

# Saudi Arabian Society of Echocardiography Recommendations for Echocardiography Service During Corona Virus Disease 2019 (COVID-19) Outbreak

Sami Ghazal<sup>1</sup>, Fatima Qaddoura<sup>2</sup>, Abdulhalim Kinsara<sup>3</sup>, Ahmed Omran<sup>4</sup>, Merna Atiyah<sup>5</sup>, Mustafa Al Refae<sup>1</sup>, Faisal Dalak<sup>6</sup>, Saeed Al Ahmari<sup>5</sup>, Abdullah Al Sehly<sup>7</sup>, Nouredin Sahal<sup>2</sup>, Ahmed Onazi<sup>3</sup>, Rima Bader<sup>8</sup>

## Introduction

The pandemic of COVID-19 along with an increasing number of patients, makes all healthcare united in the fight against COVID-19 to stop spread and improve the outcome of the patients. The cardiac patients are at a higher risk for COVID-19 and acute cardiac injury, which may require echocardiographic examination. This guidelines document is intended to quickly highlight key principles in enforcing quality and enhancing the safety of patients as well as healthcare workers during echocardiographic studies in the time of COVID-19 pandemic. The recommendation is mainly based on expert opinion due to the paucity of evidence-based data. This paper provides a general guideline that can be altered according to the hospital infection control unit. These recommendations address the indications, procedure, machine cleaning, transesophageal echocardiography, and pediatric echocardiography.

### Key point 1

- Echocardiography should be performed only if considered appropriate and will likely alter the clinical decision
- Non-urgent exam should be deferred

### Indication

The echocardiographic study should only be performed if expected to alter the clinical decision. Appropriate Use Criteria (AUC) can be reviewed [1-4], and only appropriate is considered a potential study [1].

### Staff Protection

It is essential to minimize the exposure of healthcare professionals to aerosolized particulate matter from COVID-19 infected cases. All sonographers should have an initial assessment for mask fitting according to the infection control unit at the local hospital. Sonographers with specific health problems that place them at greater risk to COVID-19 may need to be excluded from scanning high risk/confirmed cases including staff who

## SASE Recommendations for Echocardiography Service During Corona Virus Disease 2019 (COVID-19) Outbreak

are >60 years old, have chronic conditions, immunocompromised or pregnant. Echo technicians should follow standard hygiene including hand washing/ sanitization, use of gloves and facemask as per the local protocol. Sonographers are advised not to use any non-essential items (e.g. pens/bleeps/ guidelines) during scanning.

### Procedure

In general, if the echocardiographic study is not critical for decision making, the study should be deferred until the COVID-19 pandemic is resolved. If a decision is made to proceed with the echocardiographic study, a patient COVID-19 risk status should be evaluated according to the updated Saudi CDC (Saudi Center for Disease Prevention and Control) risk score and case definition [5]. If the COVID-19 risk is considered high or COVID-19 is confirmed, then an airborne precaution should be applied according to the Saudi CDC and infection control unit in the medical institute and apply a face mask to the patient if applicable. Study location should be approved by the local infection control unit; ideally, a negative pressure room should be utilized otherwise a HEPA (High-Efficiency Particulate Air) filter should be applied. Patient contact time should be limited in all situations by acquiring necessary images that address the indication of the study. In the case of COVID-19 suspected/confirmed patient, the

cardiologist should review the indication and determine the necessary images to be acquired and instruct the sonographer accordingly. Consider a left sided approach to the patient with a plastic barrier (figure 1). Avoid using ECG wires for recording, instead utilize time loop to minimize patient contact. All measurements should be done offline either on the machine or on the workstation after exiting the patient area and the machine has been properly cleaned. A dedicated echocardiography machine is recommended to be used in COVID-19 suspected/confirmed cases and preferably portable/handheld machines should be utilized if available. A disposable plastic cover is advisable if available. If the COVID-19 risk score is considered low, a droplet

### Key point 2

- Patient risk for COVID-19 should be evaluated according to the Saudi CDC guidelines
- In COVID-19 suspected/confirmed cases, the echocardiography study should be performed bedside and in infection control approved place with airborne precaution
- Limited focused imaging should be performed to minimize contact time
- All echocardiographic measurement should be performed offline after leaving the patient area
- A dedicated machine for COVID-19 suspected/confirmed cases is recommended

SASE Recommendations for Echocardiography Service During Corona Virus Disease 2019 (COVID-19) Outbreak



Figure 1. Plastic barrier is applied between the sonographer and a patient. Note the left sided image acquisition approach.

Precaution should be applied according to the local infection control unit; however, focused imaging is recommended. Transesophageal echocardiogram (TEE) is considered an aerosol generating procedure that carries a high risk of airborne disease cross infection, particularly during probe insertion and removal. However, viral transmission still possible with direct contact with patient secretions. Therefore, in the case of COVID-19 suspected/confirmed patients, an alternative modality should be strongly considered. If an alternative modality is not available, then TEE should be done

**Key point 3**

- TEE is considered an aerosol generating procedure; therefore, an alternative modality to TEE should be strongly considered
- In COVID-19 suspected/confirmed cases, TEE should be done only under strict airborne precaution
- In low risk patient for COVID-19, TEE should be done with a minimum of droplet precaution. N95 respirator is preferred to surgical mask

under strict airborne precaution according to infection control recommendations provided results will probably alter clinical management of the patient. If COVID-19 risk is low, a minimum droplet precaution should be applied. However, a respirator (N95 mask) is preferred. Moreover, limiting examination time is required in all situations.

**Machine Cleaning**

The echocardiography machine should be cleaned after each use with an infection control and machine vendor recommendations. In the case of COVID-19 suspected/confirmed patient, the machine should be cleaned twice, once before exiting the patient area and once after existing the patient's area. Workstations and work areas should be maintained clean and disinfected according to the infection control recommendations.

**Fetal and Pediatric Echo**

The lower prevalence of severe COVID-19 in the pediatric population compared to the adult population may cause an increased risk of transmission from asymptomatic or minimally symptomatic infected children, creating an increased risk for the staff and community. [6,7]

As a general principle, transthoracic, transesophageal, and fetalechocardiography should only be performed if they are expected to provide a clinical benefit. All guidelines for the

## SASE Recommendations for Echocardiography Service During Corona Virus Disease 2019 (COVID-19) Outbreak

procedure and protection described earlier in this document are applied. Parents need to practice all protection measures during the scan of their child. For fetal echocardiography, a non-urgent case should be deferred after close communication with the referring Obstetrical and Maternal Fetal Medicine team whereas in an urgent situation where a clinical decision and neonatal management plan are required echocardiography should be performed in a similar fashion to the adult echocardiography discussed earlier.

### References

1. Doherty, John U. Dehmer, Gregory J. Doherty, John U. et al. ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease. *Journal of the American Society of Echocardiography*, Volume 32, Issue 5, 553 – 579
2. Doherty, John U. et al. ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2017 Appropriate Use Criteria for Multimodality Imaging in Valvular Heart Disease. *Journal of the American Society of Echocardiography*, Volume 31, Issue 4, 381 - 404
3. Campbell, Robert M. et al, ACC/AAP/AHA/ASE/HRS/SCAI/SCCT/SCMR/SOPE 2014 Appropriate Use Criteria for Initial Transthoracic Echocardiography in Outpatient Pediatric Cardiology. *Journal of the American Society of Echocardiography*, Volume 27, Issue 12, 1247 – 1266
4. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 Appropriate Use Criteria for Echocardiography. *Journal of the American*

*Society of Echocardiography*, Volume 24, Issue 3, 229 – 267

5. Saudi Center for Disease Prevention and control, <https://covid19.cdc.gov.sa/>
6. Dong Y et al. Epidemiological Characteristics of 2143 Pediatric Patients With 2019 Coronavirus Disease in China. *Pediatrics*. 2020; doi: 10.1542/peds.2020-0702
7. Cruz A, Zeichner S. COVID-19 in Children: Initial Characterization of the Pediatric Disease. *Pediatrics*. 2020; doi: 10.152/peds.2020-0834

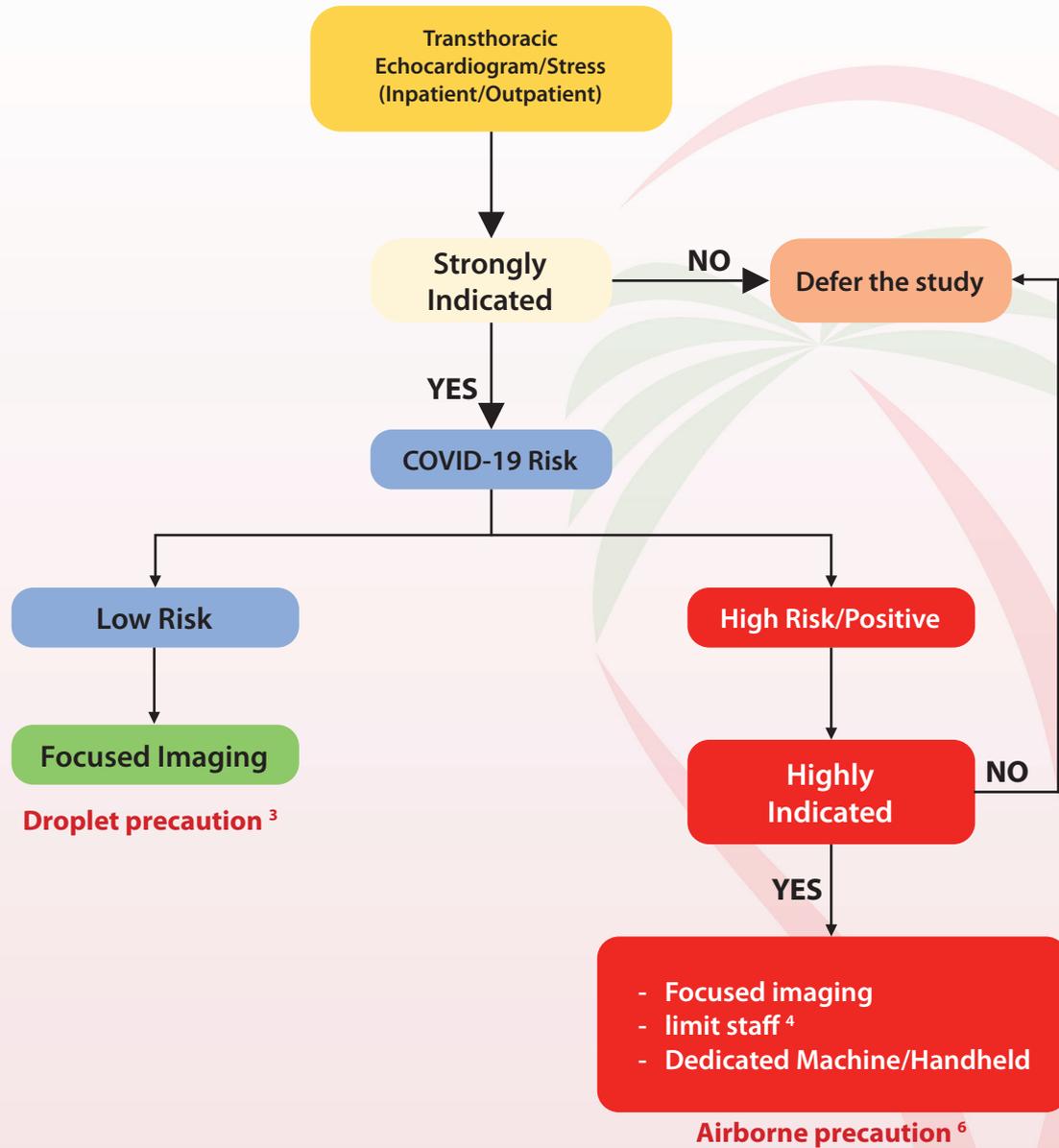
### Contributing Authors Affiliations

1. Saud Al Babbain Cardiac Center, Dammam.
2. King Fahad Military Medical Complex, Dhahran.
3. Ministry of National Guard Health Affairs, King Saud Bin Abdulaziz University for Health Sciences, COM-WR, King Abdullah International Medical Research Center.
4. Toronto General Hospital- Peter Munk Cardiac Center, University of Toronto, Canada.
5. Prince Sultan Cardiac Center, Riyadh.
6. King Fahad Medical City, Riyadh.
7. King Faisal Specialist Hospital & Research Center, Riyadh.
8. King Abdulaziz University Hospital, Jeddah

### Corresponding Author

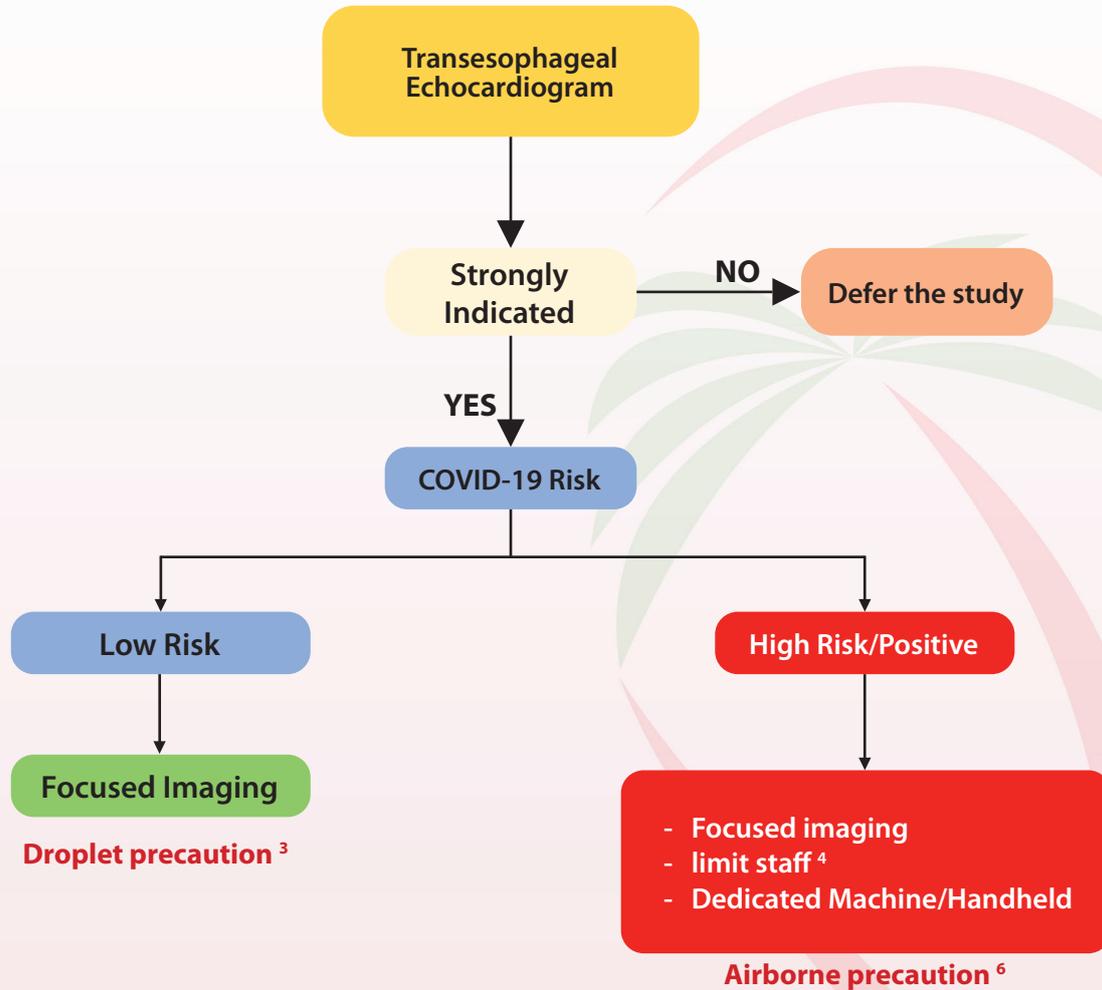
Abdulhalim Jamal Kinsara, FRCP. FACC. FESC  
Department of Cardiology, Ministry of National Guard Health Affairs, King Saud Bin Abdulaziz University for Health Sciences, COM-WR, King Abdullah International Medical Research Center Jeddah-Saudi Arabia  
E-mail: [akinsara@yahoo.com](mailto:akinsara@yahoo.com)

SASE Recommendations for Echocardiography Service During Corona Virus Disease 2019 (COVID-19) Outbreak



- 1- Indicated/ Appropriate (Result will likely alter the management plan)
- 2- Risk assessment should be performed according to Saudi Center for Disease Prevention and control visual triaging score and case definition
- 3- Include gown, gloves, headcover, facemask, and eye shield
- 4- Age >60 Immunocompromised, pregnant, chronic illness
- 5- Machine should be cleaned after use utilizing double cleaning method
- 6- Include special mask N-95 Or N-99 respirator masks, and shoe cover (clean instruments / machines and other related items)

SASE Recommendations for Echocardiography Service During Corona Virus Disease 2019 (COVID-19) Outbreak



- 1- Indicated/ Appropriate (Result will likely alter the management plan)
- 2- Risk assessment should be performed according to Saudi Center for Disease Prevention and Control visual triaging score and case definition
- 3- Include gown, gloves, headcover, facemask, and eye shield
- 4- Age >60 Immunocompromised, pregnant, chronic illness
- 5- Machine should be cleaned after use utilizing double cleaning method
- 6- Include special mask N-95 Or N-99 respirator masks, and shoe cover (clean instruments / machines and other related items)