

GUIDANCE FROM THE CCS COVID-19 RAPID RESPONSE TEAM

Applying Ongoing Learning from the COVID-19 Pandemic Towards Optimal Cardiovascular Care in Canada

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1. Summary

Hospitals and ambulatory facilities significantly reduced cardiac care delivery in response to the first wave of the COVID-19 pandemic. The deferral of elective cardiovascular procedures led to a marked reduction in health care delivery, with a significant impact on optimal cardiovascular care and reported increased cardiovascular morbidity and mortality. Given the demonstrated ability to rapidly create critical care and hospital ward capacity, we advocate a different approach during the second and possible subsequent pandemic waves. Local data and experience should balance the need for an expected rise in demand for health care resources to ensure appropriate COVID-19 surge capacity, with continued delivery of essential

cardiovascular care. Incorporating cardiovascular care leaders into pandemic planning and operations will help health care systems minimize cardiac care delivery disruptions, while maintaining critical care and hospital ward surge capacity and continuing measures to reduce the COVID-19 transmission risk in health care settings. Six recommendations geared towards the main pillars of cardiovascular care are presented.

2. Background: The First Wave

In March 2020, hospitals and ambulatory facilities significantly reduced cardiac care delivery in preparation for a surge of COVID-19 cases and hospitalizations. Procedures, such as non-invasive diagnostic cardiac tests, angiograms, percutaneous coronary interventions (PCI), heart rhythm devices and ablations, and cardiac surgeries, were severely restricted, only being performed on an urgent or emergent basis. The deferral of elective procedures led to a marked reduction in health care delivery, with a resultant significant impact on optimal cardiovascular care across the country. The reduction in activity resulted in large backlogs for both diagnostic and therapeutic cardiac procedures.¹

During the initial surge, critical care capacity was created by health care systems, in anticipation of overwhelming strain on hospitals, such as that experienced in many regions worldwide, including Lombardy, Italy, and New York City, USA. In retrospect, the extra capacity created in Canadian hospitals was largely unused and had the simultaneous effect of significant immediate and long-term impact on other non-COVID-19 patients. International data reported increased cardiovascular morbidity and mortality during the first wave of health care lockdowns.² Emerging Canadian data similarly suggested cardiovascular and stroke morbidity and mortality increased during the first wave of COVID-19.³ Health care systems and teams demonstrated nimbleness and an ability to create emergency operations teams to oversee the creation of rapid and safe care delivery. As COVID-19 case volumes increase, along with the cost of deferred cardiovascular care and its associated morbidity and mortality, such teams are key to balanced preparedness.

3. Proposed Strategy for the Second Wave

As a result of lessons learned during the first COVID-19 wave, we advocate a different approach during the second and subsequent pandemic waves. We suggest an approach informed by local data and experience, which balances the need for an expected rise in demand for health care resources to ensure COVID-19 surge capacity with continued delivery of needed

cardiovascular care. By incorporating cardiovascular care leaders into pandemic planning and operations, health care systems can minimize cardiac care delivery disruptions and possible consequences thereof, such as increased cardiovascular hospitalizations, morbidity and mortality, while maintaining critical care surge capacity. Maintenance of rigorous infection mitigation strategies according to local infection prevention and control guidelines remain essential. Furthermore, it is important to establish cross-coverage and redundant call schedules to ensure continuity of care in cases of health care worker illness and/or required isolation. The following recommendations based on consensus are provided for the key pillars of cardiovascular care.

4. Recommendations

i. Ambulatory Care:

In order to protect the fragile population with cardiovascular disease, a pivot towards hybrid care models with virtual care components, and in some instances remote monitoring, was initiated during the first wave of COVID-19. Coordinated efforts between health systems and cardiovascular leaders created new virtual capacity for those requiring emergency care or in-person management. However, there is significant variability in resources for remote healthcare infrastructure across the country. Governments and health systems should prioritize and invest in enhancing this capacity. High-quality remote ambulatory care can be offered for a great proportion of cardiovascular patients, providing timely access to local laboratories, unencumbered access to guideline-directed medical therapy, and up-to-date information systems.⁴ At the same time, there is a need for a strong message to health care systems, clinicians, and individuals that high risk patients cannot be delayed for in-person evaluation and investigation. This approach is crucial to prevent the unintended consequence of increased morbidity and mortality due to acute presentations of heart failure, acute coronary syndromes, and syncope.

ii. Hospital Inpatient and Critical Care:

Prior to the COVID-19 pandemic, most Canadian centres had both inpatient ward and critical care occupancy rates very near maximal capacity, severely compromising the ability to sustain prolonged and/or large volume surges posed by pandemics. With regard to cardiovascular critical care, some Canadian centres incorporate cardiac surgery patients into medical-surgical critical care units, while others have distinct cardiovascular surgery and cardiac intensive care

areas. In both contexts, surge capacity directly impacts cardiac patient access to critical care. It is recommended that the perioperative team develop a location and process to safely care for cardiac surgery patients in an environment that is able to maintain strict COVID-19 infection mitigation protocols. Cardiology inpatient ward bed capacity may also be significantly impacted by surge capacity aimed at ensuring adequate bed resources for non-critically ill hospitalized COVID-19 patients. Individual health care system decisions regarding inpatient ward and critical care resources should factor in cardiovascular patient acuity and flow. To this end, strategic bed allocation will benefit from cardiovascular leader participation during pandemic logistical planning.

iii. **Procedural Care:**

The majority of needed procedural care can continue without impact on the necessary in-hospital bed capacity that may be required for a potential COVID-19 surge. Redeployment of health care workers may impact the ability to perform procedural care. Scheduling of shared resources for procedural care must be sufficiently nimble to address increasing wait-lists in areas such as electrophysiology (EP) ablations and transcatheter aortic valve implantation (TAVI), while concurrently being able to address acute needs, such as cardiac device implants, diagnostic angiography, or percutaneous coronary intervention (PCI). This will require new models of cardiac catheterization lab operations that emphasize flexibility.

iv. **Diagnostic Care:**

It is essential that diagnostic cardiac testing access is maintained. However, the potential increased risk of exposure and infection highlights the importance of following appropriate use criteria. This applies to both ambulatory and inpatient testing, including electrocardiography (ECG), holter monitoring, stress testing, echocardiography, nuclear imaging, cardiac computed tomography (CCT), and cardiac magnetic resonance imaging (CMR). Appropriate diagnostic testing may involve utilization rates at or near pre-pandemic levels, although a modest reduction in testing may be necessary during surges if hospital resources and staff are redeployed for COVID-19 clinical activities. During periods of constrained hospital resources, and depending on local conditions, patients may be triaged based on test indication. When deciding which modality has the best capability to answer the clinical query, the risk of infection and contamination for patients, health care workers, and infrastructure should also be considered in the decision-making process. Specifically, the American College of Cardiology and American

Society of Echocardiography consider trans-esophageal echocardiography (TEE) to be an aerosol generating procedure which requires additional consideration of its incremental value over trans-thoracic echocardiography (TTE). Alternative imaging modalities, including CCT, CMR and/or cardiac positron emission tomography (PET) should be considered instead of TEE, if appropriate. We recommend that local health centres consider establishing expert panels to oversee test triage processes to ensure appropriate indications and to establish the level of urgency, in line with local capacity and expertise. Local guidance and other Society recommendations regarding personal protective equipment (PPE) for TEE vary. Health care providers performing TEE may consider wearing N95 masks, in addition to standard PPE, to mitigate the risk of COVID-19 infection.

v. Surgical Care:

Surges in COVID-19 cases impact the ability to provide care to those patients in need of surgical correction of life-threatening cardiovascular conditions. It is likely that health systems will face cyclical phases of reducing and ramping up cardiac surgical activity, with ongoing strain on health care resources, access to care, and provider teams. While there is a clear need to maintain emergency services, it is also essential to ensure that those awaiting non-urgent surgery are closely followed and regularly triaged to undergo surgery as expeditiously as resources allow. Data from Ontario suggest that cardiac surgery patients have experienced harm due to pandemic-related delays. In the initial phases of the pandemic, many centres optimized capacity by adjusting case volumes up and down, relatively rapidly. This strategy provided capacity for patients with severe COVID-19-related illness that required critical care resources, while continuing to offer cardiac surgery services. Therefore, the ability to predict ICU length of stay after cardiac surgery may be useful, as it helps to predict ramp-down capacity.⁵ When strained beyond local capacity, cardiac surgery and critical care teams should consider referral beyond the usual health care institutions, regions, and/or provincial boundaries, with collaboration from governments and less-affected centres.

vi. Rehabilitation Care:

The cardiovascular community adapted cardiac rehabilitation (CR) strategies during the initial wave of the COVID-19 pandemic. Unable to continue the traditional transition from in-hospital care to onsite cardiac rehabilitation (CR), most Canadian programs developed various degrees of a virtual patient-centric model. This format blended limited face-to-face encounters with

scheduled meetings. These meetings typically began with a phone discussion on best practices for risk factor modification followed by use of technologies to enhance the exercise component and staff interaction with patients. Home-Based CR (HBCR) has enabled overcoming many long-established barriers encountered with on-site programs, including access, distance, and patients who are elderly, socioeconomically disadvantaged, and/or a minority. Challenges persist with HBCR, however. When it is not possible to offer conventional symptom-limited exercise treadmill testing prior to initiating a prescribed exercise program, alternative methods to assess functional capacity are needed. In particular, an emphasis on patient education for alarming symptoms and acceptance of reduced exercise intensity is required. CR programs must adapt to the “ebb and flow” of COVID-19 to prevent significant gaps in care delivery.

5. Conclusion

Given the demonstrated ability to rapidly create surge capacity for COVID-19-related hospitalizations, minimal cardiovascular service disruption, while ensuring provider and patient safety, is feasible. Incorporating cardiovascular leadership into pandemic planning with operational leaders is central to minimizing cardiovascular care delivery disruptions, while maintaining critical care and inpatient surge capacity.

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