Hepatic Congestion

- [Article, VeXus Grading](#)

FREE Exam

Setup

- Enter patient information
- Attach EKG leads
- Select phased array transducer
- Choose ST UMMC 1 Echo preset

Parasternal long axis (PLAX)

- Qualitative EF assessment (CLIP)
- LVOT diameter (SAVE)
- PLAX, during end systole
- Inner edge to inner edge of aortic at base of aortic valve
- Normal 1.8-2.4 (~BSA, can use as surrogate if unable to measure)
- Color doppler over MV and AoV to look for regurgitation (CLIP)

Parasternal short axis (PSAX)

- Qualitative EF assessment at each level
- Level of papillary muscles (CLIP) - assess RV as well
- Level of mitral valve (CLIP)
- Level of aortic valve (CLIP)
- Color doppler over tricuspid to check for TR (CLIP)

Apical four chamber (A4C)

- Qualitative assessment of RV and LV size (CLIP)
- Color doppler over MV, LA, and LV (CLIP)
- Mitral inflow E-a (SAVE)
    - A4C, mitral valve, PW doppler just inside ventricle
    - Above baseline, measuring flow into the ventricle/towards the probe
    - E = early diastolic filling
    - A = late atrial kick
    - A is just before QRS, E is before A
    - E > A in normal and pseudonormal (super abnormal)
- Mitral annulus TDI (SAVE)
    - A4C, mitral valve, lateral annulus, TDI → PW
    - A' is just before QRS, E' is before A'
    - E' and E occur at the same time point in the cardiac cycle
    - Normal E/E' >10

- Color doppler over TV (CLIP)
- TR Vmax (SAVE)
  - A4C, CW doppler
  - Can also be done in PSAX, CW doppler, if visible at aortic valve level
  - Only if tricuspid regurgitation is present
  - Surrogate for RVSP/PASP (TR max PG = RVSP + CVP)

- TAPSE (SAVE)
  - A4C, tricuspid valve, lateral annulus, M-mode
  - Estimate visually before measuring
  - Measure peak to valley
  - RV specific, only free wall, no contribution from septum/LV
  - Normal >1.7

Apical five chamber (A5C)

- Collar doppler over LVOT and AoV (CLIP)
- LVOT VTI (SAVE)
  - A5C, aortic valve, PW doppler where LVOT diameter was measured
  - Quantitative surrogate for stroke volume (SV)
  - Trace largest flow away from probe, baseline to baseline
  - Normal 18-24 in euvolemia (approx. 10x BSA)
- Stroke volume variation (SAVE)
  - Using doppler saved for LVOT VTI, need at least 10 beats
  - Decrease sweep speed (25-35 mm/sec) to see multiple beats
  - Measure SV maximum and minimum flow
  - Cannot do in arrhythmia, not validated in low EF
- AoV Vmax
  - A5C, aortic valve, CW doppler
  - If AS, SVV measurement is invalidated
  - Normal <200

Subcostal (SC)

- Evaluate for pericardial effusion (CLIP)
- Oblique view with IVC (CLIP)
- IVC collapsibility (SAVE)
  - SC oblique, M-mode
  - If variability, measure max and min
- Hepatic vein
  - IVC view, PW doppler
  - Drains right atrium/IVC, transduces the pressures of the right side
  - Occurs between two QRS complexes
  - S = ventricular systole, actually seeing atrial diastole
  - D = ventricular diastole, actually seeing atrial systole
  - A = atrial kick, causes small reversal in pressure
- Portal vein
  - IVC view, PW doppler
  - Normal vein, should have continuous flow

  - "Pulsatility" or "to and fro" pattern = volume intolerance

Pulmonary

- Gen Abdomen preset
- 6 locations - upper, mid, and lower on left and right (CLIP x6)
- Evaluation for B lines
- Rating - (0) = absent, (1 zone) = scattered, (>2 zones) = diffuse

Internal Jugular veins (IJ)

- Linear probe, decrease depth to 5cm
- Measure at HOB 0 degrees and then HOB 90 degrees
- Only need one side