

The challenges of measuring blood pressure during COVID-19

How to integrate and support home blood pressure measurements

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Coronavirus disease 2019 (COVID-19) has altered the availability of face-to-face care in family practice. The negative effect on routine care for chronic disease management is an ongoing challenge. The purpose of this article is to describe some of those challenges and to suggest solutions.

High blood pressure (BP) is one of the leading and most persistent risks of disability and premature death in Canada and worldwide.¹ According to the Global Burden of Disease study, elevated systolic BP was associated with the highest burden among risk factors for both men and women in 2015, resulting in 10.7 million deaths and 211.8 million disability-adjusted life years.² In Canada, 7.5 million people are living with hypertension.³ In 2010, hypertension cost the Canadian health care system more than \$13.9 billion (direct and indirect health care costs), and it was estimated that costs would double by 2020 if comprehensive and concerted countermeasures were not put in place.⁴

Hypertension is typically diagnosed and managed in the primary care setting and it is one of the most common reasons for patients to visit family physicians in Canada.⁵ Accurate BP measurement is necessary to optimally screen, diagnose, and treat hypertension. In a time of COVID-19, with restricted physical access to patients, there is uncertainty about how family physicians are measuring BP and assessing cardiovascular risk.⁶ In order to assist family physicians with these issues, we conducted an online survey designed to assess changes in BP measurement during COVID-19 and to identify solutions to barriers of assessment in patients with restricted access to in-person care. The survey was distributed through 16 divisions of family practice in British Columbia between June 1, 2020, and August 8, 2020. Responses were received from 56 family physicians.

After March 15, 2020, physicians reported a change in how they assessed patients with hypertension. Before March 15, 18.0% of visits were by telephone, 12.6% by videoconference, 2.6% by e-mail, and 13.7% through the electronic medical record patient portal. After March 15, the proportions were 80.7%, 36.7%, 6.2%, and 1.8%, respectively.

Since COVID-19 restrictions were put into place, there has been a substantial reduction in the ability to assess end organ damage and cardiovascular risk. More than 80% of respondents reported serious reductions in use of manual, automated, and pharmacy BP measurements;


in contrast, 64% reported increases in the use of home BP measurement.

While home BP measurement is being used more frequently during COVID-19, many concerns and potential solutions have been identified. The first and biggest concern is the validity and reliability of home BP readings. This includes whether the devices used at home are validated and properly calibrated, and whether the patients are following proper measurement techniques. Strategies and solutions have been suggested, including distributing handouts on proper BP measurement techniques, calibrating home BP monitors against office-based sphygmomanometers, and asking patients to demonstrate (in person or virtually) how they measure their BP. Also, these concerns can be addressed by directing patients to the Hypertension Canada website. The site provides a list of BP devices validated for home use (<https://hypertension.ca/hypertension-and-you/managing-hypertension/measuring-blood-pressure/devices2/>) and detailed instructions on how to measure BP at home (<https://hypertension.ca/hypertension-and-you/managing-hypertension/measuring-blood-pressure/>).

The second concern is a lack of access to BP devices for some patients. Before the pandemic, many patients relied on physician offices or pharmacies to measure BP to guide diagnosis and management. However, they are now no longer able to use them, either because access is restricted, or because they are reluctant to go to pharmacies or offices. This lack of BP measurement either at home, in offices, or in pharmacies puts this population at increased risk of underdiagnosis of hypertension, poor control of BP, and potential for overuse or underuse of antihypertensive medications. One solution is to encourage patients to purchase a home BP monitor, but this might widen inequalities in access to care. While almost half of Canadians with hypertension in 2009 reported monitoring their BP at home,⁷ there are concerns that purchasing a home BP device is a considerable barrier for patients. One potential solution is to establish a pool of monitors at each practice that can be loaned to patients,⁸ but during COVID-19 this process of maintaining supplies, cleaning equipment, and retrieving monitors from patients poses challenges. The simplest solution is to use targeted COVID-19 health provincial funding to pay for home monitors as part of public health's response to the pandemic.

The third concern is about the optimal strategy of sharing home BP readings with family physicians. Patients reported home BP results to their physicians using different methods: telephone (60.0%), fax (8.6%), and e-mail (28.6%). Some patients showed the results during a videoconference, and some dropped off a written list of readings. Some of the proposed solutions include using the Hypertension Canada home BP log,⁹ using a secure e-mail address dedicated to BP reporting, or creating a secure Web-based worksheet using tools such as Google Forms.

The last concern expressed by survey participants was a reduction in the ability to conduct physical examinations (87.6% agreed this was a concern) and laboratory tests (47.6%) to assess end organ damage and cardiovascular risk (50%). Some patients might avoid or delay seeking care because of their concerns for contracting COVID-19 and that the ability to diagnose new patients and monitor patients with hypertension safely has been compromised.

As this pandemic is likely to affect clinical practice for a prolonged period of time, it is imperative that physicians and patients are still able to obtain accurate BP readings. This should be a multifaceted approach encouraging patients to use validated home BP devices, monitor BP using 7-day home BP measurement diaries with appropriate measurement, and attend in-person office visits if needed for BP measurements. 

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Competing interests

None declared

References

1. Chockalingam A, Campbell NR, Fodor JG. Worldwide epidemic of hypertension. *Can J Cardiol* 2006;22(7):553-5.
2. GBD 2015 Risk Factors Collaborators. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet* 2016;388(10053):1659-724. Erratum in: *Lancet* 2017;389(10064):e1.
3. Robitaille C, Dai S, Waters C, Loukine L, Bancej C, Quach S, et al. Diagnosed hypertension in Canada: incidence, prevalence and associated mortality. *CMAJ* 2012;184(1):E49-56. Epub 2011 Nov 21.
4. Weaver CG, Clement FM, Campbell NR, James MT, Klarenbach SW, Hemmelgarn BR, et al. Healthcare costs attributable to hypertension: Canadian population-based cohort study. *Hypertension* 2015;66(3):502-8. Epub 2015 Jul 13.
5. Finley CR, Chan DS, Garrison S, Korownyk CS, Kolber MR, Campbell S, et al. What are the most common conditions in primary care? Systematic review. *Can Fam Physician* 2018;64:832-40.
6. Chudasama YV, Gillies CL, Zaccardi F, Coles B, Davies MJ, Seidu S, et al. Impact of COVID-19 on routine care for chronic diseases: a global survey of views from health-care professionals. *Diabetes Metab Syndr* 2020;14(5):965-7. Epub 2020 Jun 23.
7. Bancej CM, Campbell N, McKay DW, Nichol M, Walker RL, Kaczorowski J. Home blood pressure monitoring among Canadian adults with hypertension: results from the 2009 Survey on Living with Chronic Diseases in Canada. *Can J Cardiol* 2010;26(5):e152-7.
8. British Hypertension Society. *Implementing home blood pressure monitoring in your practice: a practical guide*. Edinburgh, UK: British Hypertension Society; 2020. Available from: https://bihsoc.org/wp-content/uploads/2017/09/Implementing_home_blood_pressure_monitoring_in_your_practice_-_a_practical_guide.pdf. Accessed 2021 Jan 8.
9. Hypertension Canada. *Home blood pressure log*. Markham, ON: Hypertension Canada; 2020. Available from: https://hypertension.ca/wp-content/uploads/2017/11/HTC_BloodPressureLog_ENG_PREVIEW-1.pdf. Accessed 2021 Jan 8.

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