

ADDENDUM K

TEE ECHO Contingency Algorithm for COVID-19

Created: April 3, 2020

Revised: April 8, 2020



* All diagnostic TEE requests should be carefully reviewed to determine appropriateness level and sense of urgency. Institutional guidelines should be followed when applicable (see endocarditis SBAR – separate document). Institutional guidelines for other mainstream diagnostic TEE indications will be developed based on necessity.

** Patients have to test negative for COVID within 72 hrs of the procedure date for TEE to be performed under SOP. If testing is performed outside the 72 hr window, then the TEE will be rescheduled to allow for repeat testing, or performed under COVID PPE. Decisions would be made on a case by case basis.

Surgical/Procedural Case Classification:

Class A - Life/limb at risk: should be done now.

Class B - Time sensitive outcome necessitating procedure within 24 hours: short delays acceptable.

Class C - Time sensitive outcome necessitating procedure within 4 weeks: reschedule at Nebraska Medicine within 4 weeks as resources permit and at the discretion of the surgical/anesthesiology medical directors. In the alternative, and as otherwise might be necessary, you can arrange to transfer care of your patient to a community colleague.

Class D - Can wait 4 - 12 weeks or longer without substantial change in outcome: reschedule at Nebraska Medicine for later date.

Class E - Can wait greater than 12 weeks without substantial change in outcome: postpone and reassess in 12 weeks for rescheduling at Nebraska Medicine.

Outpatient COVID Testing Procedure for Aerosol Generating Procedures (AGP's):

Primary Care Phase 1 Clinics (PC1) are dedicated to partnering with you to ensure COVID-19 specimen collection is completed for identified perioperative patients. This process is confirmed for patients that have been screened to be asymptomatic and require screening. Symptomatic patients should be assessed by the surgeon and/or PCP for further evaluation and symptomatic testing as appropriate. Effective Monday, March 30:

- Patient meets requirement for specimen collection per COVID-19 Procedure Guidelines
- Operative department places order LAB6400 COVID-19 by PCR
- Operative department calls 402-559-0440 between hours of 0900-1600
 - All COVID-10 specimen collection is performed 48-72 hours pre-procedure
 - Patient will be scheduled at a PC1 (Clarkson Family Medicine, Brentwood, Chalco, Elkhorn, Eagle Run, Fontenelle)
 - Medical Reception team will provide detailed patient instructions by PC1 location, to include the patient remaining in their vehicle upon arrival
- COVID-19 specimen collection complete

- Orders are required by the operative department in order for collection to take place
- Results will be routed to the ordering provider of the operative department

SCENARIO 1: COVID POSITIVE TESTING

- A. Patient already intubated: Use clean probe sheathing technique and full COVID PPE.
- B. Patient is not intubated: Consider alternative, non-aerosol generating imaging modalities. If TEE still needed, then intubate trachea, wait for amount of time needed for sufficient air exchange based on location, then proceed with TEE using clean probe sheathing technique. All operators under full COVID PPE.

SCENARIO 2: COVID NEGATIVE TESTING WITHIN 72 HRS

Perform TEE under SOP. No COVID PPE necessary.

SCENARIO 3: ASYMPTOMATIC PATIENT WITH COVID STATUS UNKNOWN OR TEST RESULTS PENDING

Perform tracheal intubation under full COVID PPE by anesthesiologist, wait for amount of time needed for sufficient air exchange based on location, then team will proceed with TEE using clean probe sheathing technique under SOP for entire TEE procedure. AT conclusion of TEE, the entire team except for the anesthesiologist will need to exit the room with TTE probe still in esophagus. Tracheal AND esophageal extubation will then be performed under full COVID PPE by the anesthesiologist in keeping with guidelines for prolonged/extended PPE use. Rationale for this approach:

- Rationale: Once intubated, use of clean probe sheathing technique in combination with tracheal intubation should render TEE a non-Aerosol Generating Procedure, allowing for conservation of PPE for rest of the team.

SBAR describing considerations for limiting TEE for endocarditis during COVID 19 pandemic

Situation: A plan is needed to limit TEE during COVID 19 pandemic.

Background: Transesophageal echocardiography is an aerosol generating procedure. Since, PPE supplies are limited during COVID-19 pandemics, it is important to limit performing TEE only in those scenarios where it significantly impacts patient management.

Analysis: TEE is performed in patients for various purposes including establishing the diagnosis of infective endocarditis. As it is an aerosol generating procedures, additional precautions will need to be taken while performing TEE during COVID-19 pandemic. This will lead to increase use of PPE, supplies of which are already limited. However, TTE can be safely limited by establishing clear indications (for which TEE will definitely impact management) and by utilizing alternative diagnostic testing/imaging, when possible.

Recommendations:

1. Patients with *Staphylococcus aureus* bloodstream infection should undergo transthoracic echocardiography (TTE). Further evaluation to rule out infective endocarditis (including TEE) is not be required if the patient has uncomplicated bacteremia (improves clinically, defined source of bacteremia, no prosthetic cardiac material or implanted cardiac device, and bacteremia resolves within 72 hours).
2. In those cases of *S. aureus* bloodstream infection where clinical suspicion of infective endocarditis is very high (e.g. persistent bacteremia beyond 72 hours, bacteremia without a clear source of infection) or prosthetic cardiac material or an implanted cardiac device is present a TTE should be performed.
 - a. IF the TTE is positive for a vegetation, the need for further evaluation will be determined on a case-by-case basis. If further evaluation is deemed necessary (e.g to rule out suspected abscess formation, paravalvular tissue extension, need for device extraction, etc.), alternative diagnostic strategies (such as PET/CT or cardiac MRI) should be considered first. TEE should be considered as a last resort.
 - b. If the TTE is negative or inconclusive (poor quality), alternative diagnostic strategies (such as PET/CT scan) should be considered first. TEE should be considered as a last resort in these scenarios.
3. Patients with complicated *S. aureus* bloodstream infection due to an identified source (e.g. lack of clinical improvement and/or persistent bacteremia beyond 72 hours), whose therapeutic plans are unlikely to change even if a diagnosis of infective endocarditis is established and who have inconclusive or negative TTE, should be treated with a prolonged course of antibiotics for presumed infective endocarditis.
4. The above-mentioned principles will also be applicable to ruling out infective endocarditis secondary to all other pathogens (*S. viridans*, Enterococci, etc.).

5. If TEE is deemed necessary, then the procedure should be performed in accordance with the established infection control guidance.

CT Anesthesia and Cardiology coverage approach:

1. Prior to the TEE, Cardiology and CT anesthesia will perform a quick huddle outside the procedure room to discuss the objectives of the study and go over patient and team safety. Sonographer will provide an Echo machine and a clean TEE probe.
2. Cardiac anesthesia will proceed with endotracheal intubation and TEE probe placement with sheath over probe technique (both aerosol generating procedures) using the intubation partner process. Cardiology will be immediately available outside the procedure room and logged in to ISCV for image review.
3. If not in a negative pressure environment, there will be a 15-20 min time period in which no one can enter or leave the room to allow for sufficient air exchange. The CT anesthesiologist will use that time to start imaging using a wirelessly connected echo machine that is constantly uploading (trickling) images to ISCV. During the time the room is “de-gassing,” if for any reason someone needs to enter the room for patient care, etc... it can be done – staff need to be wearing appropriate PPE (N95 or higher).
4. The cardiologist will perform live imaging review and will communicate any suggestions to the cardiac anesthesiologist over speakerphone during that mandatory wait time.
5. Following the 15-20 mins of closed room time, Cardiologist will determine the need for performing further imaging. If so, then due to lack of further aerosol generation while imaging with a sheathed probe and a secured airway, Cardiologist can enter the room with standard PPE to complete the study.
6. Prior to TEE probe removal and tracheal extubation, both aerosol generating procedures, everyone without COVID PPE would leave the room. The CT anesthesiologist would remove the TEE probe and then proceed with extubation. Another 15-20 min of closed room time will ensue if not under negative pressure. During the time the room is “de-gassing,” if for any reason someone needs to enter the room for patient care, etc... it can be done – staff need to be wearing appropriate PPE (N95 or higher).
7. At the conclusion of the closed room time, Cardiac sonographer will reenter the room and will be responsible for cleaning both the echo machine and the TEE probe. The Cardiologist involved with the case would be responsible for reading and finalizing the TEE report.

PRIOR TO ENTERING ROOM	
	Ensure that all unnecessary materials are removed from the basket.
	Perform precautionary wipe of all surfaces with approved wipe **maintain wet time as stated by manufacturer ** For a List of approved wipes and wet times click here
INSIDE THE ROOM, ONCE ULTRASOUND COMPLETED, AFTER SANITIZING GLOVES WITH GEL, BUT BEFORE REMOVING PPE	
	Visually inspect the machine for any bodily fluid or tissue - If present, remove with wet gauze or bleach wipes
 For a list of approved wipes click here	Using approved wipe, wet all surfaces of the machine including: <ul style="list-style-type: none"> • the cord • the keyboard • the screen • probes and cords • the power cord • the lid • the wells • gel bottles • wipes containers **please remember that there is a “wet time” associated with all wipes, check the manufactures recommendation**
	While still in PPE, move the wet machine out of the room **If another person is unavailable to help, use your foot to push the machine out**
AFTER EXITING THE ROOM, WHILE WEARING CLEAN PPE	
	Visually inspect the machine for any bodily fluid or tissue. If present, remove with wipes
https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2	Using an approved wipe, wet all surfaces listed above again ** Dry completely between the 2 required “wets” **
	Maintain wet for required amount of time before considering the device decontaminated **Please check the wet times of you approved wipes and don't forget to wipe the gel bottles and wipes container as well**