

## JVP

### 1 clip

- Long-axis clip showing tenting of JVP at its maximal height, with clear visualization of the parallel carotid artery
  - Visualize maximal diameter of JVP (avoid cylinder effect creating false tenting)
- (optional): short-axis view of JVP as probe is moved cephalad to demonstrate collapse of the vein at the height of the JVP

## IVC

### 1 clip

- Long-axis IVC view with RA-caval junction visible, ideally with hepatic vein seen entering IVC. Duration must be at minimum 1 full respiratory cycle to capture respirophasic changes.
  - Visualize maximal diameter of IVC (avoid cylinder effect)
  - Avoid false-positive collapsibility due to translation of the IVC with respiration
- (optional): still images of IVC in long-axis measuring maximal/minimal IVC diameter at 1-2cm distal to the hepatic vein
- (optional): still M-mode image showing M-mode through IVC, placed 1-2cm distal to hepatic vein, with measurements taken

# LUNG

## 8-12 clips

All clips should be 4-6 seconds in duration and demonstrate respiratory movement of the lungs/pleura (with probe stationary)

- Full lung assessment: 4-6 clips per hemi-thorax
  - Anterior chest wall: 2nd/3rd ICS, mid-clavicular line (R1/L1)
- Depth 9-13cm
  - Anterior chest wall, 5th/6th ICS, mid-clavicular line (R2/L2)
- \*Note: may be challenging on the left side, particularly in females, due the heart and/or breast tissue
- Depth 9-13cm
  - Anterior-to-mid axillary line: level of the nipple (R3/L3)
- Depth typically 10-14cm
- As high up in the axilla as possible
  - PLAPS (postero-lateral alveolar-pleural syndrome point): most posterior/dependent region (mid-to-posterior axillary line or farther back) at the costophrenic angle (R4/L4)
- Depth sufficient to allow visualization of entire intra-abdominal organ and the visible diaphragm
- Must see visualize the boundary between thorax and abdomen (no rib shadows in the way)
- \*Note: if there is dependent pathology, you're encouraged to take several clips here, in both the mid- and posterior axillary lines
  - Posterior superior chest (R5/L5)
- If patient is able to sit up/roll over
- Lateral to scapula, just below the spine of scapula

- Posterior inferior chest (R6/L6)
- If patient is able to sit up/roll over
- Lateral to scapula, at border with diaphragm (goal is to capture posterior dependent pathology)
- Pleural effusion study: complete full lung study as above
  - At least one view (Costo/PLAPS) must include:
    - Demonstrate spine sign
    - Demonstrate fluid that is contiguous and fills angulated spaces eg. costophrenic angle, area between chest wall and lung (to confirm pleural effusion)
    - Visualize consolidated/compressed lung within the pleural effusion
- Pneumothorax study: complete full lung study as above
  - Images to highlight presence/absence of pleural sliding (decreased depth/gain; linear probe; M-mode)
  - Identify lung point if present

All clips should be 4-6 seconds in duration, with probe stationary. You are always encouraged to perform all 4 cardiac views plus IVC (and additional views if possible/desired).

- Basic POCUS cardiac exam: 4 clips
  - PLAX: parasternal long axis
    - Depth adequate to see 1-2cm deep to the descending thoracic aorta
    - Clear visualization of LA, LV, mitral valve, aortic valve, LVOT/aorta, and RVOT
    - Mitral valve leaflets centered in screen

- LV captured in its widest dimension (no foreshortening), with walls as close to horizontal as possible. The LV apex should NOT be visualized.
- Clear opening of the mitral valve visualized
  - PSAX: parasternal short axis
- Level of papillary muscles (mid-ventricular level)
- Ensure adequate rotation to avoid off-axis views and a falsely flattened septum or oval appearance to heart
  - A4C: apical 4-chamber
- LV, RV, LA, RA visualized, with mitral and tricuspid valves opening
- Avoid 5-chamber view (aortic valve/LVOT in view) if possible
- Heart vertically oriented
- LV apex centered with LV chamber size maximized
- Avoid foreshortening RV (globular/ovoid appearance) by scanning too high on the chest
- Optimize visualization of myocardium
  - SX: subxiphoid
- LA, LV, RA, RV visualized, with mitral and tricuspid valves
- Heart lying horizontal/obliquely
- Isolated exam for LV systolic function: 3 clips
  - At least 2 of the above views
  - M-mode demonstrating EPSS
- Taken in PLAX with M-mode cursor placed through the tip of the anterior leaflet of the mitral valve (not chordae)
- Caliper measurements demonstrating EPSS (measure from top of E-wave to inter-ventricular septum)
- Isolated exam for pericardial effusion: 3 clips
  - 2+ cardiac clips (one of which must be PLAX or SX)

- \*Note: with cardiac clips for effusion, ensure that you have fanned through the heart to capture the largest pocket of effusion. The clip may then be taken with the probe stationary.
  - PLAX: depth at least 2cm below descending thoracic aorta (must be visualized)
- Still image of effusion with caliper measurements to document size of effusion (measured in diastole; measure largest fluid pocket)
  - PSAX, A4C or SX: depth at least 2cm below inferior LV wall, or deep enough to visualize entire effusion
- Still image with caliper measurements to document size (measured in diastole; measure largest fluid pocket)
  - 1 clip of IVC in long-axis (see above)
  - Additional images (optional)
- M-mode in PLAX demonstrating movement of RV free wall compared to IVS
- M-mode in SX demonstrating movement of RV compared to IVS
- Doppler images documenting changes in mitral/tricuspid inflows (advanced)

## CARDIAC

### 4+ clips

- Positive ascites exam: 1 clip
  - Clip in sagittal plane, lateral to the rectus sheath, demonstrating the largest fluid pocket, with fanning (lateral/medial) to demonstrate the borders of the pocket
  - Fluid should be contiguous and fill angulated spaces
- Negative ascites/free fluid exam (FAST): 7 clips showing all relevant points
  - \*Note: two points may sometimes be combined in a single clip
  - Right side: 3 points visualized
  - Morrison's pouch (hepato-renal interface)
  - Inferior tip of liver
  - Inferior pole of R kidney (R paracolic gutter)
    - Left side: 3 points
  - Subdiaphragmatic space (above spleen, below diaphragm)
  - Spleno-renal pouch
  - Inferior pole of L kidney (L paracolic gutter)
    - Pelvis: 1 point
  - Posterior to bladder (recto-vesicular pouch/recto-uterine pouch)
- Hydronephrosis: 5 clips
  - Each side: long-axis and short-axis clips of each kidney, fanning through the kidney to identify abnormalities
  - Colour Doppler if potential abnormalities are identified to distinguish normal renal vasculature from dilated renal pelvis
    - Bladder: 1 clip (transverse)