Respective advantages, disadvantages and mandatory views of TTE and TEE

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No Disclosures
CRITICAL CARE ECHOCARDIOGRAPHY
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IMMEDIATE VISUAL DIAGNOSIS

GUIDANCE OF ONGOING MANAGEMENT
Machines
## Trans-Thoracic Echocardiography in ICU

<table>
<thead>
<tr>
<th>Advantages</th>
<th>Disadvantages</th>
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<tbody>
<tr>
<td>- EASY TO USE.</td>
<td>- Does not provide potential for continuous monitoring.</td>
</tr>
<tr>
<td>- AVAILABLE</td>
<td>- In several patients it is not possible to acquire all the classic echocardiographic views</td>
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<tr>
<td>- CAUSES NO HARM</td>
<td></td>
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<tr>
<td>- Information is acquired in real time.</td>
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<tr>
<td>- No health care practitioners are needed other than the performing physician</td>
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<tr>
<td>- The information is obtained before the invasive monitoring.</td>
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<tr>
<td>- COST-EFFECTIVE</td>
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Emergency echocardiography: the European Association of Cardiovascular Imaging recommendations

Patrizio Lancellotti1, Susanna Price2, Thor Edvardsen3, Bernard Cosyns4, Aleksandar N. Neskovic5, Raluca Dulgheru6, Frank A. Flachskampf7, Christian Hassager8, Agnes Pasquet9, Luna Gargani10, Maurizio Galderisi10, Nuno Cardim11, Kristina H. Haugaa1, Arnaud Ancion1, Jose-Luis Zamorano12, Erwan Donal13, Héctor Bueno14, and Gilbert Habib15

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FOCUS cardiac Ultrasound
FOCUS protocol

- Time critical scenarios (Trauma/ cardiac arrest).
- Rapid detection of significant Cardiac pathology/volume status.
- Biventricular function.
# Trans-Thoracic Echocardiography in ICU

<table>
<thead>
<tr>
<th>Concerns</th>
<th>Views</th>
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<tbody>
<tr>
<td>LV systolic function</td>
<td>Parasternal long axis short axis view, 2, 3 and 4-chamber view</td>
</tr>
<tr>
<td>Cardiac output</td>
<td>4-chamber view</td>
</tr>
<tr>
<td>Right heart assessment</td>
<td>Parasternal long axis short axis view, 4-chamber view</td>
</tr>
<tr>
<td>Pericardial disease</td>
<td>Parasternal long axis short axis view, 4-chamber view, subcostal view</td>
</tr>
<tr>
<td>Valvular disease</td>
<td>Parasternal long axis short axis view, 4-chamber view</td>
</tr>
<tr>
<td>Volume status and responsiveness</td>
<td>4-chamber view, inferior vena cava</td>
</tr>
</tbody>
</table>
STANDARD PARASTERNAL TTE VIEWS

Parasternal probe position

Subcostal probe position

Apical probe position

Aortic valve in PSAX

MVCC

LOC

Aorta level

Anterior papillary muscle

Postero-medial papillary muscle

SUBCOSTAL VIEW

M-Mode through Inferior Caval Vein

STANDARD APICAL TTE VIEWS

A4C

RA

LA

PMVL

LV

AMVL

AMV

RV

LA
Mandatory views
Trans-thoracic echocardiography

- Parasternal long axis.
- Parasternal short axis.
- Apical 4 chambers.
- Subcostal 4 chambers.
- Subcostal IVC.
Parasternal long axis
Parasternal short axis
Apical 4 chambers
Subcostal 4 chambers
Subcostal IVC
Trans-esophageal echocardiography

- Suboptimal TTE images.

- Structural not assessable by TTE.
  - Thoracic Aorta
  - LAA

- When the TTE does not answer the clinical question.
  - IE.
  - Mechanism of valvular abnormality
Transesophageal Echocardiography
Nomenclature: ASE/SCA

Upper Esophageal (UE) views
(20 - 25 cm)

Transgastric (TG) views
(40 - 45 cm)

Mid Esophageal (ME) views
(30 - 40 cm)

Deep Transgastric (TG) views
(45 - 50 cm)

Multiplanar Examination
Mandatory TEE views

Mid-esophageal

Aortic
Mid-esophageal SAX view
Mid-esophageal 4ch view
Mid-esophageal LAX view
Mid-esophageal LAX view
Mid-esophageal bicaval view
Trans-gastric SAX view PM
Deep trans-gastric view
Trans-gastric LAX view
Descending Ao. SAX view
Upper-esophageal Ascending Ao. SAX view
Upper-esophageal SAX view Ao. arch
Conclusion

- Echocardiography (TTE/TEE) is an important tool in intensivist hand.

- He just should know how to use it.

- We just tried implement basic TTE/TEE views facilitating his training; leading to improve patient care.
Thank You