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Specific Considerations for Sonographers When Performing Echocardiograms During the 2019 Novel Coronavirus Outbreak: Supplement to the American Society of Echocardiography Statement

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Background

The American Society of Echocardiography (ASE) recently provided the “ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak.”¹ This supplement focuses on three key areas of that document: i) whom to scan, ii) where to scan, and iii) how to scan, with additional details and resources to guide sonographer practice.

Whom to Scan

Only emergent essential echocardiography studies should be performed to limit the risk of exposure to other patients and healthcare providers. Several professional societies have provided statements that all non-essential ultrasound examinations be rescheduled for a later date to reduce the risk of exposure to the COVID-19 virus.¹⁻⁴ Various mechanisms for doing this have been advocated based on ultrasound specialty; and definitions of essential may be determined by local and institutional standards.¹⁻⁴ In addition to the guidance provided in the “ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak” main document, sites are also implementing additional requirements for placing orders. These include approval of the procedure by a cardiologist or cardiology fellow, review of the proposed study with the cardiologist to plan the examination and determine if a comprehensive echocardiogram is needed; and justification for why the echocardiogram is to be performed emergently and why it is essential. In general, there is consensus that echo studies for patients with heart failure, heart transplant, and ongoing chemotherapy or stem cell transplant are considered essential (the list is not all-inclusive). Sonographers are encouraged to work with their medical team to reschedule and/or defer all non-essential/emergent patients.

Within the echo lab, there should be tracking and rotation of sonographers performing the COVID-suspected and/or -positive patients in order to reduce exposure of any one team member and the potential for transmission to an entire team or lab.

Where to Scan

The goal is to limit exposure of the COVID-19 virus to as few individuals as possible. Strategies for sonographers to consider are as follows: using a dedicated ultrasound system(s) and room(s) for performing all suspected and/or confirmed COVID-19 cases, performing all inpatient examinations portably, and first using hand-held devices to determine if a complete comprehensive echocardiogram is needed. The advantage of hand-held devices in the COVID-19 environment is that these devices can be completely draped and are easily cleaned. Use of hand-held devices by other trained providers may limit exposure to sonographers and conserve PPE. In this scenario, it is recommended that devices that offer remote connection to PACS systems be utilized. Sonographers may be involved in producing training videos, and can be available remotely to facilitate the use of hand-held devices to tailor examinations and acquire additional views that may not be included as part of the traditional point-of-care ultrasound imaging. Utilizing hand-held devices that connect remotely (i.e. wireless network, cloud, etc.) is desirable, as the images can be

sent directly to the echocardiography laboratory workstation for immediate review by a cardiologist to determine whether a comprehensive echocardiogram is needed.

How to Scan

As stated previously, the goal is to limit exposure. Appropriate personal protection equipment should always be used based on the patient status (See Figure 1 in the main document, “ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak”). In addition to the use of appropriate PPE, sonographers can employ strategies that limit exposure while actually scanning (adjusting protocols/technique) and through appropriate cleaning of equipment. These are described below. Refer to your institution’s safety guidelines for appropriate PPE and protocol for donning & doffing the PPE¹. Additional information regarding the types of PPE are described in sections 4b and 10 in the “ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak.”¹

One strategy for limiting exposure is shortening the examination time. To shorten exam time, sonographers should have discussions with their medical team to determine if a comprehensive echocardiogram (with or without contrast) is needed based on the patient’s history and current medical history. Cardiovascular sequelae associated with COVID-19 have been previously described,⁵⁻⁸ and an abbreviated, limited, or focused examination might yield the desired information while decreasing the amount of time needed for the sonographer to be exposed to the patient.

In addition to using abbreviated imaging protocols, measurements should be made offline in the echocardiography laboratory to shorten the time in the room with the patient. In general, there is consensus that echo studies in de novo patients be limited to assessing LV and RV size and function, with screening for valvular disease. As myocarditis is a potential COVID-induced pathology, global longitudinal strain assessment may be performed from this limited study. Follow-up studies should be discussed ahead of time to identify the imaging goals in an effort to reduce the exam time and exposure.

Sonographers may want to consider scanning right-handed so that they are positioned away from the patient’s face. Right-handed scanning should only be considered providing the sonographer is proficient at scanning right-handed and would not incur additional scanning time. Another strategy is to utilize providers who are trained in point-of-care cardiac imaging to perform a screening echocardiogram and send images remotely to PACS for expert interpretation. Then, after the expert has reviewed the images, a decision can be made if a full comprehensive echocardiogram is needed.

Another way to limit exposure is to keep equipment clean and disinfected. Systems with flatter surfaces and fewer crevices will be easier to clean and disinfect. Thus, if an echocardiography laboratory has the choice of selecting an ultrasound system with a touch screen and fewer crevices (such as a keyboard), it may be desirable to use this piece of equipment to perform all suspected/confirmed cases of COVID-19.⁶ Single use gel packets (not bottle) should be used when entering a room to scan a suspected and/or confirmed COVID-19 patient and unused gel packets can be discarded in room. If single use gel packets are not available, an alternative may be to fill syringes with ultrasound gel to be used in place of the single use packet. The gel filled syringes can then be discarded after the exam is completed. In addition, draping the equipment with plastic covers and using transducer covers (if available) will further help with cleaning and disinfecting equipment (see Figure 1).⁹⁻¹³ In rooms in which patients are on ventilators and individuals and equipment are exposed to airborne pathogens, the transducer should be draped.¹⁰ Hand-held devices again may be used as a first line screening device, as these systems are easily cleaned. Based on current CDC Guidelines¹¹ and American Institute of Ultrasound in Medicine's updated statement "Guidelines for Cleaning and Preparing External- and Internal-Use Ultrasound Transducers and Equipment Between Patients as well as Safe Handling and Use of Ultrasound Coupling Gel," low level disinfection (LLD) is still appropriate for external and interventional procedures and a list of approved disinfectants for use with COVID-19 is available online.^{9,12,14}

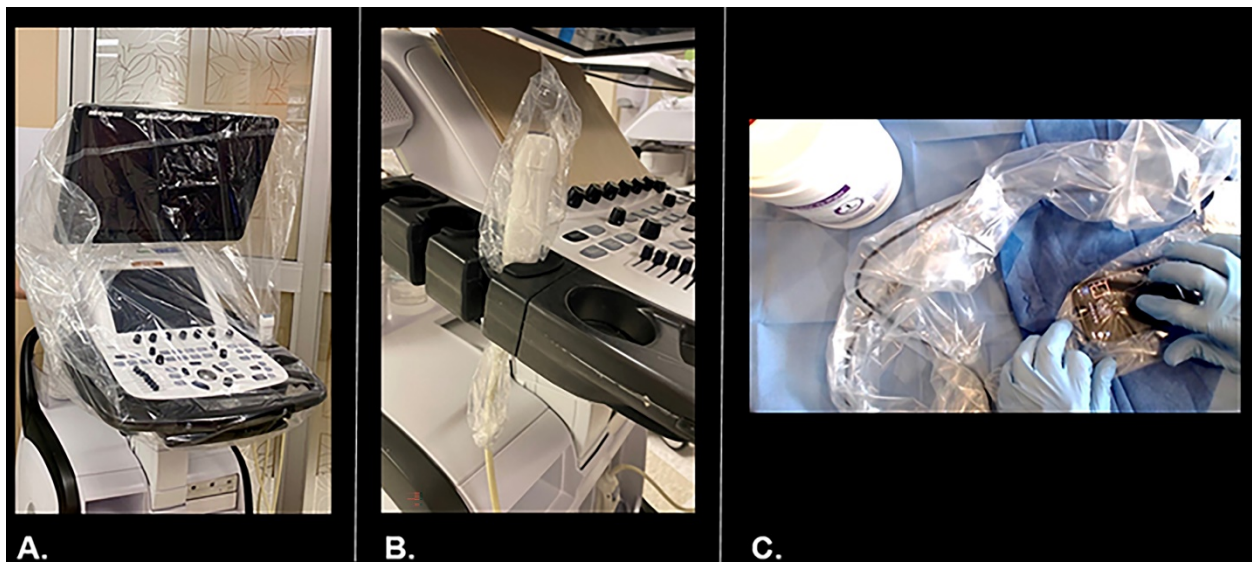


Figure 1. Panel A draped ultrasound system. Panel B draped transducer. Panel C draped hand held system. Images reproduced with permission from: Stainback R, Plana JC, Coulter SA, Krajcer Z. Cardiology in the Time of COVID-19: Troponin Assessment, Telemetry & Echo Lab. Texas Heart Institute. Available online: <https://youtu.be/ZoNrhzkgLhY>. Accessed April 2, 2020.

Prior to entry into a room to scan a suspected and/or confirmed COVID-19 patient, all ancillary equipment (extra transducer, EKG leads, linens, etc.) should be removed from the ultrasound system to limit exposure of additional equipment. Sonographers should explore if the patient is already hooked up to an ECG system that could be imported into the echocardiography machine, versus taking the ultrasound system cable and ECG leads. This reduces the need for cleaning ECG cables and leads, which may be difficult to disinfect. If available, the use of a barrier between the bed (where the patient is lying) and sonographer could be set up prior to imaging (see Figure 2).
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Figure 2. Barrier example used between the patient and the sonographer.¹⁵⁻¹⁷ This is a posed photograph demonstrating the barrier technique and how the sonographer arm can maneuver under the barrier shield. If this were a real situation the sonographer would be wearing appropriate personal protective equipment.

The equipment should be cleaned after the exam is performed. The ultrasound equipment needs to be cleaned in entirety from top to bottom including the wheels. Equipment should be cleaned in the anteroom or immediately outside of the patient's room to limit exposure to others. Cleaning of equipment and doffing of PPE should be followed per institutional standards.¹

The focus above has been to address sonographer specific issues for performing transthoracic echocardiography examinations (TTE). Transesophageal echocardiography considerations are addressed in the Council on Perioperative Echocardiography (COPE) "Specific Considerations for the Protection of Patients and Echocardiography Service Providers when Performing Perioperative or Periprocedural Transesophageal Echocardiography during the 2019 Novel Coronavirus Outbreak: Council on Perioperative Echocardiography Supplement to the Statement of the American Society of Echocardiography."¹⁸

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