PROTOCOLS FOR LUNG ULTRASOUND AND FOCUSED TRANSTHORACIC ECHOCARDIOGRAPHY

Last updated April 5, 2020

FOCUSED LUNG ULTRASOUND

FOCUSED TRANSTHORACIC ECHOCARDIOGRAPHY

CRITICAL CARE ECHOCARDIOGRAPHY EXAMINATION
**FOCUSED LUNG ULTRASOUND**

**Initial exam or Repeat exam**

**Indication(s) for exam:** dyspnea, chest pain, hypoxemia, hypotension, post-central line placement

**Regions Examined:**

<table>
<thead>
<tr>
<th>Region</th>
<th>Superior</th>
<th>Inferior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right anterior</td>
<td>Superior</td>
<td>Inferior</td>
</tr>
<tr>
<td>Right lateral</td>
<td>Superior</td>
<td>Inferior</td>
</tr>
<tr>
<td>Right posterior</td>
<td>Superior</td>
<td>Inferior</td>
</tr>
<tr>
<td>Left anterior</td>
<td>Superior</td>
<td>Inferior</td>
</tr>
<tr>
<td>Left lateral</td>
<td>Superior</td>
<td>Inferior</td>
</tr>
<tr>
<td>Left posterior</td>
<td>Superior</td>
<td>Inferior</td>
</tr>
</tbody>
</table>

**Findings:**

**Right Lung or Left Lung:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung Sliding</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Lung Point</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>A-lines</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>B-lines</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>If B-lines present &gt;3mm</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Pleural Effusion:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Simple</th>
<th>Complex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleural Effusion if present</td>
<td></td>
<td>(Plankton sign, hematocrit sign, fibrin strands, loculations)</td>
</tr>
<tr>
<td>If Large and able to estimate</td>
<td></td>
<td>amount</td>
</tr>
<tr>
<td></td>
<td></td>
<td>______ ml</td>
</tr>
</tbody>
</table>

**Lung Consolidation:**

<table>
<thead>
<tr>
<th>Region</th>
<th>Yes</th>
<th>No</th>
<th>Unable to determine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Air Bronchograms:**

<table>
<thead>
<tr>
<th>Region</th>
<th>Yes</th>
<th>No</th>
<th>Unable to determine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation:**

- No ultrasound evidence of acute pulmonary process
- Pneumothorax: Left | Right
- Pleural effusion: Left | Right
- Interstitial syndrome: Focal | Diffuse
- Lung Consolidation: specific which region identified
- Endotracheal tube position adequate/right main-stem
- Additional Comments/findings: ______________________

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# FOCUSED TRANSTHORACIC ECHOCARDIOGRAPHY

## Indication(s) for exam:
- cardiac arrest, post-cardiac arrest resuscitation, hypotension, circulatory shock, volume assessment, dysrhythmias

## View | Image Quality | Findings
--- | --- | ---
**Parasternal Long Axis** | Good Limited Poor/Unable to obtain | LV function: normal, reduced, severely reduced size greater than RVOT and ascending aorta normal shape, dilated, unable to determine present or absent <8mm, >8mm distance in mm Pleural Effusion: Present/none

**Parasternal Short Axis (Midpapillary Level)** |  | LV function: Normal, reduced, severely reduced RV size: >LV, <LV Pericardial effusion: present or absent Septal bowing, septal flattening IVS: Septal flattening If able to obtain PSSAX at the aortic valve level: amplitude of interatrial septum (<1 cm, >1.5 cm)

**Apical 4 Chamber** |  | LV function: normal, reduced, severely reduced LA enlargement RV enlargement RV function RV: LV ratio: RV<LV, RV=LV, RV>LV Pericardial effusion: present or absent

**Parasternal Long Axis** |  | LV function: normal, reduced, severely reduced LA enlargement RV enlargement RV: LV ratio: RV<LV, RV=LV, RV>LV RV function Pericardial effusion: present or absent

**Subxiphoid 4 chamber** | IVC Size: >2.1 cm, <2.1 cm, intermediate Respiratory Variation: >50%, <50%, intermediate | IVC collapsibility index % (patient ventilated or spontaneous breathing) Ascites: (Present)
CRITICAL CARE ECHOCARDIOGRAPHY EXAMINATION

Initial exam or Repeat exam

Indication(s) for exam: cardiac arrest, post-cardiac arrest resuscitation, hypotension, circulatory shock, volume assessment, dysrhythmias

Image Quality:

- Parasternal Long Axis: Good Limited Unable to obtain
- Parasternal short axis: Good Limited Unable to obtain
- Apical 4-chamber: Good Limited Unable to obtain
- Subcostal 4-chamber: Good Limited Unable to obtain
- IVC: Good Limited Unable to obtain
- Any additional views:
  - Apical 5-chamber: Good Limited Unable to obtain
  - RV inflow: Good Limited Unable to obtain
  - Apical 2-Chamber: Good Limited Unable to obtain
  - Suprasternal: Good Limited Unable to obtain

Findings:

Measurements:
LV Dimensions:
Calculated EF
LV Function: normal, hyperdynamic, reduced (mild, moderate, severe), indeterminate
LVEDA (optional): <8 cm², 8-14 cm², >14 cm², unable to obtain
Stroke Volume (optional):
  LVOTd
  LVOT VTI
RV Function: Normal or reduced
RV Size: Normal, dilated, or indeterminate
LV to RV ratio:
RV Strain: Any of these present or absent
  RV free wall (optional): <5 mm or >5 mm
  McConnell’s Sign
  Interventricular Septal bowing
  Septal bounce
  D-Sign at the level of short axis mid-papillary view
Tricuspid Regurgitation: Yes/ No, unable to assess
  If Yes PGr, estimated RVSP

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Pericardial Effusion: Present  Absent  Indeterminate Size  
If present: Small  Large
Signs of Tamponade: Yes  No
If yes: plethoric IVC, R atrial collapse, R ventricular collapse, mitral inflow variation

IVC Assessment: IVC (Pt on spontaneous or mechanical ventilation):
Normal, collapsed, dilated, unable to visualize
IVC Respiratory variation >50%  or  <50%
Maximum Diameter ______
Minimum Diameter ______
If spontaneous breathing
IVC collapsibility index: <43%  >43%
If mechanically ventilated
ΔIVC: <12%, or >12%
Distensibility Index: <18% or >18%
Estimated RAP ______
VTI Variation: <12%, >12%

Valvular Assessment:
Hemodynamically Significant or non-significant Regurgitation: Yes  No  or  Unable to determine
If yes, specify valve and view(s) in which regurgitation identified:
Hemodynamically Significant or non-significant Stenosis: Yes  No  or  Unable to determine
If yes, specify valve and view(s) in which stenosis identified:

Interpretation and clinical relevance:
- No evidence of significant cardiac dysfunction on this limited TTE
- No evidence of significant pericardial effusion on this limited TTE
- Pericardial effusion: moderate or large
  - Pericardial effusion with evidence of pericardial tamponade
- Global ventricular function: hyperdynamic, normal, reduced (mild, moderate, severe)
- No cardiac activity/ Cardiac standstill
- No evidence of RV dilation
- RV dilation/RV strain
- Evidence of hypovolemia
- No evidence of hypovolemia
- Possible valvular abnormality identified for further evaluation on comprehensive TTE/limited evaluation of valvular function on this limited TTE due to patient s/p MVR, AVR, TVR (etc.)

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