



Editorial

The Indirect Impact of COVID-19 on Cardiac Care and Outcomes: Lessons From a Stretched System

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See article by Tam et al., pages 1547–1554 of this issue.

Waiting lists for procedures are an accepted and even necessary part of the Canadian universal health care system, as in many other public health care jurisdictions, and have received significant public, government, and research attention. Provinces routinely monitor and publish waiting times for cardiac care, and individual programs strive to meet and even surpass wait-time benchmarks. Typically, death or upgrades on a waiting list occur early. Principles of wait-list management include the use of scoring systems for triage (which are useful but do not eliminate the risk of mortality) and specific measures for patients with symptomatic aortic-valve stenosis, who have a higher risk of death on a waiting list than those waiting for isolated coronary artery bypass graft (CABG) procedures.^{1–3} The system—with failsafes for aortic valve disease—has been adherent to these principles, and it works. Or does it?

COVID-19 has dominated the health care system for the last 18 months, through 3 significant waves that have put our hospitals and health care providers under considerable strain. In some jurisdictions, including Ontario, directives from Chief Medical Officers of Health halted nonemergent and nonurgent procedures and surgeries completely for periods of time. One might expect then, that waiting lists—and subsequent outcomes—may have suffered as a result.

In this issue of the *Canadian Journal of Cardiology*, Tam and colleagues linked the Ontario CorHealth Registry to provincial administrative data to determine changes in numbers of patients referred for cardiac procedures, actual numbers of procedures performed, and mortality and hospitalization rates for those on the waiting list. They focused on percutaneous coronary intervention (PCI), CABG, valve surgery, and transcatheter aortic valve replacement (TAVR). The COVID-19 cohort (March 15 to September 30, 2020) of 37,718 patients was compared with a cohort of 584,381 patients from 2014 to 2020. Key findings included, not surprisingly, a decrease in both referrals and procedures performed. Furthermore, an

increase in all-cause mortality while on the waiting list was seen for coronary revascularization procedures but not for valve surgery or TAVR. These findings were consistent, regardless of urgency of referral, and occurred despite demonstrated shorter waiting times.⁴

While the absolute waiting list mortality rates for PCI (0.17% prepandemic vs 0.29% during COVID) and CABG (0.59% vs 0.64%) were small, the relative risk is high, with adjusted hazard ratios of 1.83 (95% confidence interval [CI], 1.47–2.27) and 1.96 (95% CI, 1.28–3.01) for PCI and CABG, respectively. The authors have suggested that patient factors (particularly COVID-19 avoidance behaviour) and system factors (access to specialists and delays in diagnostic testing that led to the revascularization referral, as well as COVID-19–related bed and staffing pressures) may have been responsible for progression of disease or higher-acuity presentations. There may have been more or less of these suggested system variances in different programs; that information is not available, but we must acknowledge the relationship between variance and outcome that can be addressed at local and provincial levels.

One important point has not been stressed, however. The system should not be dependent on patient self-reporting for reprioritization on a waiting list. Some patients recognize their symptoms are worsening but are worried about their income if they have to take a leave of absence from work. They may be reluctant to seek care in a health care setting because of fears of contracting COVID-19. There may be ethnocultural or language barriers that impair nuanced changes in symptom status from being recognized by health professionals. Given that the disease processes under consideration here often present with vague and nonspecific symptoms, additional barriers thrown at us by the pandemic serve to further undermine timely access to care.

When patients wait in hospitals, subjective symptoms and an exclusive dependence on self-reporting gives way to continuous monitoring and evaluation by experienced health care teams, allowing deterioration to be detected in a timelier way. The system can then try to flex to deal with this deterioration by altering case priority: “bumping” other cases, for example.

When patients are waiting at home, however, nobody is watching. Some programs have coordinators who can react to symptom reporting; similarly, referring practitioners can

Received for publication May 22, 2021. Accepted June 3, 2021.

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See page 1503 for disclosure information.

advocate for advancement on a waiting list. This is provided, of course, that patients tell someone when they are not feeling well. There is, therefore, a need to identify early warning signals of patient deterioration that are independent of personality, COVID-19—avoidance behaviour, and the all of the barriers routinely experienced by patients belonging to equity-seeking groups. Remote automated monitoring with the use of wearable sensors that monitor data such as patient vital signs, electrocardiograms, and other physiological parameters can generate real-time, actionable notifications directly to clinicians.⁵ The use of this technology, which is currently being tested in the management of patients discharged after noncardiac surgery,⁶ may have a unique future role in seamless and timely triage in outpatient wait-list management.

Finally, as Tam and colleagues⁴ point out, the lower absolute number of procedure referrals is troubling. Sadly, some patients are likely represented in the unexpected incremental deaths that have been reported in many jurisdictions.^{7,8} More, however, are asymptomatic or pauci-symptomatic at home, unscreened, and undiagnosed and will present later in the course of their diseases. We need to expect them as we plan for future health care needs. This phenomenon, “The Missing Patient,” must be recognized now by policy makers, decision makers, and health-system funders. If patients are “stuck” upstream in their disease trajectories, undiagnosed (and therefore not on any surgical or procedural waiting list), recovery efforts need to fully reactivate this part of the health care system first (primary care, diagnostic testing, specialist consultation, etc) rather than presume a priori that all recovery investments need to go to relieving the “surgical and procedural backlog.” Indeed, Tam and colleagues have shown that there was no backlog; waiting times were actually shortened for those on the list. The true backlog—the *pinchpoint*—is actually upstream.

Adversity can identify cracks in the system, and Tam and colleagues⁴ have shown that there continues to be room for improvement in cardiac procedural waiting-list management. Adversity, however, also represents an opportunity to rethink delivery of care. Low-value care and unwarranted clinical practice variation must be avoided, and we need better ways to monitor our patients while they are waiting. Patients generally do not mind waiting, as long as they know that they are safe to wait, that the triage is fair and equitable, and that they have not been forgotten. In addition to enhancing quality and safety, improved management of waiting lists will enhance

system capacity and better prepare us to act nimbly—and safely—to the next big challenge.

Funding Sources

No funding has been provided for this article.

Disclosures

The authors have no conflicts of interest to disclose.

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