Canadian Cardiovascular Society

GUIDANCE FROM THE CCS COVID-19 RAPID RESPONSE TEAM

Reducing in-hospital spread and the optimal use of resources for the care of hospitalized cardiovascular patients during the COVID-19 pandemic

March 30, 2020

This document was developed by consensus based on information current as of March 30th, 2020. It must be adapted to your healthcare system/jurisdiction and will evolve as further data become available and experience unfolds.

Topics covered

1. Introduction

COVID-19 has resulted in substantial morbidity and mortality worldwide, and patients with cardiovascular disease burden appear particularly vulnerable [(1)]. Nosocomial spread amongst and between healthcare providers and patients is a concern, including those initially admitted with non-COVID-19 diagnoses[(2)]. At the same time, many health systems have reported significant shortages in resources required in the care of confirmed or suspected COVID-19 patients, including personal protective equipment (PPE)[(3)]. It is important to provide pragmatic strategies to optimize safety for cardiac patients and healthcare providers (HCPs), while preventing in-hospital spread and preserving hospital resources (including PPE).

2. Overarching principle: Limit personal encounters

Wherever possible, HCPs should limit the number of personal encounters with patients. If personal encounters are necessary (e.g., change in patient clinical status), efforts should be made to align all necessary procedures or interventions and minimize the number of HCPs exposed. Consider a single physician's involvement, such as one trainee or the most responsible physician. A single nurse can perform a clinical examination, start an intravenous (IV) line and administer medication during one encounter, using the same PPE. These measures may balance the risk of exposure frequency with individual patients' risks of an adverse event. As such, decisions around clinical, diagnostic and therapeutic intensity need to be individualized.

3. Strategies to limit personal encounters

a) Limit routine investigation to those essential to patient management.

i. Avoid daily bloodwork and/or ECGs

ii. Minimize serial blood draws (e.g., troponin, lactate, NT-proBNP)

iii. Order x-rays sparingly

b) Consider reducing the dosing frequency and/or changing the route of medication administration.

i. Switch to once-daily medications. For example, metoprolol to bisoprolol, IV unfractionated heparin to low molecular weight heparin, daily vs twice-daily furosemide dosing, or minimizing sliding scale insulin.

ii. For inhaled medications, order nebulizers only if absolutely necessary. Nebulizer treatment is considered an aerosol-generating medical procedure (AGMP) and requires HCPs to don full PPE, including N95 masks. Note that many hospitals in Canada are restricting the use of nebulizers during the COVID-19 pandemic. Consult with your Pharmacy Department for updated local guidelines and policies.

iii. Medications with minimal requirements for therapeutic drug monitoring or lab monitoring should be preferentially used. For instance, patients that require new oral anticoagulation should preferentially receive a direct oral anticoagulant (DOAC), and patients on warfarin who do not have stable INR control should be switched to a DOAC to reduce laboratory testing. Check with your local drug coverage policy to seek an exemption if warfarin failure or inability to monitor INR is normally required.

iv. If a medication with mandatory lab monitoring is indicated, (e.g. ACE inhibitor/ARB/ARNI for heart failure with reduced ejection fraction), optimize and stabilize medication administration early in-hospital, to minimize outpatient lab monitoring requirements upon discharge.

c) Limit direct personal contact.

i. Maximize the use of digital communication to reduce in-person encounters with patients (see section "f" below)

ii. Eliminate daily cardiac auscultation by medical staff. If necessary, have this performed by the most experienced provider. Ensure proper sterilization of stethoscopes between patients.

iii. Limit the frequency of routine vital-sign checks.

iv. Consider using point-of-care ultrasound over auscultation (not both), when available and if the expertise is available. Ensure proper sterilization of equipment following use.

v. Discontinue central lines, intravenous or arterial catheters, nasogastric tubes, or Foley catheters as soon as possible.

vi. Provide longer IV tubing to increase the distance between the HCP and the patients.

vii. Use infrared instead of oral thermometers, if possible.

viii. If consent for testing or procedures is required, consider verbal consent to minimize contact and paper, and document the verbal consent in the chart with the name of the witness.

d) Limit contact with non-essential personnel.

i. Consider removing medical, nursing and respiratory therapy students from direct patient care.

ii. Develop a local policy about minimizing exposure and risk for trainees at all levels and seek to eliminate any redundant HCPs during procedures. Check with local universities, colleges and technical institutions regarding existing student/trainee policies.

iii. Limit visits by consultant physicians and their teams, while maintaining correspondence without in-person encounters (i.e., digital).

iv. Encourage bedside personnel to perform ECGs, if capable (especially in critical care areas), to reduce number of HCPs exposed.

v. Use point of care ultrasound or limited echocardiographic studies where it is sufficient to answer the clinical question. Transesophageal echocardiography should only be performed in emergent or urgent patients by an experienced operator.

vi. Consider dedicated diagnostic testing equipment including stethoscopes, ECG carts or portable echocardiography machines in high-acquisition areas to facilitate cleaning and reduce traffic.

vii. Control family member visits. Promote the use of mobile technologies for communication (e.g., FaceTime, Skype). Note that special considerations may apply for pediatric patients. Adhere to local institutional visitation and screening protocols.

e) Ensure invasive procedures are performed by the most experienced personnel.

i. Invasive procedures include placement of venous catheters, Swan Ganz catheters, arterial lines, transvenous pacemakers and pericardiocentesis.

ii. Interventional and electrophysiology services should have protocols for minimizing operator and staff during procedures. Consult the guidance document from the Canadian Association of Interventional Cardiology.

f) Reduce face-to-face communication.

i. Consider use of telephones/cell phones/written signage to communicate with patients rather than face-to-face interactions. This may include in-patient consultations. This is particularly

relevant in patients with confirmed COVID-19. Ensure technology platforms comply with personal health information legislation in your jurisdiction, and institutional policy.

ii. Hospitals may consider providing communication devices to patients, if they do not have one (tablet or smartphone).

iii. Virtual or telephone platforms may be considered for multidisciplinary team rounds and care provision, including CCU, consultation teams and multidisciplinary clinics.

iv. Discharge planning should focus on earliest discharge with planned supports from community resources, including advanced practice nursing, office-based consultants and primary care providers, preferably by telehealth or virtual care when feasible.

v. Encourage discharge prescriptions to be faxed to the pharmacy to prevent patients or family members from dropping off the prescription in-person. Encourage contactless medication pickup from pharmacies.

g) Limit HCP exposure during cardiac arrests involving known or suspected COVID-19 patients.

i. Be aware of the most current local protocol, which may be rapidly evolving.

ii. Basic principles, include but are not limited to:

- **There is no medical emergency that requires HCP intervention without proper PPE —** do not place other HCPs, patients and families at risk.
- Minimize the number of providers involved in resuscitation.
- Ensure the use of PPE (including N95 masks), as intubation is an aerosol-generating medical procedure (AGMP).
- Assess for pulse using the femoral/brachial artery (not carotid).
- Reduce aerosolization by draping a patient's airway with recommended protective material before beginning CPR.
- Consider mechanical compression device (such as LUCAS), if available, when CPR is required.
- Avoid AGMP, including high-flow heated humidity oxygen therapy devices (ARVO, Optiflow™), and non-invasive ventilation (CPAP/BiPAP).
- The airway should be rapidly secured by the most experienced provider. The room door should be closed. Pre-oxygenation should be performed as much as possible by non-invasive means. Bag-mask ventilation increases the risk of aerosolization. Intubation is usually performed with rapid sequence induction (deep sedation and neuromuscular blocker). The patient should not be bagged until endotracheal tube cuff is inflated.

h) PPE guidelines specific to your healthcare system should be strictly adhered to.

i. **Check with local Infection Prevention and Control (IPC) daily to ensure familiarity with recommended PPE.** Be aware of PPE implementation location, extent of

recommended equipment, and approach to screening and PPE on COVID positive, suspected and unknown patients.

ii. **Handwashing** is paramount, since Sars-CoV-2 is highly transmissible through multiple vectors. Strict attention to proper hand hygiene remains a universal approach to prevent infection.

iii. Adhere to local screening, including temperature testing, and dress code guidance.

iv. Donning and doffing protocols should be reviewed and practiced in anticipation of a marked increase in the number of cases. Consider assigning a "PPE spotter" on the team/ward to educate and ensure proper donning and doffing (resources below).

4. Additional Resources

- ACC's COVID Hub
  American College of Cardiology
- **How to conduct a safe echocardiogram**
  COVID-19 Preparedness for Echo Labs: Insights from the Frontlines
  American Society of Echo (also posted at www.csecho.ca)
- Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019(COVID-19)
  Society of Critical Care Medicine
- Personal Protective Equipment, Contact and Droplet, COVID-19 (self-directed learning)
  Alberta Health Services
- Donning and doffing of PPE (video)
  Trillium Health Partners
- The correct order for putting on and the safe order for removal and disposal of PPE (video)
  NHS Scotland
- During cardiac emergencies in the cathlab with patients with COVID
  COVID and urgent cardiac procedures at Imperial College NHS Trust (video)
- Rational use of face masks during the COVID-19 pandemic
  The Lancet
- Safe Code Blue
  COVID-19 patient being resuscitated safely- Immersive Simulation by the ICAST team
  Imperial College, London
- Human Resources and Capacity Document:
  U.S. ICU Resource Availability for COVID-19
  Society of Critical Care Medicine

5. References

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2. Bedford J, Enria D, Giesecke J, Heymann DL, Ihekweazu C, Kobinger G, et al. COVID-19: towards controlling of a pandemic. The Lancet (395), 2020. https://doi.org/10.1016/S0140-6736(20)30673-5
3. Ranney ML, Griffeth V, Jha AK. Critical Supply Shortages — The Need for Ventilators and Personal Protective Equipment during the Covid-19 Pandemic. New England Journal of Medicine. 2020. DOI: 10.1056/NEJMp2006141

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