



## **CSANZ Imaging Council Position Statement on Echocardiography Services During the COVID-19 Pandemic**

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### **Conflicts of Interest:**

Authors have declared no conflicts of interest.

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In light of the rapidly evolving COVID-19 pandemic, it was considered important for the CSANZ Imaging Council to provide a position statement to guide clinical practice and facilitate resource and service planning appropriately.

This statement represents expert consensus opinion, available evidence and international guidelines. Given the changing nature of our understanding of COVID-19, institutional protocols should increasingly be guided by evidence-based practices and recommendations.

It is important to emphasize that this is a general statement and that individual labs should consider their unique circumstances in adapting this statement to their situation. We are mindful that we cannot totally stop providing outpatient services until we reach a critical stage (i.e. level 3 or 4), However, rationalising resources and services to prepare for the pandemic and demand is crucial.

**Workforce arrangements and contingency plans:**

- Assess staff capacity and non-essential leave deferred.
- Vulnerable staff members (*includes: > 60 yo, immunocompromised, pregnant, cardio/resp disease*) excluded from scanning suspected and confirmed cases.
- Discourage/disallow drop-in visits to echo reporting rooms – ask staff to make telephone contact for urgent information.
- Consider remote and off-site reporting cover in event of staff sick leave (i.e. inter-hospital echo reporting cover)
- At peak, consider contingency roster to allow ‘stand-by’ staff i.e. alternate days or ‘teams’ of reporting doctors/sonographers - in event of multiple staff members requiring sick leave/isolation.

**Evaluation of risk for performing echocardiograms**

- All patients - inpatients and outpatients - must undergo a risk assessment for COVID-19<sup>(1)</sup> categorised as:
  - a) Minimal risk – not suspected
  - b) Moderate risk – suspected
  - c) High risk – confirmed.
- Levels of care based on risk assessment required during scanning <sup>(2)</sup>: . These protocols need to be based on advice from local institutional infection control as well, based on the extent of community transmission of COVID, when screening for risk factors may be less effective.
 

A. Standard care:	Hand washing and gloves
B. Droplet precautions:	Gown, gloves, facemask & eye shield
C. Airborne/ aerosol precautions:	as above, plus N95 masks or equivalent +/- shoe covers

**Table I:** Risk assessment and level of care for staff

Minimal Risk	Moderate Risk	High Risk
Afebrile	Current fever / temperature >37.5	Confirmed case of COVID-19
No History of recent travel and no contact with someone with recent travel	Current cough	Close contact with confirmed COVID-19 case
	Documented recent travel or close contact with someone with recent travel	
<b>Level A care while scanning</b>	<b>Level B care for TTEs Level C care for TOEs</b>	<b>Level C care TTE / TOEs</b>

*(Level of care when performing TTE scans in high risk patients might need to be adjusted according to institutional policy. The British Society of Echocardiography recommends Level C care)*

**Outpatients – TTE / ESE / DSE / TOE:**

- Where possible, contact patient prior to appointment to check if they have fever, respiratory symptoms, loss of appetite and fatigue and/or recent travel or contact with a positive or probable case for risk stratification (*as per local hospital policy*) for COVID-19; if categorised as moderate or high risk, consider postponing the echocardiogram for 2 weeks.
- All outpatients on presentation must be asked, if they have fever, respiratory symptoms, loss of appetite and fatigue and/or recent travel or contact with a positive or probable case for risk stratification for COVID-19 (*as per local hospital policy*); if categorised as moderate or high risk, consider postponing the echocardiogram for 2 weeks.
- In all instances, maintain physical distancing whilst patient is in waiting areas (whether suspected of COVID-19 or not).
- Do not allow family members to accompany patient in waiting area or while the echocardiogram is being performed.
- Triage existing and incoming requests with medical personnel – any category 2/3 requests should be deferred, if appropriate.
- Category 1/ urgent requests at discretion of medical personnel and requesting physician to be performed (this should be evaluated on a case-by-case basis).
- No outpatient elective TOEs to be performed at present, defer for 3 months and review.

**In-patient – TTE / DSE / ESE:**

- Category 1 / urgent TTE requests only (e.g. 12 month follow up for moderate AS or stable cardiomyopathy should be deferred. (*see suggested table for likely examples*).
- Exercise stress echocardiograms have increased risk of droplet spread and should be deferred where possible. e.g. if required prior to elective surgery – this should be deferred in view of elective surgery being postponed (this may not be possible in cancer-related surgery and tests should proceed if appropriate, and patient is deemed minimal risk).
- If unsure, then discussion with requesting physician to determine need.

**TOE:**

- TOE has a high risk of aerosolization and therefore high risk of spread and should be avoided <sup>(2)</sup>.
- Urgent in-patient TOEs only – i.e. strict clinical indications that will alter management – e.g. TOE for endocarditis should only be for very high index of suspicion (positive blood cultures, change in valvular regurgitation on serial TTEs, suspicion of a root abscess), where TOE will significantly alter management
- Medical officers should discuss with requesting teams the rationale and indication for TOE, and whether this will significantly alter management of the patient
- Consider serial TTE imaging or other modalities if possible <sup>(2)</sup>.
- Where possible, in a COVID suspect patient, defer the TOE till COVID status is known
- If a TOE is deemed necessary in a COVID positive patient, there should be clear discussion and agreement between requesting and performing consultant physician. The procedure must be done within the ICU negative pressure rooms. If this is not available, then an alternative might be a dedicated theatre suite (if this has been assigned) or discussed with infection control.

- Additionally, consider intubation or at minimum anaesthetic sedation for performance of TOE

### **Inpatients – logistics, protocols and indications:**

- All requests for tests on patients with suspected/confirmed COVID-19 to be approved by medical officers (*see table II below for examples*). Refer to Appropriate use criteria<sup>(3)</sup> when in doubt.
- Dedicated ultrasound machines for scanning suspected / positive COVID-19 patients (i.e. hand-held, portable, or older machines).
- All suspected / confirmed cases to be scanned at patient bedside to minimise patient transport and spread <sup>(2)</sup>.
- Training considerations – trainee sonographers should not scan or observe echoes on patients with suspected / confirmed COVID-19 <sup>(2)</sup>, to minimise patient contact, and conserve PPE.
- Limit traffic in echo lab / reporting room and social distancing e.g. if other doctors want to discuss a request or result, they should be asked to do so via phone

### **Scanning protocols <sup>(1,2)</sup>:**

- Focussed scans to be performed when appropriate in suspected/confirmed COVID patient contact:
  - Answer clinical question **only** in order to limit exposure time (know the specific indication and what exactly is being asked).
  - For suspected COVID-19 inpatients the ultrasound machine should be covered using the plastic drapes sourced from the cath lab (*see image 1 below – courtesy Dr Garvan Kane from Mayo Clinic USA*).
  - To reduce contact and exposure, avoid attaching ECG electrodes and leads and consider acquisition of images as time-gated rather than ECG-gated.
  - Preferable for right-handed scanning whenever possible.
  - When scanning left handed, consider additional barrier measures to be placed between the patient and sonographer to minimize contact (*see image 2 below – courtesy Dr. S. Moir MMC*)
  - Avoid patient breath-holding during the study
  - Only acquire images at patient bedside; perform measurements offline and not at patient bedside.
  - Avoid use of contrast, if possible. However, if contrast use is anticipated, plan ahead and take it along before starting the scan, to minimise time with patient and the wastage of PPE use. Consider using the assistance of nursing staff in the room caring for the patient to administer the bolus of contrast.

### **Point of care ultrasound (POCUS)/ Hand held devices: key modalities for screening <sup>(2)</sup>**

- Wherever possible senior/treating clinician who is caring for patient to perform handheld or POCUS (if available) for screening.
- POCUS Images should be archived and reviewed to determine the need for full study.
- This approach minimises staff exposure and conserves PPE use.
- Cleaning of the handheld or POCUS system is easier than a formal clean and disinfection of the echo machine.

**Indications for echocardiograms in the context of COVID infection:**

- In a COVID suspected case, if TTE is not urgent then await COVID-19 results, before performing the echocardiogram
- If COVID-19 suspected / positive, then echocardiogram request should be discussed with treating consultant.
- For COVID-19 suspected/confirmed cases, acceptable indications include<sup>(2)</sup> :
  - Suspicion of heart failure / myocarditis,
  - Significant arrhythmias
  - Significant ECG changes
  - More than mild pericardial effusion on chest CT
  - Haemodynamic instability or previous heart disease with shock (disproportionate to the respiratory involvement).
- In COVID positive patients, performance of TTE should be limited to instances when it would definitely impact on patient management (ie evaluation prior to ECMO etc)

**Personal protective equipment (PPE) and equipment cleaning:**

- PPE – stored appropriately with all staff knowing where items are stocked. Have protocols in place for obtaining more when stocks are low.
- Ensure all staff are trained in donning and removal of PPE
- A number of dedicated COVID-19 PPE kits containing required equipment and usage instructions to be prepared for use (*as per local hospital policy*).
- PPE minimum requirements – gloves, gown, eye protection, head cover and medical/surgical face mask. N95 mask and shoe covers if COVID-19 positive or ventilated patient <sup>(2)</sup> (*as per local hospital policy*).
- Require patient to wear mask during an echocardiogram, if positive or at high risk/suspected of having COVID-19 infection <sup>(2)</sup>.
- Usual cleaning and disinfecting protocols for equipment (once not enough – clean in room, move out of room and clean again, importance of “wet time” after wiping).
- Probe covers may be used for scanning confirmed cases as an additional barrier. (*see image 3*)
- Important to clean workstations and reporting room – wipe down keyboards, phone etc.

**References:**

1. Ingram T, Colebourn C and Pearce K. Clinical guidance regarding provision of echocardiography during the COVID-19 pandemic. *British Society of Echocardiography*. 2020
2. Kirkpatrick J, Mitchell C, Taub C, Kort S, Hung J and Swaminathan M. ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak. *American Society of Echocardiography*. 2020.
3. Douglas P, Garcia M, Haines D et.al. CCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 Appropriate Use Criteria for Echocardiography. *J Am Soc Echocardiogr* 2011;24:229-67.

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Repurpose cath lab supplies!  
Imaging COVID19 patients



**Image 1:** When scanning COVID-19 patients the ultrasound machine can be covered using the plastic drapes.



**Image 2:** Additional barrier measures can be placed between the patient and sonographer to minimize contact while scanning left handed.



**Image 3:** Probe covers may be used for scanning COVID-19 confirmed cases

**Table II:****Indications for performance of a Transthoracic echocardiogram (TTE) during COVID 19 pandemic:**

A detailed and exhaustive list of indications is not possible, but triaging will have to occur using the clinical judgement of the physicians involved, based on the principles outlined below.

Existing Category	New Category	Examples	Advice
Category 1	<b>Category 1A</b> Urgent – almost certain to result in a serious adverse clinical outcome /admission to hospital within 2 weeks if the TTE is not performed.	<ul style="list-style-type: none"> <li>• Evaluation of LV/ RV/ valvular function in a critically ill patient</li> <li>• Bacterial endocarditis (high probability)</li> <li>• Patients. presenting with chest pain to rule out RWMA (ie triage for cath lab)</li> <li>• Clinical suspicion of tamponade</li> <li>• Post STEMI to evaluate LVEF</li> <li>• Pre CABG evaluation of severity of valvular disease</li> <li>• Chemotherapy patients where TTE required prior to therapy (eg HER2 +ve pts; pts on anthracyclines with drop in LVEF)</li> <li>• Recurrent syncope with clinical suspicion of severe AS, LVOT obstruction</li> <li>• Clinically suspected cardiomyopathy with acute deterioration</li> <li>• HF patients with acute deterioration in clinical status</li> <li>• Pulmonary HT patients with deterioration in clinical status</li> </ul>	<ul style="list-style-type: none"> <li>• Perform targeted scans.</li> <li>• Ensure that risk screening is performed on ALL patients prior to TTE</li> <li>• Where high index of suspicion, see if test can be deferred till COVID status is known</li> <li>• Wear PPE</li> </ul>
	<b>Category 1B</b> Semi-Urgent – somewhat likely to result in a serious adverse clinical outcome or admission to hospital if the TTE is not performed.	<ul style="list-style-type: none"> <li>• Recurrent multiple strokes in a young patient</li> <li>• Routine evaluation of HF patient to uptitrate therapy</li> <li>• Routine evaluation in AF/ SVT patient</li> </ul>	Defer cases for 4-6 weeks and reassess (depending on crisis progression)
	<b>Category 1C</b> All other cases	<ul style="list-style-type: none"> <li>• TTE for interval change ( ie LV function)</li> </ul>	<ul style="list-style-type: none"> <li>• Return patients to waiting list – aim to perform cases within 6 months</li> </ul>
Category 2	<b>Category 2</b>	<ul style="list-style-type: none"> <li>• Pre procedural evaluation for structural intervention</li> </ul>	<ul style="list-style-type: none"> <li>• Return patients to waiting list</li> </ul>

1. **Consultants to confirm cases that should be performed under Category 1A Criteria.**
2. **All other cases scheduled in the next 4 weeks should be reviewed by the referring physician and grouped into Category 1B or 1C.**
3. **All deferred 1B procedures should be reassessed at 4 weeks in light of developments in the COVID19 pandemic.**