. Malignancy and inflammatory conditions were also considered.

A bronchoscopy revealed a difficult-to-access right upper lobe with a friable endobronchial lining. Bronchoalveolar lavage was undertaken to obtain specimens for cytological evaluation, white blood cell count and differential, and bacterial, fungal, and mycobacterium cultures. Pulmonary amyloidosis was confirmed by cytology, with results from Congo Red staining considered diagnostic **[Figure 3]**.

As part of the workup for her newly diagnosed pulmonary amyloidosis, the patient underwent a serum protein electrophoresis test. A diagnosis of monoclonal gammopathy of unknown significance (MGUS) was made based on the presence of immunoglobulin class IgG and lambda type free light chain.[5] A urine protein electrophoresis test found no abnormalities. A bone marrow biopsy showed no advanced blood cell dyscrasias or amyloid deposition. No systemic signs of multiple myeloma were found, with tests revealing a normal serum calcium level, normal renal function, and no proteinuria. A skeletal survey revealed no lytic bone lesions. No cutaneous findings, heart failure findings, or peripheral neuropathies were identified when other organs likely to be affected by amyloidosis were assessed.[6]

Because of the multiple potential causes for the patient's pulmonary amyloidosis, including her previously known autoimmune hepatitis and newly diagnosed MGUS, the amyloid samples from her bronchoalveolar lavage were sent to the Mayo Clinic for further analysis. Testing revealed AL kappa type amyloid deposits. These findings pointed to the patient's amyloid lung deposition being secondary to

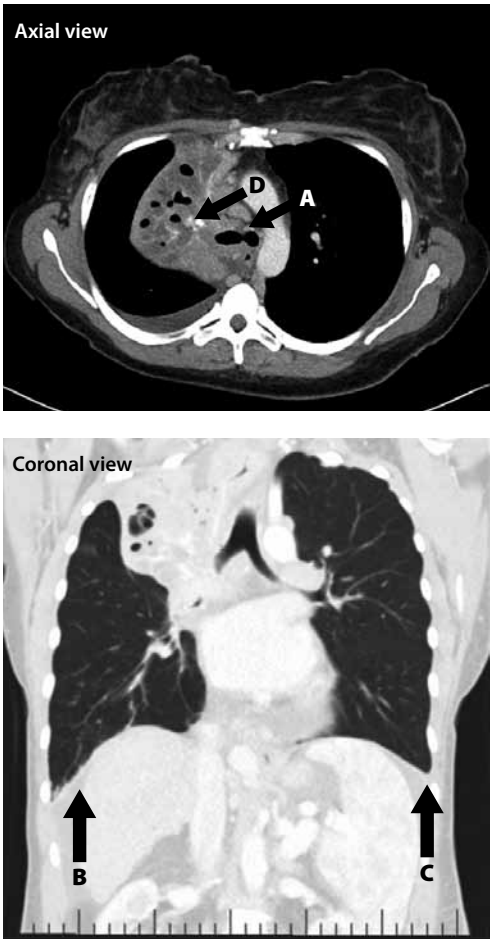


FIGURE 2. CT images show mass-like area of consolidation involving the entire right upper lobe. Central lucencies indicate multiple locules consistent with cavitation. Both coronal and axial views show that the right upper lobe bronchus is completely obstructed. Right-sided paratracheal lymph nodes (arrow A) can be seen. A small right-sided pleural effusion (arrow B), a minimal left-sided pleural effusion (arrow C), and calcification (arrow D) can also be seen.

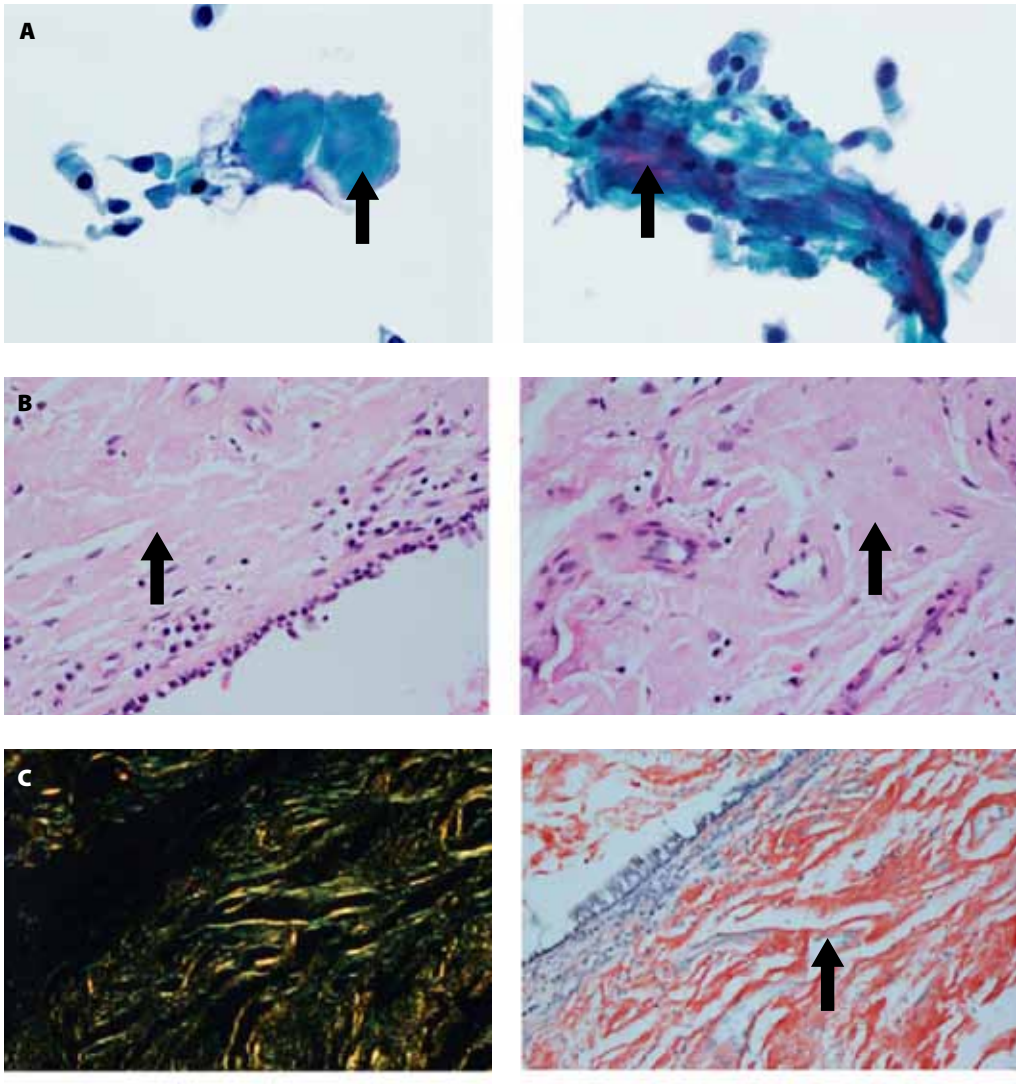


FIGURE 3. Cytological evaluation of fluid from bronchoalveolar lavage confirms pulmonary amyloidosis. A: Ciliated bronchial epithelial cells surrounded by dense cyanophillic material morphologically consistent with amyloid deposition (arrows). B: Tissue fragments of intact bronchial epithelium with salmon-pink amorphous deposition within the underlying interstitium and surrounding blood vessels (arrows). C: Apple-green birefringence under polarized light after Congo Red staining (arrow).

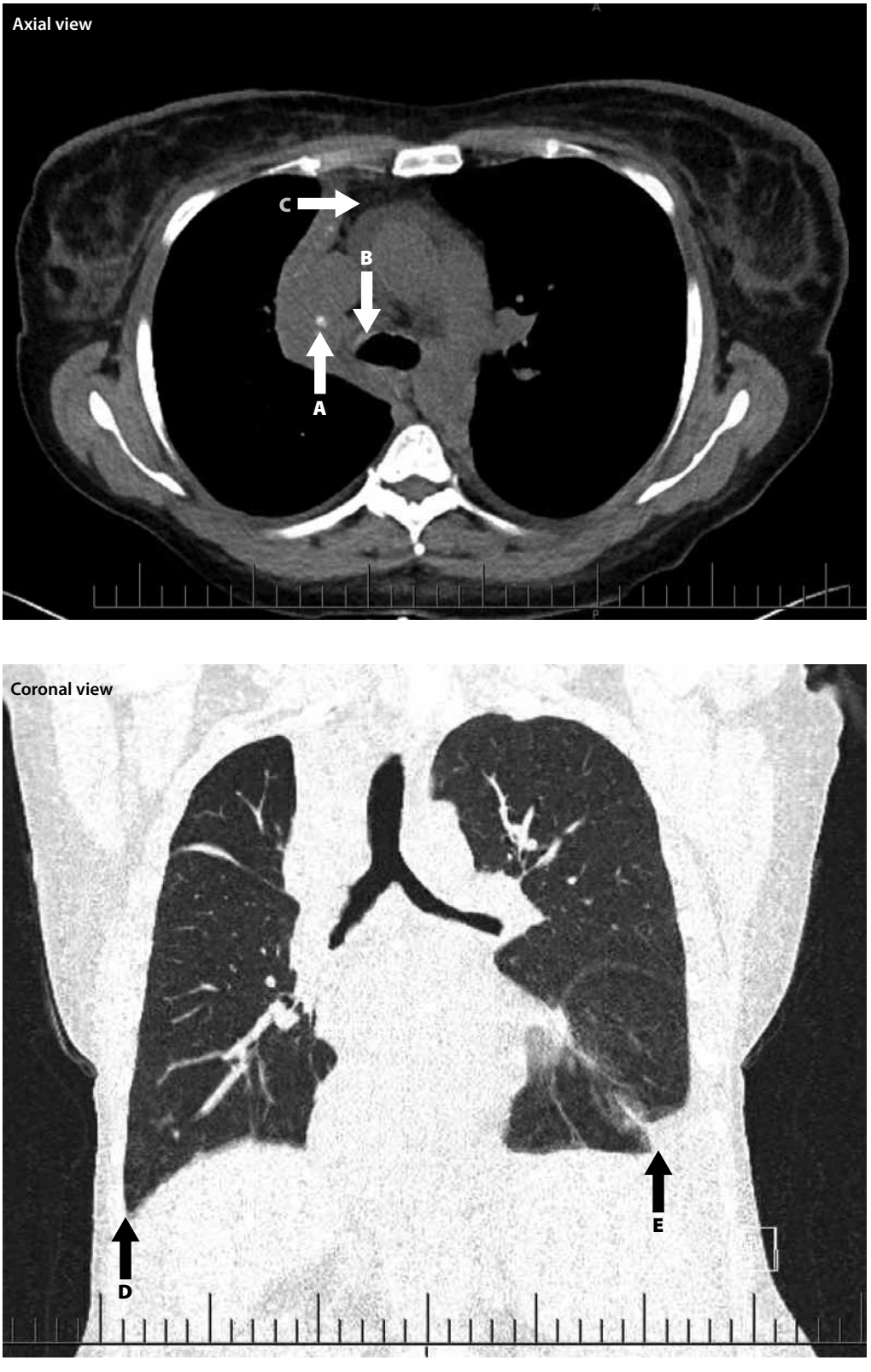


FIGURE 4. CT images obtained for reassessment of the patient reveal further collapse and consolidation of the right upper lobe and obstruction of the upper lobe bronchus. Regions of calcification (arrow A) can be seen within the area of collapse and consolidation, which may lie within the bronchus. Persistent enlargement of paratracheal lymph nodes (arrow B) can be seen. Since the initial CT images were obtained a pericardial effusion (arrow C) has become evident, the right-sided pleural effusion (arrow D) has decreased, and the left-sided pleural effusion has increased (arrow E).

her MGUS. Given the localized extent of the patient's amyloidosis, a decision was made in conjunction with the patient's hematologist to defer chemotherapy and plan for close clinical follow-up.

The patient was reassessed 5 months after her initial bronchoscopy. Although CT images obtained for reassessment showed a complete collapse of the right upper lobe **[Figure 4]**, her cough had resolved and her exercise tolerance remained normal. She had no classic signs of systemic amyloidosis on reassessment but was found to have atrial fibrillation, and her echocardiogram showed evidence of elevated pulmonary artery pressures, with a moderately elevated right ventricular systolic pressure of 53 mm Hg.

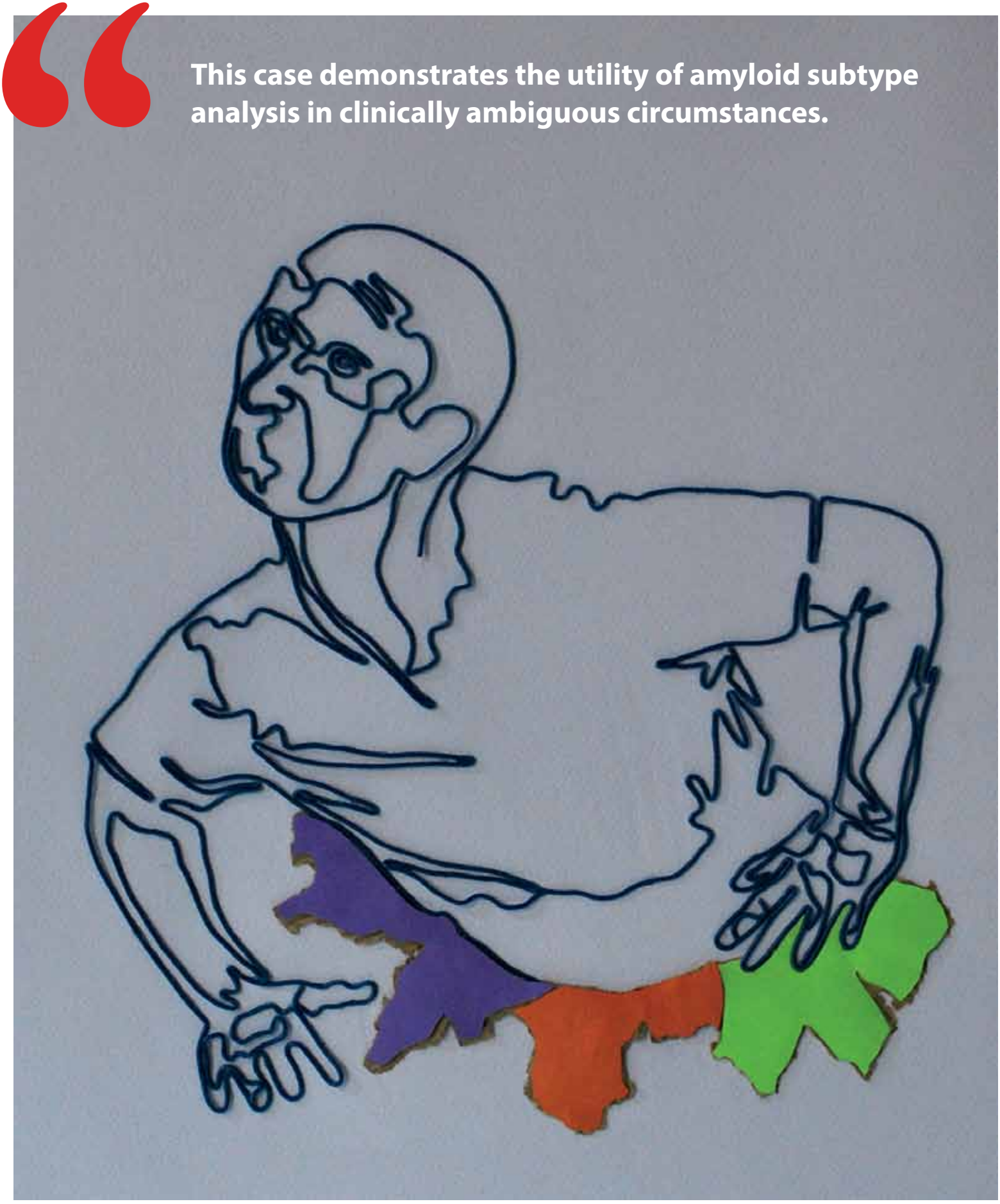
Discussion

In this case amyloid typing was necessary because there were at least two potential mechanisms for the patient's amyloidosis: her MGUS (AL amyloidosis) and her autoimmune hepatitis (AA amyloidosis). The diagnosis of AL amyloidosis could not be assumed based on the presence of monoclonal light chains in the serum because it is not uncommon for a patient with another form of amyloidosis to have a concomitant and unrelated MGUS.[5]

Historically, amyloid typing has been performed using immunohistochemistry and immunofluorescence analysis.[6] However, immunohistochemistry can yield inconclusive results because the antigenic epitope may be lost during tissue preparation and samples may be contaminated by serum proteins that result in high background staining.[7] The Mayo Clinic uses laser capture microdissection of clinical biopsy samples followed by liquefied chromatography combined with tandem mass spectrometry to identify the subtype of amyloid with a high degree of accuracy. Testing for this case revealed AL kappa type amyloid deposits and indicated the patient's amyloid lung deposition was secondary to her MGUS.

The elevated pulmonary artery pressures and atrial fibrillation found when the patient was reassessed are in keeping with reports that have cited pulmonary hypertension and lobar atelectasis as sequelae of AL pulmonary amyloidosis.[8-10] Increased left ventricular wall

This case demonstrates the utility of amyloid subtype analysis in clinically ambiguous circumstances.



thickness is the most common feature of cardiac amyloidosis[11] and was not seen in this patient, while atrial fibrillation, which affects up to 20% of systemic amyloidosis cases,[11] was eventually diagnosed in this patient.

Current management of amyloidosis is based on treatment of the underlying cause of the abnormal deposition of proteins in extracellular sites. Treatment may involve chemotherapy, immunosuppression, stabilizer proteins, or small interfering ribonucleic acids, depending on the amyloid subtype identified.[12] AL amyloidosis, which is caused by abnormal immunoglobulin light chain production by a plasma cell neoplasm, can be treated with high-dose chemotherapy and/or stem cell transplantation.[13,14] The preferred therapy for AA amyloidosis is control of the underlying inflammatory disease and thus suppression of serum amyloid protein production. ATTR amyloidosis, which is caused by a mutation in the transthyretin (TTR) gene, can be treated with liver transplantation or tafamidis, a chaperone protein for the stable form of transthyretin.[15]

Treatment may involve chemotherapy, immunosuppression, stabilizer proteins, or small interfering ribonucleic acids, depending on the amyloid subtype identified.

Given the risks associated with amyloidosis and the progressive nature of the disorder, a prognosis relies on accurate identification of specific amyloid subtypes, which can vary in invasiveness and require drastically different therapies. As the number of unique protein aggregates identified via tandem mass spectrometry increases and targeted therapies become more widely available, subtype identification will undoubtedly become more important.

Summary

The patient in this case was found to have cavitation with bronchiectasis in the right upper lobe, initially thought to be secondary to infection. She underwent a bronchoscopy and bronchoalveolar lavage. Based on cytological evaluation, including Congo Red staining, she was eventually diagnosed with pulmonary amyloidosis. Because of the multiple potential causes for this disorder, the patient's amyloid samples were sent to the Mayo Clinic for further analysis using laser capture microdissection, liquid chromatography, and tandem mass spectrometry. Testing revealed AL kappa type amyloid deposits and contributed to the decision made to defer chemotherapy and plan for close clinical follow-up.

This case demonstrates the utility of amyloid subtype analysis in clinically ambiguous circumstances. Management of localized pulmonary amyloidosis is dependent on the severity of symptoms, and asymptomatic patients may not require treatment. ■

Competing interests

None declared.

References

1. Sipe JD, Benson MD, Buxbaum JN, et al. Amyloid fibril protein nomenclature: 2010 recommendations from the nomenclature committee of the International Society of Amyloidosis. Amyloid 2010;17:101-104.
2. Kyle RA. Amyloidosis: A convoluted story. J Haematol 2001;114:529-538.
3. Suzuki H, Matsui K, Hirashima T, et al. Three cases of the nodular pulmonary amyloidosis with a long-term observation. Intern Med 2006;45:283-286.
4. Dahl KA, Kernstine KH, Vannatta TL, et al. Tracheobronchial amyloidosis: A surgical disease with long-term consequences. J Thorac Cardiovasc Surg 2004;128:789-792.
5. Guidelines Working Group of UK Myeloma Forum; British Committee for Standards in Haematology, British Society for Haematology. Guidelines on the diagnosis and management of AL amyloidosis. Br J Haematol 2004;125:681-700.
6. Gertz MA, Comenzo R, Falk RH, et al. Definition of organ involvement and treatment response in immunoglobulin light chain amyloidosis (AL): A consensus opinion from the 10th International Symposium on Amyloid and Amyloidosis, Tours, France, 18-22 April 2004. Am J Hematol 2005;79:319-328.
7. Holub D, Flodrova P, Pika T, et al. Mass spectrometry amyloid typing is reproducible across multiple organ sites. BioMed Res Int 2019. doi: 10.1155/2019/3689091.
8. Cirulis MM, Emerson LL, Bull DA, et al. Pulmonary arterial hypertension in primary amyloidosis. Pulm Circ 2016;6:244-248.
9. Eder L, Zisman D, Wolf R, Bitterman H. Pulmonary hypertension and amyloidosis—an uncommon association: A case report and review of the literature. J Gen Intern Med 2007;22:416-419.
10. Price LC, McAuley DF, Marino PS, et al. Pathophysiology of pulmonary hypertension in acute lung injury. Am J Physiol Lung Cell Mol Physiol 2012;302:L803-L815.
11. Murtagh B, Hammill SC, Gertz MA, et al. Electrocardiographic findings in primary systemic amyloidosis and biopsy-proven cardiac involvement. Am J Cardiol 2005;95:535.
12. Coelho T, Adams D, Silva A, et al. Safety and efficacy of RNAi therapy for transthyretin amyloidosis. N Engl J Med 2013;369:819-829.
13. Dispenzieri A, Seenithamby K, Lacy MQ, et al. Patients with immunoglobulin light chain amyloidosis undergoing autologous stem cell transplantation have superior outcomes compared with patients with multiple myeloma: A retrospective review from a tertiary referral center. Bone Marrow Transplant 2013;48:1302-1307.
14. Palladini G, Sachchithanantham S, Milani P, et al. A European collaborative study of cyclophosphamide, bortezomib, and dexamethasone in upfront treatment of systemic AL amyloidosis. Blood 2015;126:612-615.
15. Coelho T, Maia LF, Martins da Silva A, et al. Tafamidis for transthyretin familial amyloid polyneuropathy: A randomized, controlled trial. Neurology 2012;79:785-792.

Vitamin C for complex regional pain syndrome prophylaxis

Complex regional pain syndrome (CRPS), previously known as reflex sympathetic dystrophy (RSD) and causalgia, can be a debilitating complication of pain associated with limb trauma, including surgery. CRPS is associated with autonomic, sensory, and motor abnormalities, as well as physical changes to the skin and bone. Diagnosis is based on the Budapest Criteria (see box). CRPS can affect patients' work, social activities, and psychological well-being. If started early, available treatments can be effective, but some patients suffer indefinitely.

With limited treatments and often poor outcomes, prevention of CRPS would be ideal. A 1999 randomized, double-blind study proposed vitamin C as possible prophylaxis for CRPS after distal radius fracture. Subsequent studies varied in supporting these findings or found no difference in outcomes. A 2013 systematic review and meta-analysis found that vitamin C 500 mg daily for 45 to 50 days posttrauma may help reduce the occurrence of CRPS; while a 2015 meta-analysis of only three larger studies found no difference in outcome. The latter meta-analysis noted that one study showing no difference used different diagnostic criteria than the two that found vitamin C prophylactic (all used pre-Budapest criteria). A 2017 systematic review and meta-analysis found that vitamin C (500 mg daily for 50 days) may halve the risk of CRPS within the first year after a distal radius fracture.

So that's nice, but should we be giving vitamin C after distal radius fracture or foot and ankle trauma, the areas with the most research so far? The Royal College of Physicians in the UK updated its guidelines for diagnosis and management of CRPS in 2018. While the College did not include vitamin C in the main section, appendix 7, Post-fracture/operation patient information leaflet, states that "Vitamin C 500 mg daily for the first 6 weeks may help to reduce the risk of complications." The American Academy of Orthopaedic Surgeons Clinical Practice Guidelines on Distal Radius Fractures recently downgraded the recommendation of adjuvant vitamin C to moderate, noting limitations in the available literature. And that probably says it best: the literature suggested that vitamin C may reduce the chance of developing CRPS but is not conclusive and further studies are needed. In the meantime, vitamin C (500 mg daily for 5 to 6 weeks) is extremely low risk and there is moderate evidence that it reduces the chance of developing a potentially debilitating complication. ■

—Derek Smith, MD, FRCSC
WorkSafeBC Special Advisor, Orthopaedic Surgery

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

Suggested reading

Aim F, Klouche S, Frison A, et al. Efficacy of vitamin C in preventing complex regional pain syndrome after wrist fracture: A systematic review and meta-analysis. Orthop Traumatol Surg Res 2017;103:465-470.

Bharwani KD, Dirckx M, Huygen FJPM. Complex regional pain syndrome: Diagnosis and treatment. BJA Educ 2017;17:262-268.

Bussa M, Mascaro A, Cuffaro L, Rinaldi S. Adult complex regional pain syndrome type I: A narrative review. PM R 2017;9:707-719.

Evaniew N, McCarthy C, Kleinlugtenbelt YV, et al. Vitamin C to prevent complex regional pain syndrome in patients with distal radius fractures: A meta-analysis of randomized controlled trials. J Orthop Trauma 2015;29:e235-241.

Goebel A, Barker CH, Turner-Stokes L, et al. Complex regional pain syndrome in adults: UK guidelines for diagnosis, referral and management in primary and secondary care. London: RCP 2018.

Harden RN, Bruehl S, Perez RS, et al. Validation of proposed diagnostic criteria (the "Budapest Criteria") for complex regional pain syndrome. Pain 2010;150:268-274.

Shibuya N, Humphers JM, Agarwal MJ, Jupiter DC. Efficacy and safety of high-dose vitamin C on complex regional pain syndrome in extremity trauma and surgery-systematic review and meta-analysis. J Foot Ankle Surg 2013;52:62-66.

Zollinger PE, Tuinebreijer WE, Breederveld RS, Kreis RW. Can vitamin C prevent complex regional pain syndrome in patients with wrist fractures? A randomized, controlled, multicenter dose-response study. J Bone Joint Surg Am 2007;89:1424-1431.

Zollinger PE, Tuinebreijer WE, Kreis RW, Breederveld RS. Effect of vitamin C on frequency of reflex sympathetic dystrophy in wrist fractures: A randomised trial. Lancet 1999;354(9195):2025-2028.

Budapest criteria for CRPS

1. Continuing pain, which is disproportionate to any inciting event.
2. Report of at least one symptom in three of the four following:
   - Sensory—hyperesthesia and/or allodynia
   - Vasomotor—temperature asymmetry and/or skin color changes and/or skin color asymmetry
   - Sudomotor/edema—edema and/or sweating changes and/or sweating asymmetry
   - Motor/trophic—decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin)
3. Evidence of at least one sign at time of evaluation in two or more of the following:
   - Sensory—hyperalgesia (to pinprick) and/or allodynia (to light touch and/or deep somatic pressure and/or joint movement)
   - Vasomotor—temperature asymmetry and/or skin color changes and/or skin color asymmetry
   - Sudomotor/edema—edema and/or sweating changes and/or sweating asymmetry
   - Motor/trophic—decreased range of motion and/or motor dysfunction (weakness, tremor, dystonia) and/or trophic changes (hair, nail, skin)
4. No other diagnosis that better explains the signs and symptoms.

Beta-lactam allergy: Benefits of de-labeling can be achieved safely

Far too many patients carry an inaccurate label of beta-lactam allergy and consequently receive alternative antibiotics, often with too broad a spectrum, a higher risk of adverse events, an increased chance of selecting for resistance, and greater cost. Ten percent of patients are labeled with a penicillin allergy and 2% with a cephalosporin allergy. Yet, among patients with a reported penicillin allergy, only 5% to 8% of adults and 2% of children have a positive penicillin skin test.[1-3] This disconnect may result from a poor understanding of allergy by patients and a lack of useful assessment tools in many primary care settings. An episode of gastrointestinal intolerance can be reported as an allergy. A viral rash that shows up after initiation of antibiotics may be mislabeled as an allergy. Some assume that antibiotic allergies are familial and label a relative. Even when the initial label is accurate, we often fail to acknowledge that the risk of repeat IgE-mediated hypersensitivity to similar drugs diminishes with time, falling 80% over 10 years.[4]

In dentistry, substitution to clindamycin makes up 13% of all prescriptions in BC, significantly increasing the risk for adverse events such as *C. difficile* infection. Efforts should be made to investigate the nature of the allergy and determine if patients can safely receive a beta-lactam, even in the setting of a well-documented prior reaction. Avoiding unnecessary substitutions or staying within the beta-lactam

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

Beta-lactam Antibiotic Cross-Allergy Chart

Beta-lactams	AMOXICILLIN*	AMPICILLIN	CLOXACILLIN	PENICILLIN	PIPERACILLIN*	CEFADROXIL	CEFAZOLIN	CEPHALEXIN	CEFOXITIN	CEFPROZIL	CEFUROXIME	CEFIXIME	CEFOTAXIME	CEFTAZIDIME	CEFTRIAXONE	CEFEPIME	ERTAPENEM	IMIPENEM	MEROPENEM
AMOXICILLIN*		X[1]	X[5]	X[4]	X[3]	X[1]	✓	X[1]	✓	X[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓
AMPICILLIN	X[1]		X[5]	X[4]	X[3]	X[2]	✓	X[2]	✓	X[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓
CLOXACILLIN	X[5]	X[5]		X[5]	X[5]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PENICILLIN	X[4]	X[4]	X[5]		X[5]	✓	✓	✓	X[3]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PIPERACILLIN*	X[3]	X[3]	X[5]	X[5]		X[3]	✓	X[3]	✓	X[3]	✓	✓	✓	✓	✓	✓	✓	✓	✓
CEFADROXIL	X[1]	X[2]	✓	✓	X[3]		✓	X[1]	✓	X[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓
CEFAZOLIN	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CEPHALEXIN	X[1]	X[2]	✓	✓	X[3]	X[1]	✓		✓	X[2]	✓	✓	✓	✓	✓	✓	✓	✓	✓
CEFOXITIN	✓	✓	✓	X[3]	✓	✓	✓	✓		✓	X[2]	✓	✓	✓	✓	✓	✓	✓	✓
CEFPROZIL	X[2]	X[2]	✓	✓	X[3]	X[2]	✓	X[2]	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
CEFUROXIME	✓	✓	✓	✓	✓	✓	✓	✓	X[2]	✓		X[3]	X[1]	X[3]	X[1]	X[2]	✓	✓	✓
CEFIXIME	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[3]		X[3]	X[3]	X[3]	X[3]	✓	✓	✓
CEFOTAXIME	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[1]	X[3]		X[3]	X[1]	X[1]	✓	✓	✓
CEFTAZIDIME	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[3]	X[3]	X[3]		X[3]	X[3]	✓	✓	✓
CEFTRIAXONE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[1]	X[3]	X[1]	X[3]		X[1]	✓	✓	✓
CEFEPIME	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[2]	X[3]	X[1]	X[3]	X[1]		✓	✓	✓
ERTAPENEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		X[5]	X[5]
IMIPENEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[5]		X[5]
MEROPENEM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X[5]	X[5]	

* Also applies to beta-lactamase inhibitor combinations (amoxicillin-clavulanate and piperacillin-tazobactam)

AVOID ALL beta-lactam antibiotics if:

- ICU admission related to allergy
- Delayed beta-lactam antibiotic allergy causing:
  - interstitial nephritis
  - hepatitis
  - hemolytic anemia
- Delayed severe skin allergic reactions:
  - Stevens-Johnson syndrome
  - toxic epidermal necrolysis
  - exfoliative dermatitis
  - acute generalized exanthematous pustulosis (AGEP)
  - drug reaction with eosinophilia and systemic symptoms (DRESS)

LEGEND:	
Penicillins	
1st Generation Cephalosporins	
2nd Generation Cephalosporins	
3rd Generation Cephalosporins	
4th Generation Cephalosporins	
Carbapenems	
✓	Different structure. CONSIDERED SAFE TO PRESCRIBE
Reaction likely based on side chain:	
X[1]	Same side chain - clinical evidence of cross reaction. DO NOT PRESCRIBE
X[2]	Same side chain - Theoretical risk of cross reaction, no clinical studies. DO NOT PRESCRIBE
X[3]	Similar side chain - Potential for cross reaction. DO NOT PRESCRIBE
Reaction likely based on Beta-lactam ring	
X[4]	Clinical evidence of cross reaction. DO NOT PRESCRIBE
X[5]	Theoretical risk of cross reaction, no clinical studies. DO NOT PRESCRIBE

FIGURE 1. Beta-lactam cross-allergy chart.

Source: Interior Health Authority.

class, when safe, can bring both clinical and public health benefits.

Traditional teaching attributes beta-lactam allergy to the commonality of the beta-lactam ring implying broad cross-reactivity between beta-lactams. This probably applies mostly to penicillins but not cephalosporins. Recently, it has been recognized that cross-reactivity is predominantly due to side chain similarity when it comes to cephalosporins. Those with only minor and delayed allergic symptoms such as a rash do not have an absolute contraindication to beta lactam use and can be safely retreated using guidance around cross reactivity. **Figure 1** is a chart from the Interior Health Authority that illustrates when this risk is present or absent. Keeping a graphic like this as an office wall chart can aid decisions on subsequent antibiotic therapy. Many people with minor reactions who receive the same agent years later do not have a repeat reaction.

The goal of an allergy assessment strategy is to allow use of the most optimal antibiotic and make sure that any ongoing documentation of allergy is accurate. An effective assessment should employ a short, logical series of questions possibly aided by a flowchart (e.g., **Figure 2**). What were the symptoms that led to the diagnosis of allergy? How soon after first receiving the drug were they experienced? Was there severe wheezing or swelling of the mouth or throat consistent with anaphylaxis? Were there any very severe manifestations such as Stevens-Johnson syndrome or interstitial nephritis, and did the reaction take your patient to an ICU?

Following such questions, patients who merely had GI intolerance, an unpleasant taste in the mouth, a headache, or other nonallergic symptoms might have their allergy label removed. This can be documented on their chart, by handing them information, and ideally should prompt a revision to the Pharmacare record. The BC Provincial Antimicrobial Clinical Experts are developing a standardized practice guideline and tools for hospital stewardship programs for de-labeling beta-lactam allergies.

Anaphylaxis history rightly deserves more caution and can benefit from further assessment by an allergist, but cross-reactions to agents with a different R1 side chain are rare. Some more severe reactions such as Stevens-Johnson syndrome, interstitial nephritis, and hemolytic anemia [**Figure 1**] represent an ongoing contraindication to beta-lactam use.

All professions involved in prescribing and administering antibiotics play a role in accurate labeling of allergies. We need to engage pharmacists, dentists, nurses, and others in the effort. Allergy specialists do not have the capacity to evaluate every case, but consultation may be wise if there is a history of anaphylaxis or other severe outcome or a high likelihood of needing to treat with an agent to which there has been a true allergic reaction. If we focus on accurately charting beta-lactam allergy status, we can increase the efficacy and safety of treatment while decreasing costs and risk. ■

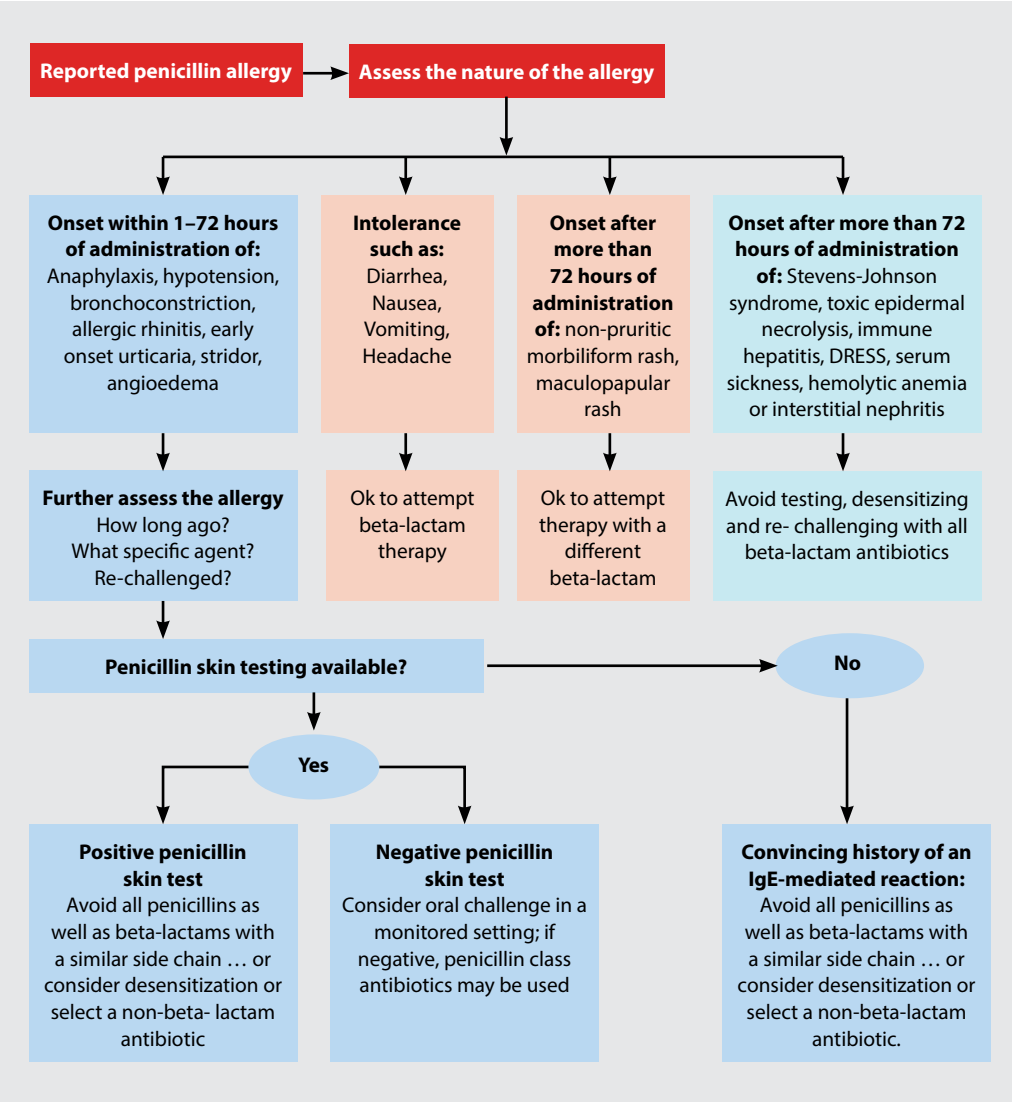


FIGURE 2. **Flowchart from New Brunswick for assessing penicillin allergy.**
Source: New Brunswick Provincial Health Authorities Anti-infective Stewardship Committee (https://en.horizonnb.ca/media/951180/antimicrobial_treatment_guidelines_for_common_infections_en.pdf)

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Reducing physician burnout: Clinic support for patients' social issues can help

The Canadian Medical Association Statement on Physician Health and Wellness identifies physician health as a quality indicator in the overall functioning of health systems[1]—in effect, positioning physician health as an additional component of the triple aim[2] (the GPSC's version of which identifies the priority of "improving the patient *and provider* experience of care," along with improving the health of populations and reducing the per capita cost of health care). Preventing burnout is recognized as a significant component in ensuring physicians feel healthy and able to continue providing access and support for their patients.

A recent pamphlet published by the Physician Health Program[3] notes that physician burnout is more prevalent and more intense among BC physicians than it has been in the past, and it details strategies and resources that can help.[3] In addition, a new study shows that physicians may find additional support through working in a patient medical home or as part of a primary care network. The study, published in January 2019 in the *Journal of the American Board of Family Medicine*, found lower rates of burnout reported by primary care physicians who felt that their clinic had a high capacity to assist patients in meeting their social needs.[4] The study also found that physicians working in clinics with "patient-centered medical home" status (US terminology for patient medical home) reported higher capacity to support patients with social determinants of health.[4]

Many initiatives are currently underway in BC through the implementation of patient medical homes and primary care networks that connect GPs to a supportive network of other physicians and allied health providers, enabling them to better support patients with social issues. Below are a few examples of work that has already resulted in physician feedback on reduction of burnout.

As primary care network implementation work continues around the province, the GPSC looks forward to gathering more information about the impact teams can have on reducing physician burnout.

Fraser Northwest Division of Family Practice

Clinical counselor initiative

Fraser Northwest's primary care network enables doctors to refer patients with mild-to-moderate mental health and substance use challenges to timely care and support from local clinical counselors.[5] One family physician has commented that before the service was available she felt she didn't have the supports and skills to help patients with mild-to-moderate mental health issues, so she gave what she could—her time. She found herself advocating for her patients, including completing their insurance and disability paperwork on evenings and weekends, and was soon experiencing symptoms of burnout. With the counseling referral system in place, the doctor feels that she isn't left to help patients alone—a significant step in alleviating the feelings of burnout she was experiencing.[5]

Nurse in practice initiative

Fraser Northwest's primary care network has also placed several RNs in physician practices in the region, enabling physicians to better support vulnerable patients and connect them with resources and services in the community. One physician has described feeling burned out and overwhelmed trying to connect patients with local services and help them access the community support they need. His nurse in practice has helped significantly—in one case, a pregnant patient with bipolar disorder needed support and the nurse was able to spend significant time with her, ensuring she had access to resources and community services to support her through her pregnancy. This support put the physician's mind at ease and allowed him to focus on providing pregnancy care for the patient.[6]

Rural and remote: Gabriola Island

Gabriola Community Health Centre patient medical home model

The patient medical home team-based care model at the Gabriola Community Health Centre enables clinic GPs to work closely with a mental health nurse, social worker, occupational therapist, long-term care case manager, and visiting psychiatrist. According to one clinic doctor, the team environment has reduced feelings of burnout for the clinic's GPs—she praises the team for alleviating pressure on her role, and for helping her realize she doesn't have to be the whole support system for her patients.[7]

As primary care network implementation work continues around the province, the GPSC looks forward to gathering more information about the impact teams can have on reducing physician burnout, and ensuring doctors are

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

Doctors of BC is developing a policy paper to address the mounting and competing demands that contribute to physician burden. Member engagement to inform this project was conducted earlier this year. Key findings are summarized in the *What We Heard* report (page 1 shown at right) and available for download at www.doctorsofbc.ca/sites/default/files/docsbc_what_we_heard_v2_1.pdf. Release of the policy paper is anticipated in spring 2020.

freed up to do the work that brought them to the medical profession in the first place—the work they love to do.

To learn more about patient medical homes, primary care networks, and team-based care, visit www.gpscbc.ca. ■

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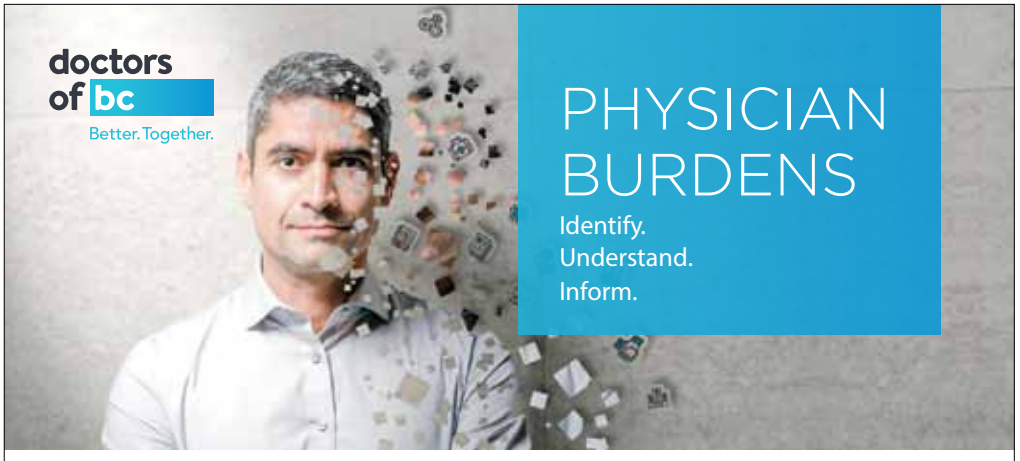
References

1. CMA. Statement on physician health and wellness. Guiding principles. Accessed 13 September 2019. www.cma.ca/sites/default/files/2018-11/physician-health-wellness-statement-e.pdf.
2. Institute for Healthcare Improvement. IHI Triple Aim initiative. Accessed 13 September 2019. www.ihi.org/Engage/Initiatives/TripleAim/Pages/default.aspx.
3. Physician Health Program. Physician stress and burnout: Understanding, preventing, relieving. Accessed 4 October 2019. www.physicianhealth.com/sites/default/files/files/PhysicianStressandBurnoutPolicy.pdf.
4. De Marchis E, Knox M, Hessler D, et al. Physician burnout and higher clinic capacity to address patients' social needs. J Am Board Fam Med 2019;32:69-78.
5. Divisions of Family Practice. News and notes. FNW clinical counselling initiative: Reducing physician burnout and improving access to care. Accessed 4 October 2019. https://divisionsbc.ca/provincial/news-and-events/news-and-notes/fnw-clinical-counselling-initiative-reducing-physician.
6. Divisions of Family Practice. News and Notes. RNs in practice: Supporting vulnerable patients in Fraser Northwest. Accessed 4 October 2019. https://divisionsbc.ca/provincial/news-and-events/news-and-notes/rns-practice-supporting-vulnerable-patients-fraser.
7. Divisions of Family Practice. News and notes. Team-based care: The best thing about practising on Gabriola Island. Accessed 16 September 2019. https://divisionsbc.ca/provincial/news-and-events/news-and-notes/team-based-care-best-thing-about-practising-gabriola.



WHAT WE HEARD

What was the goal of this member engagement?

We know physicians are frustrated by mounting demands. For many, the volume and pace of these demands have become burdensome, which can have serious consequences for physicians and the health care system. A dedicated, long-term approach that focuses on systemic change is needed.

We wanted to understand if and how mounting demands impact BC physicians so that Doctors of BC can advocate for policy solutions that reflect your experience and meet your needs.

How did we seek member input?

Representative Assembly
18 small-group discussions with 100+ members to confirm and refine literature review findings on identified burden areas and inform outreach to all members.

All-member engagement
Interactive online engagement with members to understand if and how these burden areas impact you.

Who participated?

631 registered members

GP or Specialist	Practice setting	Geographic setting
GP/Family physician: 59%	Community-based: 36%	Urban: 63%
Specialist: 39%	Facility-based: 23%	Semi-urban: 17%
Other: 2%	Both: 41%	Rural: 20%

What did we ask?

Our online engagement had three sections for members to provide their input using 3 tools:

A comment board to identify the specific demands that are burdening your practice

Survey questions to understand the impacts of the burden areas

An ideas board to inform our solutions

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.

Preventing and responding to violence against physicians

To help physicians better prepare and to mitigate violence against them, Doctors of BC has developed a guide with information and resources that includes what to do before, during, and after a violent incident; who to reach out to; and how to assess the situation. Visit www.doctorsofbc.ca/sites/default/files/violencepreventionguideforcommunityoffices.pdf to review and download the guide.

Online resources for surgical patient optimization

A new Specialist Services Committee web page of over 50 resources is available for patients and caregivers to better optimize surgical patients' health before surgery for improved outcomes. Resources have also been put together in a booklet, *Surgical Patient Optimization Collaborative (SPOC) Change Package*, which is available in hard copy and online. Visit http://sscbc.ca/programs-and-initiatives/improve/surgical-patient-optimization-collaborative-spoc/optimization to access the Optimization Resources web page.

How common are mental health problems in arthritis patients?

A recent Arthritis Research Canada study revealed that while administrative health databases are increasingly being used to study mental health in rheumatic diseases, researchers have used different ways to identify patients who have depression and anxiety, making it challenging to draw conclusions and comparisons across publications.

Administrative health databases refer to secondary data collected for billing purposes, which may comprise several unique administrative data sources, such as those capturing inpatient visits, outpatient visits, and prescription claims. These databases are increasingly used to study depression and anxiety in rheumatic diseases, but they only record details of those who seek and receive treatment. And mental health problems are notoriously underreported.

While there are many physical complications associated with rheumatic diseases, there is also an increased risk of depression and anxiety. A recent Canadian population-based study reported that individuals with rheumatoid arthritis have a 1.5-fold increased risk for incident depression and a 1.2-fold increased risk for incident anxiety.

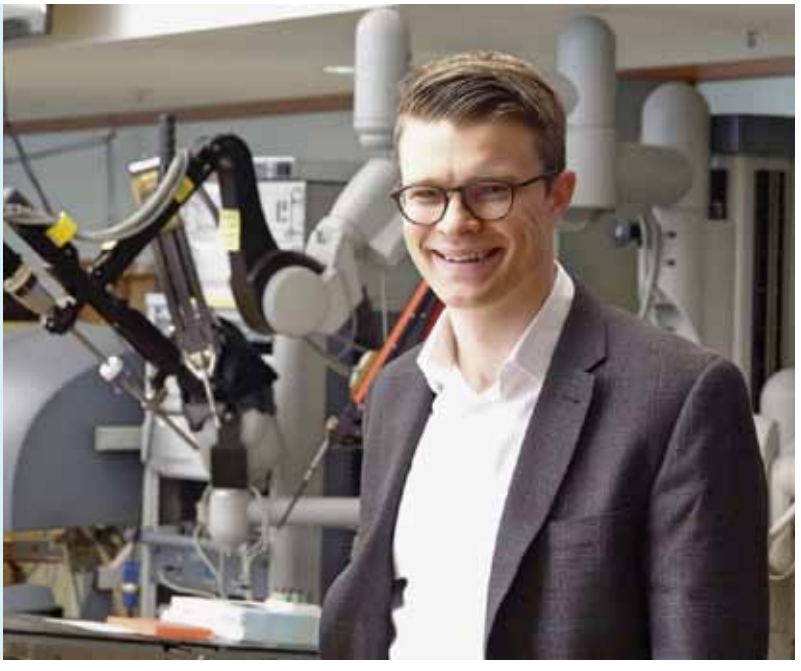
While administrative health data are very accessible and reduce common biases associated with hospital- and clinic-based studies, there are many challenges associated with relying on the data to identify depression and anxiety. This research is a first step for researchers at Arthritis Research Canada toward understanding mental health issues in individuals living with arthritis using administrative health data.

To read the abstract of this paper in *Arthritis Care & Research*, visit https://onlinelibrary.wiley.com/doi/10.1002/acr.24048. To access a

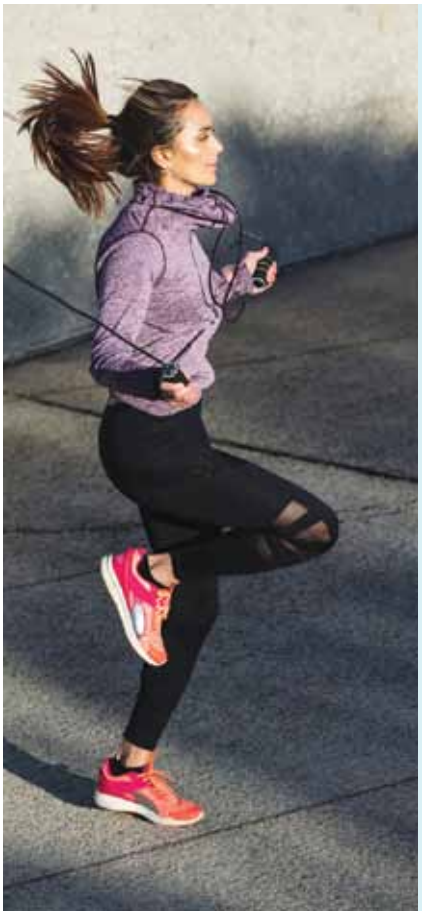
UBC med student wins Innovation grant

Mr Philip Edgcumbe, a UBC medical student, has won a Joule Innovation grant in the Emerging Physician Innovator category. The category supports medical learners and residents who are looking to increase or improve access to care or create health care solutions that will provide better outcomes for patients. Mr Edgcumbe invented a miniature projector for surgery, called the Pico Lantern. A $5000 grant will allow him to further develop and test the prototype for his device, which is small enough to be dropped into the abdominal cavity, giving surgeons the ability to peer beneath the surface, better formulate their surgical plans, and minimize surgical complications.

Joule, a subsidiary of the CMA, selected eight recipients for its annual Innovation grants. The recipients come from across Canada and will share $200 000 in flexible funding to develop or expand their projects. For more information on the grant program and this year's recipients, visit www.joulecma.ca/grants.



Mr Philip Edgcumbe invented a miniature projector for surgery, called the Pico Lantern.



Taking evolution to heart

An international research group at UBC, Harvard University, and Cardiff Metropolitan University has discovered how the human heart has adapted to support endurance physical activities. The research examines how the human heart has evolved and how it adapts in response to different physical challenges, and will bring new ammunition to the international effort to reduce hypertensive heart disease.

The study analyzed 160 humans, 43 chimpanzees, and 5 gorillas to gain an understanding of how the heart responds to different types of physical activity. In collaboration with Harvard University's Daniel Lieberman and Aaron Baggish, UBC professor Robert Shave and colleagues compared left ventricle structure and function in chimpanzees and a variety of people, including some who were sedentary but disease-free, highly active Native American subsistence farmers, resistance-trained football linemen, and endurance-trained long-distance runners.

The wide variety of participants were specifically recruited in order to examine cardiac function in an evolutionary context. From the athletic stadium to wildlife sanctuaries in Africa, the team measured a diverse array of cardiac characteristics and responses to determine how habitual physical activity patterns, or a lack of activity, influence cardiac structure and function. Guiding their inquiry is the well-known idea that the heart remodels itself in response to different physiological challenges.

Among humans, the research team showed there is a trade-off between these two types of adaptations. This trade-off means that people who have adapted to pressure cannot cope as well with volume and vice versa. Basically, the hearts of endurance runners aren't great at dealing with a pressure challenge, and the weight lifter's heart doesn't respond well to increases in volume.

This new research provides evidence that the human heart evolved for the purpose of moderate-intensity endurance activities, but adapts to different physical (in)activity patterns. This research was published in the *Proceedings of the National Academy of Sciences* journal: https://www.pnas.org/content/116/40/19905.

full copy of the paper, contact Mary De Vera, research scientist of pharmacoepidemiology, MSc, PhD, at mdevera@arthritisresearch.ca.

Canada leading developed countries in survival for lung and colon cancer

Canada has among the highest survival rates for lung cancer and colon cancer compared to other developed countries, according to new data published in *The Lancet Oncology*. Data were gathered by the International Cancer Benchmarking Partnership (ICBP) and are the most recent collection of survival statistics for seven types of cancer in seven countries: Canada, Australia, Denmark, Ireland, New Zealand, Norway, and the United Kingdom. There were 3.9 million cancer cases collected from cancer registries in 21 jurisdictions across the participating countries since 1995, including over 762 000 Canadian cancer cases from eight provinces.

The data show that Canada is among the world leaders in survival for most of the seven cancers observed, except for esophageal cancer and ovarian cancer. While Canada's overall average survival generally compares well, there is often more variation among the provinces than across the countries in this study.

The ICBP, led by Cancer Research UK, is an international partnership of clinicians, academics, and policymakers seeking to understand variations in cancer survival between developed countries. The ICBP funds and produces high-impact, peer-reviewed publications showing international cancer survival variation and differences in awareness and beliefs about cancer and the role of primary care in cancer diagnosis. To learn more about what data are available, contact the ICBP Programme

Management team at icbp@cancer.org.uk.

The Canadian Partnership Against Cancer (CPAC) participates in the international study through chairing the program board and funding the collection and analysis of all contributing provinces' data from their cancer registries for the ICBP paper. Read the full report at www.thelancet.com/journals/lanonc/article/PIIS1470-2045(19)30456-5/fulltext.

This past June, the CPAC released the modernized *Canadian Strategy for Cancer Control*, a roadmap to deliver world-class cancer care to all Canadians, families, and caregivers affected by the disease. The *Strategy* and its action plans acknowledge this variation in survival rates across Canada and strive to promote equity of access to quality cancer care for all Canadians. The *Strategy* also details the actions necessary to improve equity of care and ensure we have a sustainable health care system for the future. The CPAC is engaging with leading countries from the ICBP report, such as Australia, to learn more about their models of care and adapting approaches for Canada.

As the steward of the *Canadian Strategy for Cancer Control*, the CPAC works with Canada's cancer community to take action to ensure fewer people get cancer, more people survive cancer, and those living with the disease have a better quality of life. This work is guided by the *Strategy*, which was refreshed for 2019 to 2029 and will help drive measurable change for all Canadians affected by cancer. The *Strategy* includes five priorities that will tackle the most pressing challenges in cancer control as well as distinct priorities and actions reflecting Canada's commitment to reconciliation with First Nations, Inuit, and Métis peoples. The CPAC will oversee implementation of the priorities in collaboration with organizations and individuals on the front lines of cancer care—the provinces and territories; health care professionals; people living with cancer and those who care for them; First Nations, Inuit, and Métis communities; governments and organizations; and its funder Health Canada. Learn more about the CPAC and the refreshed *Strategy* at www.cancerstrategy.ca.

Canadians with inflammatory conditions sought for surveys

Two of Canada's leading patient groups, the Gastrointestinal Society and the Canadian Society of Intestinal Research, are calling on patients with inflammatory bowel disease (IBD) to participate in a survey to help identify what's missing in their care. They are also asking Canadian patients with any inflammatory condition who take biologic/biosimilar medication to provide their opinions.

Inflammatory bowel disease

The first survey, IBD Patients: What's Missing in Your Care?, seeks to learn more about IBD patients' experiences and their outlook in current management. The survey, available in English and French, follows a similar questionnaire conducted in 2018, but this time is open to IBD patients worldwide in order to collect a larger and more diverse body of information about the IBD patient community. Participants must have been diagnosed with any type of IBD (Crohn disease, ulcerative colitis, ulcerative proctitis, microscopic colitis, etc.). Visit https://badgut.org/ibd-survey-2019 to learn more and participate in the study.

Use of biologic/biosimilar medications for inflammatory diseases

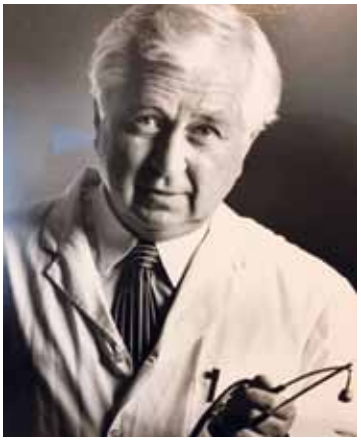
The second survey, the Canadian Biosimilar Medication Experience, explores the experiences and outlook of Canadian patients who use biologic/biosimilar medications to treat inflammatory bowel disease (Crohn disease or ulcerative colitis), as well as other inflammation-causing diseases such as diabetes, rheumatoid arthritis, cancer, osteoporosis, psoriasis, HIV, multiple sclerosis, or growth deficiencies. This survey follows up on one conducted in 2015. Visit https://badgut.org/biosimilars-survey-2019 to learn more and participate in the study.

Data gathered from both surveys will be used anonymously and in aggregate to shape future programming and to inform discussions with community members, health care professionals, and health policy decision-makers.

For more information about the Gastrointestinal Society and the Canadian Society of Intestinal Research visit www.badgut.org.

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 Dennis Myron Karpiak
1943–2019

Dr Dennis Karpiak passed away in the ICU of Royal Inland Hospital in Kamloops, BC, on 23 February 2019 at the age of 75. It was ironic, but perhaps fitting, that he would pass away in the hospital where he had practised critical care medicine, respirology, and general internal medicine for over 30 years.

Dennis was born in Dauphin, Manitoba, but grew up in Oshawa, Ontario. As a high school graduate he distinguished himself academically, receiving an Ontario Scholar award. It was probably in Oshawa where he also developed his of love of cars. While in university he had summer employment at the GM plant. He bought his first Corvette while in university, and took a course in high-speed driving at Ontario's Motorsport racetrack. During his last week in hospital I found him reading the latest *Road and Track* magazine. One of his projects, in his last few years, was restoring a 1965 Corvette convertible, which won the Best of the Best award at a classic car show in Kamloops.

Dennis completed his undergrad and medical school at the University of Toronto, graduating in 1968. He completed his internship and 2 years of general internal medicine at St. Paul's Hospital in Vancouver (1969–1971) followed by 3 years of subspecialty training in critical care and respiratory medicine at the University of Alberta in Edmonton. Upon completion of his training, he was recruited by Royal Inland Hospital to head the cardiopulmonary department.

Over the years Dennis was a fierce advocate for Kamloops. He was instrumental in the establishment of a respiratory technology program at Thompson Rivers University, which continues to supply respiratory therapists to all regions of the province. In recent years he was an active participant in the successful opposition to an open-pit mine on the outskirts of Kamloops.

Dennis was well regarded for his professionalism, and served several terms as a then BCMA Board member for the Kamloops area. He was known for his ready availability and willingness in taking on the care of seriously ill patients. This availability was most appreciated by those referring physicians in surrounding smaller communities. He could be counted on to take charge in a crisis, even in nonmedical situations. Several years ago, at Sun Peaks, a young girl ended up hanging some 25 feet above the ground while mounting a chairlift. Dennis immediately placed himself below the chair in order to break her fall. He suffered a neck injury, which eventually resulted in cervical fusion surgery. He received the Governor General's Medal of Bravery for his prompt response to this emergency.

Dennis seemed to welcome controversy, often taking a contrary point of view, which he could expertly articulate. He loved travel, family, gardening, cars, deep-sea fishing, and telling humorous stories of his experiences (most of which may have had some basis in fact). His dislikes included technology (unless it pertained to cars), doctors making rounds in bicycle shorts, golf, and photo radar. He freely shared his views on these topics. His political viewpoint was definitely to the right of centre.

Dennis leaves behind his wife of 48 years, Robin; his sons Scott and Andrew; their spouses Rebecca and Cassandra; and four grandchildren. Dennis was a larger-than-life presence, both in his professional and personal life, and he will be missed.

—Glenn A. Scheske, MD, FRCP(C)

Dr Ka Wai Angela Chan
1982–2019

On 9 August 2019, the world lost one of its dearest and most beloved physicians. Dr Ka Wai Angela Chan passed away in her sleep from a sudden illness at age 37. She was pregnant with her second child at the time of her passing.

Dr Chan was born in Macao on 17 June 1982. An only child, she immigrated to Canada with her parents at age 14. Dr Chan excelled in her academics and was the top of her class in Gladstone High School.

As her father passed away during her early university years, Dr Chan worked part time to help support her mother financially. She went through pharmacy at University of British Columbia and worked briefly as a pharmacist before deciding to go into medicine. Dr Chan worked part time to put herself through medical school, never complaining about her burdens.

Dr Chan graduated from UBC Medical School in 2012 and completed her residency at the University of Calgary in 2014. She practised full-service family practice in Burnaby's Crystal

Mall starting in July 2015. At a time when many doctors avoided taking on the burden of a family practice, Dr Chan embraced the challenge and took pleasure in taking on the needy and complex care patients. She spoke Mandarin and Cantonese fluently. And those who had the privilege of hearing her sing said she had the voice of an angel.

Dr Chan was well respected and loved by her patients; her care was second to none. She was compassionate and devoted to her profession, touching the lives of many and leaving a deep impression on those for whom she cared. Her patients are brokenhearted and devastated by her absence. Everywhere she went, she left behind fond memories of her kindness and generosity.

Being well liked by all, Dr Chan leaves behind numerous friends and colleagues. She also leaves behind her husband of 2 years, Anderson Lu, her son Augustin Lu, and her mother Lei Ut Tak.

We miss you Angela. You will remain close in our hearts forever. You have left a void in all of us that can never be filled.

—Wayne Niou, MD
Burnaby

—Anderson Lu
Vancouver

Electronic books

Libraries' physical footprints are getting smaller, but their collections are growing virtually. Books have made the transition to electronic formats much more slowly than journals, but e-books now account for a substantial portion of most libraries' collections. Regardless of the format, the value that books hold for clinical purposes must be judged by their currency, the authors' qualifications, attribution to valid evidence, peer review, and transparency of conflicts of interest. Each digital platform may be judged by a variety of criteria, including the utility of its search tools and hyperlinks within the resource, its downloading and printing options, and its updating capabilities.

One barrier to the use of e-books is lack of awareness of their availability. Every BC health authority library has an e-book collection accessible through the library's online catalogue, as does the UBC library for health care providers with faculty appointments, and the College of Physicians and Surgeons of BC Library. College registrants have access to over 600 e-books through the Library's catalogue (http://szasz.cpsbc.ca). Topics cover the full range of medical specialties including anesthesia and analgesia, cardiology and cardiac surgery, dermatology, emergency medicine, surgery, immunology and allergy, internal medicine, pediatrics, psychiatry, obstetrics, and gynecology. Notable for presentation of evidence, authority, and currency are e-books such as *Clinical Handbook of Psychotropic Drugs Online, Clinical Handbook of Psychotropic Drugs for Children and Adolescents Online*, *Color Atlas and Synopsis of Family Medicine* (2019), and *Roberts and Hedges' Clinical Procedures in Emergency Medicine and Acute Care* (2019).

When investigating complex and wide-reaching clinical concerns or highly focused topics, e-books can contextualize and distill information in a conveniently accessible format. Have a look at your local health authority's collections to support your clinical decision making and continuing education. ■

—Karen MacDonell
Director, Library Services

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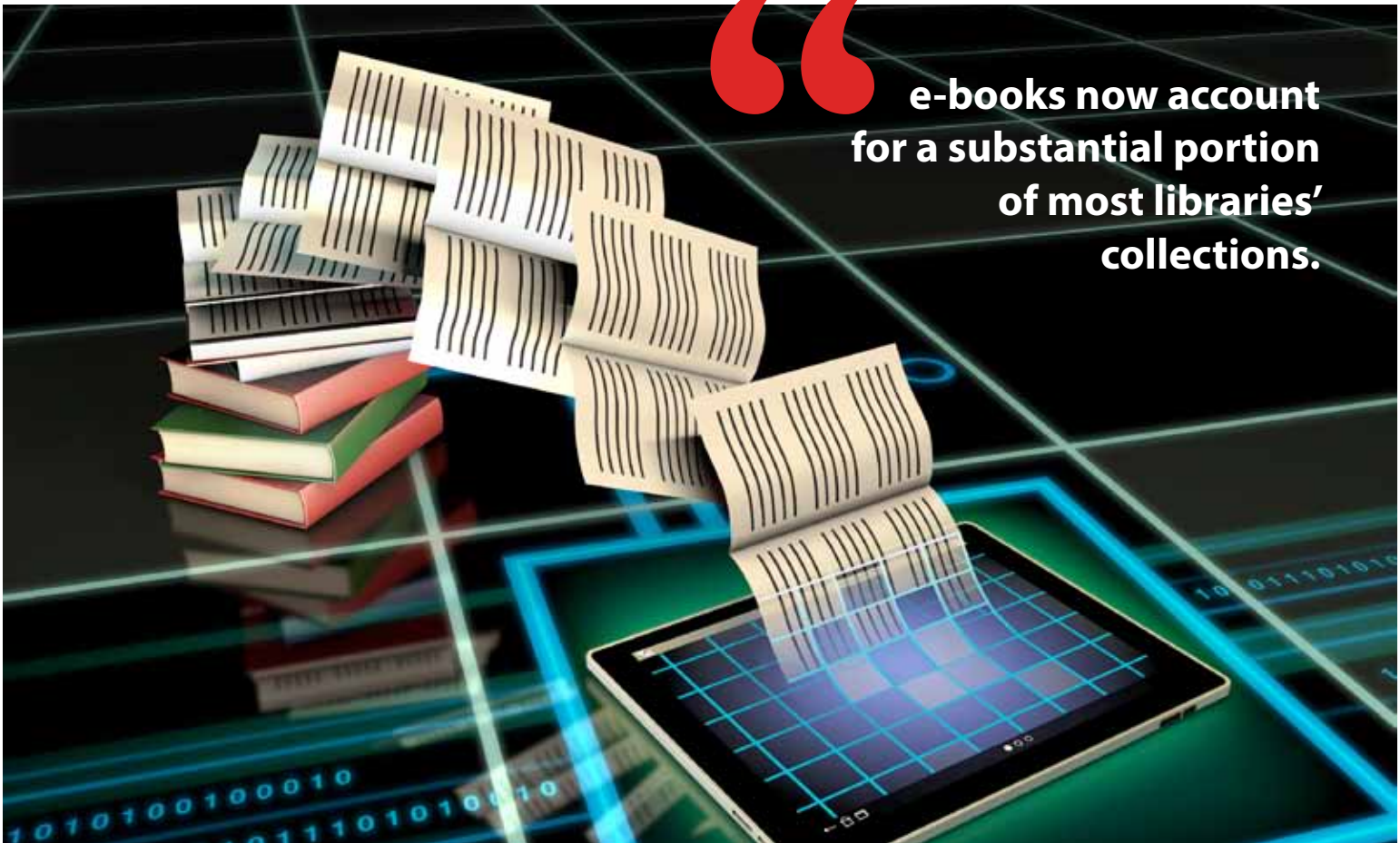

Simple steps to better health

First steps

Since the Neolithic Revolution 12 000 years ago, people have sought to make lasting alterations to the environment to meet their needs. The first stairs were thought to be simply hewn logs or stones placed in sequence to make incremental ascent and descent easier. Since the earliest Mesopotamian cities, stairs have been an integral part of the built environment.

Despite the enormous benefits that stairs provide, there are dangers associated with their use, and current standards of stair design may need to change to optimize user safety.

Burden of disease

The use of stairs presents many muscular and neurological demands that go beyond those required of walking. Perhaps not surprisingly, accidents while using stairs represent a significant portion of accidental trauma.[1] The burden of injury is disproportionately borne by the elderly and by those with certain medical conditions.[2]

In persons over 65, falls rank first among causes of death from injury.[3] Data from 1992 put the cost of falls in the US at $10 billion, with an estimated 20% of these attributable to stair use.[2,3] These figures may underestimate the burden of stairway injury. Falls while using stairs are often more dangerous than those sustained while walking, particularly with respect to the risk of traumatic brain injury or hip fracture.[2]

Accidents while using stairs represent a significant portion of accidental trauma.

Risky behavior

There are several high-risk behaviors that contribute to falling on stairs—leaving objects on the steps, wearing high-heeled shoes, being distracted, carrying heavy loads, and not using the handrail.[2]

Physics of stair design

Various standards have emerged in stair design that prescribe how high (the rise) and how deep (the run) stairs must be **[Figure]**.[4] The position and contour of the handrail is often regulated, as are tolerances for the consistency of stair height. In the UK, for example, private dwellings are permitted to have a stair pitch of 42 degrees. In the US, tread depth can be as low as 9 inches in some jurisdictions.

These details are important. A body of biomechanical research has detailed the mounting challenge posed by stairs of increased height and diminished depth.[3] For example, Novak and colleagues suggest that a person's stability on stairs is best when the depth of the tread is at least 13 inches and the pitch is 28 degrees.[5] Other authors have focused on visual cues, such as high-contrast edging, which is associated with increased foot clearance (and is presumed to reduce the risk of tripping).[6,7] The evidence that deeper treads and lower rises would reduce the risk of injury is consistent with a call to revise standard stair dimensions to more of a low-riser configuration. Such configurations, however, are understandably more expensive because a larger horizontal footprint is required for the same height gained.

The literature so far tends to rely on proxy measures from biomechanical studies to imply risk reduction. There remains a role for intervention studies to demonstrate a clearer link between low-rise stair design and improvements in morbidity and mortality.[3]

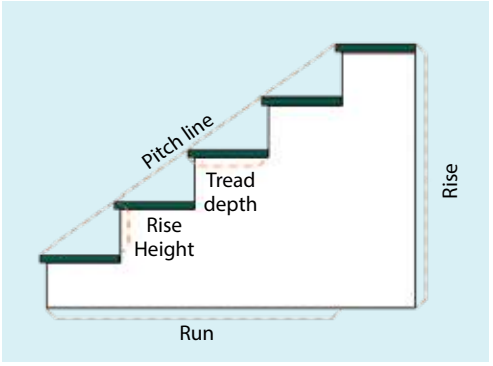

FIGURE. The basics of stair terminology.[4]
Source: Wikipedia

Making stairs safer

In many cases, the risk of stairway falls can be reduced by addressing an individual's strength and balance issues. Wearing corrective lenses and appropriate footwear are simple fixes.

Avoiding the risky behaviors listed above, coupled with use of proper lighting, a handrail, and high-contrast edging, are also inexpensive ways to reduce the risk of falls.

Should building codes be revised to make stairs less steep? More research is needed before taking that last step. ■

—Lloyd Oppel, MD

This article is the opinion of the Environmental Health 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.*

References

1. Startzell JK, Owens DA, Mulfinger LM, Cavanagh PR. Stair negotiation in older people: A review. J Am Geriatr Soc 2000;48:567-580.
2. Jacobs JV. A review of stairway falls and stair negotiation: Lessons learned and future needs to reduce injury. Gait Posture 2016;49:159-167.
3. Sattin RW. Falls among older persons: A public health perspective. Annu Rev Public Health 1992;13:489-508.
4. Wikipedia. Stairs. Accessed 10 September 2019. https://en.m.wikipedia.org/wiki/Stairs.
5. Novak AC, Komisar V, Maki BE, Fernie GR. Age-related differences in dynamic balance control during stair descent and effect of varying step geometry. Appl Ergon 2016;52:275-284.
6. Zietz D, Johannsen L, Hollands M. Stepping characteristics and centre of mass control during stair descent: Effects of age, fall risk and visual factors. Gait Posture 2011;34:279-284.
7. Foster RJ, Hotchkiss J, Buckley JG, Elliott DB. Safety on stairs: Influence of a tread edge highlighter and its position. Exp Gerontol 2014;55:152-158.

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.

CME ON THE RUN

VGH and various videoconference locations, 22 Nov–5 Jun (Fri)

CME on the Run sessions are held at the Paetzold Lecture Theatre, Vancouver General Hospital and there are opportunities to participate via videoconference from various hospital sites. Each program runs on Friday afternoons from 1 p.m. to 5 p.m. and includes great speakers and learning materials. Dates and topics: 22 Nov (dermatology and allergy). Topics include: Hair loss and thinning in middle age; Chronic leg ulcers: The best office approach; Psoriasis: Multimodal treatment—topical and beyond; "Is this lesion cancer?": What's new, what not to miss; Rosacea: What's old, what's new, and what's best?; Acne: A stepwise approach for office practice; Early allergen exposure: Can we reduce incidence of food and environmental allergies?; Do they really have a penicillin allergy? The office challenge. The next sessions are: 31 Jan (psychiatry); 3 Apr (infectious disease and travel); 1 May (prenatal, pediatric, and adolescents); 5 Jun (internal medicine). To register and for more information visit ubccpd.ca, call 604 675-3777; or email cpd.info@ubc.ca.

GP IN ONCOLOGY CASE STUDY DAY & FAMILY PRACTICE ONCOLOGY CME DAY

Vancouver, 22–23 Nov (Fri–Sat)

BC Cancer's Family Practice Oncology Network is presenting two practice-ready CME events for family physicians at BC Cancer's Annual Summit, 22–23 November, at the Sheraton Vancouver Wall Centre. 22 Nov: GPO (General Practitioner in Oncology) Case Study Day, and 23 Nov: Family Practice Oncology CME Day. GPO Case Study Day (up to 5.5 Mainpro+ credits) provides in-depth exploration of prevalent and emerging challenges in cancer care through case-based discussion, while Family Practice Oncology CME Day (up to 5.75 Mainpro+ credits) provides insight into new developments and practice changing guidelines in cancer care. Both offer opportunity to build helpful cancer care connections. Full details at fpon.ca or via dilraj.mahil@bccancer.bc.ca.

MINDFULNESS IN MEDICINE WORKSHOPS AND RETREATS

Various locations, 29 Nov–24 May

Join Dr Mark Sherman and your community of colleagues for a transformative workshop or retreat! Foundations of Theory and Practice Workshop for Health Professionals, 29 Nov–1 Dec, Kingfisher Resort, Royston, and A Physician Meditation Retreat, 24–29 May, Hollyhock, Cortes Island. Physician Heal Thyself workshops focus on the theory and practice of mindfulness and meditation—reviewing definitions, clinical evidence, and neuroscience, and introducing key practices of self-compassion, breath work, and sitting meditation to nurture resilience and healing. This annual meditation retreat is an opportunity to delve deeply into meditation practice in order to recharge, heal, and build a practice for life. Each workshop is accredited for 16 Mainpro+ group learning credits and has a 30-person limit, so please register today! Contact us at hello@livingthismoment.ca, or check out www.livingthismoment.ca/event for more information.

GP IN ONCOLOGY TRAINING

Vancouver, 3–14 Feb (Mon–Fri)

The BC Cancer's Family Practice Oncology Network offers an 8-week General Practitioner in Oncology training program beginning with a 2-week introductory session every spring and fall at the Vancouver Centre. This program provides an opportunity for rural family physicians, with the support of their community, to strengthen their oncology skills so that they may provide enhanced care for local cancer patients and their families. Following the introductory session, participants complete a further 30 days of customized clinic experience at the cancer centre where their patients are referred. These can be scheduled flexibly over 6 months. Participants who complete the program are eligible for credits from the College of Family Physicians of Canada. Those who are REAP-eligible receive a stipend and expense coverage through UBC's Enhanced Skills Program. For more information or to apply, visit www.fpon.ca, or contact Jennifer Wolfe at 604 219-9579.

BCCDC

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References

1. Joint Task Force on Practice Parameters; American Academy of Allergy, Asthma and Immunology; Joint Council of Allergy, Asthma and Immunology. Drug allergy: An updated practice parameter. Ann Allergy Asthma Immunol 2010;105:259-273.
2. Macy E, Ngor EW. Safely diagnosing clinically significant penicillin allergy using only penicilloyl-poly-lysine, penicillin, and oral amoxicillin. J Allergy Clin Immunol Pract 2013;1:258-263.
3. Abrams EM, Atkinson AR, Wong T, Ben-Shoshan M. The importance of delabeling β-lactam allergy in children. J Pediatr 2019;204:291-297.
4. Blanca M, Torres MJ, Garcia JJ, et al. Natural evolution of skin test sensitivity in patients allergic to beta-lactam antibiotics. J Allergy Clin Immunol 1999;103:918-924.

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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.

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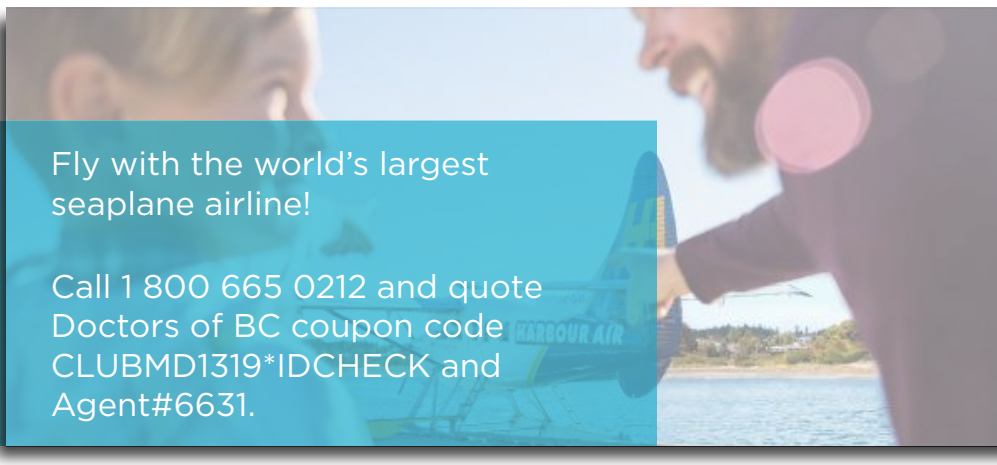

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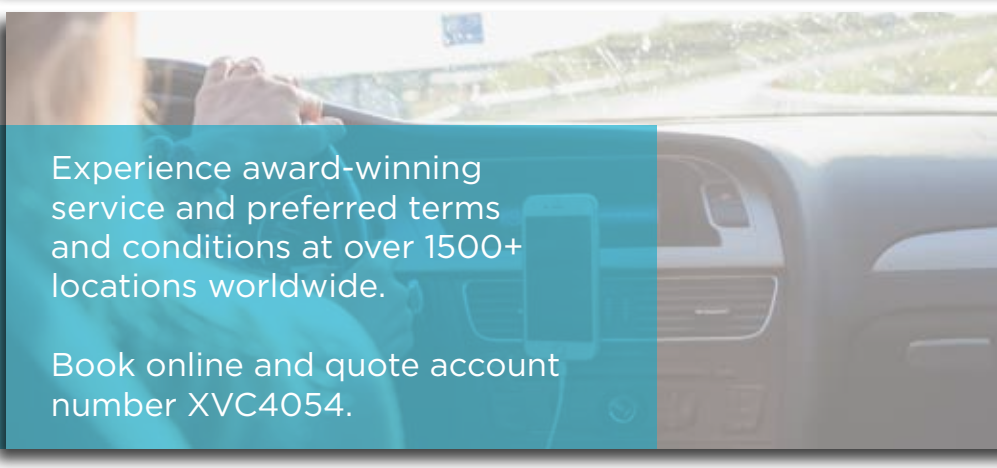

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