



Practice of Echocardiography During the COVID-19 Pandemic: Guidance from the Canadian Society of Echocardiography

Background: The COVID-19 pandemic is a global crisis and as such poses significant risk to our community and its health care providers. Echocardiography remains a critically important cardiac imaging modality that cardiac specialists use to assess and help manage patients with cardiovascular diseases. These will include patients infected with COVID-19 who may present due to several factors: 1) patients with COVID-19 may have similar symptoms to cardiac patients (dyspnea, chest discomfort), 2) COVID-19 can result in cardiovascular manifestations including myocardial injury, myocarditis and/or cardiomyopathy and 3) pre-existing cardiovascular disease is common in COVID-19 patients and is associated with worse outcomes. Our practice entails close contact with our patients during scanning, and as such our practitioners are at high risk for infection particularly when caring for patients confirmed or suspected to have COVID-19. In the current context of confirmed community spread, increased vigilance is necessary through escalating precautions. Echocardiography labs must be prepared to adjust their practices to best serve their patients, aid in the management of COVID-19 patients, while doing their best to protect their staff and keep their community safe during this pandemic.

The following guidance and recommendations reflect input from the Board of the Canadian Society of Echocardiography (CSE) and key opinion leaders from the echocardiography community across Canada. We recognize that recommendations may change as the situation evolves and evidence accumulates to better inform our practice.

Recommendations:

1. Echocardiograms (transthoracic (TTE), transesophageal (TEE) and stress echocardiograms) should only be performed for (1) urgent indications or to facilitate hospital discharge and (2) when the information provided is considered essential for patient management. Generally, an urgent outpatient echo should be considered as one in which the results would be expected to prevent an adverse patient outcome or hospital admission within the next 2-4 weeks (e.g. to guide or initiate chemotherapy, in the setting of new suspected severe symptomatic aortic stenosis, new or worsening NYHA class II or IV heart failure, intermediate or high pre-test probability for infective endocarditis). Patient specific factors and the implications of the results on subsequent patient management should also be considered in determining the urgency of an echocardiogram and may require a case by case evaluation.
2. All other (non-urgent) echocardiograms should be considered elective and should be deferred. Deferred studies must be tracked so that they can be re-scheduled when normal operations resume. Referring physicians must be made aware of the deferred echocardiograms to allow them to re-request the echocardiogram if the indication is in fact urgent.
3. Echocardiography labs should designate an experienced and qualified echocardiographer, such as the Medical Director or their designate, to triage bookings,

identify non-urgent echos, track all deferred studies, and provide consultation regarding patients potentially requiring urgent exams. Appropriate administrative support should be provided for these tasks.

4. Echocardiograms should be performed according to local Public Health Standards and institutional Infection Prevention and Control (IPAC). This includes meticulous and frequent hand washing/sanitization and use of personal protective equipment (PPE). Individual practices will vary depending on local expert opinion and should take into account local supplies and availability of PPE. To conserve PPE, many sites recommend the continued use of a single mask unless it becomes wet or soiled. At present time for most echocardiography labs, the minimum for scanning a confirmed or suspected COVID-19 patient would include gown, glove, shoe protection, surgical mask & face/eye shield for contact and droplet precautions. For lower risk patients (not-suspected or COVID negative patients), a surgical mask, gloves and subsequent handwashing/sanitizing is currently thought to be adequate. Correct donning and doffing of PPE remains critical in order to protect against contamination – use of a spotter or “buddy” can be helpful to ensure correct procedure. Some institutions are also requiring patients to wear masks.
5. The CSE considers TEE to be an aerosol-generating medical procedure (AGMP) (such as bronchoscopy, endotracheal intubation, and open suctioning of the respiratory tract), due to the risk of inadvertent endotracheal intubation, potential for extensive coughing and the requirement for suctioning of the oropharynx. We recognize there is debate among infection control experts as to whether TEE constitutes an AGMP that warrants additional protection with an N95 or similar particulate respirator and whether a negative-pressure room in COVID suspected or positive individuals is required. Given the potential increased risk, the decision as to whether a TEE is sufficiently warranted should only be made after completion of a TTE and in consultation with an echocardiographer. If a TEE must occur in COVID positive or suspected patient, it should be performed with essential staff only. The use of a particulate respirator or surgical mask with or without visor in patients with unknown COVID status or a negative screening questionnaire should be guided by local Public Health Standards and institutional IPAC teams.
6. Echo protocols and scanning time should be minimized to obtain essential diagnostic images that address the study indication – this will limit sonographer exposure and is particularly important when scanning confirmed or suspected COVID-19 cases. Protocols also need to be complete enough to avoid additional repeat studies. Measurements should be performed off-line after study completion. Ultrasound-enhancing agents should be used only when necessary to obtain diagnostic images, using pre-prepared syringes available “a priori” and administered by the echo scanner when imaging confirmed or suspected COVID-19 cases. Appropriate use of ultrasound-enhancing agents may shorten echocardiographic studies in these technically difficult patients.
7. Thorough equipment cleaning can be difficult due to crevices and extra attention is required to ensure full disinfection and eradication of the virus. For studies on COVID-19 confirmed or suspected cases, double cleaning inside the room and again outside of the room is preferred. Approved cleaning products will vary depending on the vendor, and the equipment component (for example the touch panel or monitor screen). Ideally, vendor-specific information should be followed.
8. For COVID-19 positive or suspected patients, a dedicated echocardiographic system should be identified and used exclusively. Ideally, this system should be adequate for portable/ICU studies and simpler to fully sanitize. All extraneous components (ECG

leads, non-essential probes, cables) should be removed to avoid contamination and simplify sanitization. Performing these studies portably on inpatients rather than transferring patients within the hospital is preferable. A dedicated room should be identified for scanning COVID positive outpatients requiring urgent echocardiograms.

9. For COVID-19 positive or suspected patients, point-of-care ultrasound (POCUS) with handheld devices performed by the patient's clinician may be helpful in avoiding a TTE, triaging or focusing a subsequent TTE, and for on-call studies. If possible, saved images should be archived for subsequent review to determine if a TTE is required. Some systems have the ability to remotely upload studies, permitting for near real-time review of images acquired by a non-expert physician (or even real-time guidance) by an expert echocardiographer to address the clinical question. POCUS equipment is also subject to the same cleaning and disinfecting requirements as other equipment.
10. For COVID-19 suspected patients, consideration should be given to deferring an urgent echocardiogram until the COVID-19 testing is completed and the results known. This is a clinical decision made in consultation with the attending echocardiographer and the referring physician.
11. Attempts should be made to maintain physical distancing within the echo reading area. Such processes include avoiding side-by-side reading on work stations, reducing the number of readers to the minimum required for the case volume, avoiding multiple readers during the day, restricting access of non-echo staff to the echo reading room to avoid direct physical person to person contact, and promoting remote reading. It is important that instituted processes maintain important physician/sonographer case discussions, and the ability of referring physicians to review and discuss cases.
12. Exposure of trainees (sonographers, residents, fellows) to COVID-19 positive or suspected patients should be limited unless required for service delivery. Alternative virtual means to deliver trainee education should be considered and implemented.

We will continue to provide updates as more information becomes available.

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Additional Resources:

<https://www.asecho.org/wp-content/uploads/2020/03/ASE-COVID-Statement-FINAL.docx3-25-20-003.pdf>

[https://www.corhealthontario.ca/CorHealth-COVID-19-Cardiac-Memo2-Provision-of-Hospital-Echocardiography-Services-During-COVID-19-\(March-25-2020\).pdf](https://www.corhealthontario.ca/CorHealth-COVID-19-Cardiac-Memo2-Provision-of-Hospital-Echocardiography-Services-During-COVID-19-(March-25-2020).pdf)

<https://www.corhealthontario.ca/CorHealth-COVID-19-Cardiac-Memo4-Provision-of-Non-Hospital-Echocardiography-Services-During-COVID-19.pdf>

http://www.ccs.ca/images/Images_2020/Guidance_on_hospital-based_care_and_cardiac_procedure_use_19Mar2020.pdf

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