

Echocardiography for endocarditis during the COVID-19 pandemic.

A viewpoint from ACHD (Adult Congenital Heart Disease) Perspective.

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For the symptomatic patient with confirmed COVID-19, close contact with confirmed COVID-19, or pending result for COVID-19

Anecdotal reports suggests poor suitability for surgery if positive for COVID-19, and very high risk in aerosolising procedures of hospital staff infection.

- Assess likelihood of IE and suitability for surgery prior to any echocardiogram
- Perform Transthoracic Echocardiogram
 - **Positive Transthoracic Echocardiogram**
 - *Meets criteria for surgery and Surgical candidate:*
 - CT / PET to look for complications
 - TOE at time of surgery; Consider TOE
 - *Does **not** meet criteria for surgery, and **not** Surgical candidate*
 - CT / PET to look for complications
 - Medical management with serial TTE
 - Do not perform TOE
 - **Negative Transthoracic Echocardiogram (With Adequate Windows)**
Negative predictive value up to 97%; Sensitivity 40-66%
 - *If surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - Consider repeat TTE after a brief trial of medical therapy
 - High risk of IE before TTE assessment, or high-risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - Do not perform TOE until at least 2 weeks post positive for COVID-19 and resolution of symptoms
 - *If **not** surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - Consider repeat TTE after a brief trial of medical therapy
 - Do not perform TOE. Repeat TTE and monitor closely post treatment cessation, with low threshold for pragmatic treatment

- **Negative Transthoracic Echocardiogram (Without Adequate Windows)**
Negative predictive value likely much less than 93%; Sensitivity as low as 40%
 - *If surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - High risk of IE before echo assessment, or high risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - Do not perform TOE until at least 2 weeks post positive for COVID-19 and resolution of symptoms
 - Low risk of IE before echo assessment
 - Consider performing CT / PET or other cross-sectional imaging to detect complications of IE
 - Do not perform TOE. Repeat TTE and monitor closely for clinical progress post treatment cessation
 - *If **not** surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - Consider repeat TTE after a brief trial of medical therapy
 - Do not perform TOE. Monitor closely post treatment cessation, with low threshold for pragmatic treatment
 - High risk of IE before echo assessment, or high-risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE

For the patient with potential native IE;

- Assess likelihood of IE and suitability for surgery prior to any echocardiogram

- Perform Transthoracic Echocardiogram
 - **Positive Transthoracic Echocardiogram**
 - *Meets criteria for surgery and Surgical candidate:*
 - CT / PET to look for complications
 - TOE at time of surgery
 - *Does **not** meet criteria for surgery, and **not** Surgical candidate*
 - CT / PET to look for complications
 - Medical management with serial TTE
 - Consider local transmission patterns and risk of community spread / pre-symptomatic patient, before performing TOE

 - **Negative Transthoracic Echocardiogram (With Adequate Windows)**
Negative predictive value up to 97%; Sensitivity 40-66%
 - *If surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - Consider repeat TTE after a brief trial of medical therapy
 - High risk of IE before TTE assessment, or high-risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - Consider local transmission patterns and risk of community spread / pre-symptomatic patient, before performing TOE. Use a relatively high threshold in the well patient

 - *If **not** surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - Consider repeat TTE after a brief trial of medical therapy
 - Do not perform TOE. Repeat TTE and monitor closely post treatment cessation, with low threshold for pragmatic treatment

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 - High risk of IE before echo assessment, or high risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - Consider local transmission patterns and risk of community spread / pre-symptomatic patient, before performing TOE. Use a relatively high threshold in the well patient
 - Low risk of IE before echo assessment
 - Consider performing CT / PET or other cross-sectional imaging to detect complications of IE
 - Do not perform TOE. Repeat TTE and monitor closely for clinical progress post treatment cessation
 - *If **not** surgical candidate*
 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - Consider repeat TTE after a brief trial of medical therapy
 - Do not perform TOE. Repeat TTE and monitor closely post treatment cessation, with low threshold for pragmatic treatment
 - High risk of IE before echo assessment, or high-risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE

For the patient with potential prosthetic valve or device-related IE;

- Assess likelihood of IE and suitability for surgery prior to any echocardiogram
- Perform Transthoracic Echocardiogram
 - **Positive Transthoracic Echocardiogram**
 - Meets criteria for surgery and Surgical candidate:
 - CT / PET to look for complications
 - TOE at time of surgery
 - Does not meet criteria for surgery, and Surgical candidate
 - CT / PET to look for complications
 - Medical management with serial TTE
 - Consider local transmission patterns and risk of community spread / pre-symptomatic patient, before performing TOE
 - **Negative Transthoracic Echocardiogram (With Adequate Windows)**

Negative predictive value much less than 97%; Sensitivity 20-46%

 - Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
 - *If surgical candidate*
 - Consider repeat TTE after a brief trial of medical therapy
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - High risk of IE before TTE assessment, or high-risk features without meeting criteria for diagnosis on TTE
 - Consider local transmission patterns and risk of community spread / pre-symptomatic patient, before performing TOE. Use a relatively low threshold in patient with prosthesis
 - Low risk of IE before echo assessment
 - Do not perform TOE. Repeat TTE and monitor closely for clinical progress post treatment cessation
 - *If **not** surgical candidate*
 - Consider repeat TTE after a brief trial of medical therapy
 - Do not perform TOE. Repeat TTE and monitor closely post treatment cessation, with low threshold for pragmatic treatment

- **Negative Transthoracic Echocardiogram (Without Adequate Windows)**

Negative predictive value likely much less than 93%; Sensitivity as low as 40%

- Consider risk:benefit of pragmatic medical management in first instance, taking into account pathogen, local resistance profiles, and patient-specific factors
- *If surgical candidate*
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - High risk of IE before echo assessment, or high risk features without meeting criteria for diagnosis on TTE
 - Consider local transmission patterns and risk of community spread / pre-symptomatic patient, before performing TOE. Use a relatively high threshold in the well patient
 - Low risk of IE before echo assessment
 - Do not perform TOE. Repeat TTE and monitor closely for clinical progress post treatment cessation
- *If **not** surgical candidate*
 - High risk of IE before echo assessment, or high-risk features without meeting criteria for diagnosis on TTE
 - Perform CT / PET or other cross-sectional imaging to detect complications of IE
 - Do not perform TOE. Repeat TTE and monitor closely for clinical progress post treatment cessation, and low threshold for pragmatic treatment