Protocol for Documentation for Educational Studies

1. DOCUMENT only what you see!
2. If you are unable to ascertain a view necessary for completion, DOCUMENT WHAT VIEW NOT OBTAINED due to “limited view”.
3. If you are unsure of a finding, USE GENERAL LANGUAGE such as *“no visible stones”* or *“no obvious right heart dilation”*
4. CONSIDER arrows or question marks for findings you believe to be pathology and ask your attending to review the image.
5. SAVE a still image of your interpretation for educational studies
6. CLEAN the probe
7. For ordered studies, find your study in QPATH and fill out the appropriate worksheet
8. Find something interesting during your US exam? Compare it with findings on https://www.thepocusatlas.com/

Aorta: Ruptured AAA/Dissection

Minimum 5 Views

1 Longitudinal + 4 Transverse Clips with Measurements

Negative Findings	- Normal Aortic Diameter **< 3cm** - Normal Iliac Arteries <1.5 cm after bifurcation - Pulsatile - No obvious false lumen
Positive Findings	- Moderate to Severely Enlarged/Dilated Aorta - *> 3cm = Moderate* - *> 5.5 cm = Severe* - *> 1.5 cm = dilated common iliac A.* - False Lumen/Flap
Additional Findings	- Intraluminal Thrombus - Tortuous Aorta - Saccular Aneurysm - Extraluminal Bleeding
Double Check!	- Measure from outer wall to outer wall - Be wary the cylinder tangent effect - If suspected rupture, look for hemoperitoneum with FAST

Basic Cardiac: **RV Strain, PC Effusion, + LV Function**

Minimum 2 Views

PLAX, PSAX, Apical 4, SubXY

Negative Findings	No obvious RV strain	Estimated normal EF	No obvious effusion
Positive Findings	RV Dilation (RV chamber basal diameter ≥ LV chamber basal diameter) D Sign TAPSE > *17mm* McConnel's Sign	Reduced EF (*EPSS > 6 mm* = Mild-Mod *EPSS > 12 mm* = Severe) Asystole	Trace-Severe Pericardial Effusion RA compression/RV diastolic collapse
Additional Findings	Thickened RV (*> 5mm)* wall Clot in transit Pacing Wire	Focal Wall Motion Abnormality Diastolic Dysfunction	Pleural Effusions
Double Check!	In PSAX, scan below mitral at level of papillary muscles	Bring the septum perpendicular to probe	Pleural Effusions will not be anterior to the descending Aorta

E-FAST: **Free Fluid, Pneumothorax**

6 Clips through entire view

2 Thoracic, 1 Cardiac, and 3 Abdominal views

Negative Findings	Positive bilateral lung sliding, no free fluid
Positive Findings	FF in Morrison's Pouch FF in LUQ FF in pelvis Pericardial Effusion/Tamponade Absent Lung Sliding
Additional Findings	RV strain with e/o PTX Seminal Vesicle (false positive)
Double Check!	View the liver tip in RUQ View superior aspect of spleen in LUQ Consider repeat E-FAST Scan most superior/anterior aspect of chest Consider lying supine for PTX evaluation

Gallbladder: Cholelithiasis/Cholecystitis

Minimum 3 Views

1 Transverse view + 1 Longitudinal View + 1 GB wall

(measure CBD in concern for cholecystitis/choledocholithiasis)

Negative Findings	- Normal GB wall - No Pericholecystic Fluid (PCCF) - No stones visualized - Neg Sonographic Murphy's - Edge artifact
Positive Findings	- GB Wall thickening >3-4mm - Sonographic Murphy's sign - Pos Pericholecystic Fluid - Visualized stone with posterior shadow - Dilated Common Bile Duct >5mm (add 1mm to ULN for each decade >50)
Additional Findings	- Emphysematous changes - Air artifact adjacent to portal triad (pneumobilia) - Gallbladder wall fold (phrygian cap) - WES (wall echo shadow) sign - GB polyp (immobile)
Double Check!	- Measure the anterior GB wall (not posterior wall due to acoustic enhancement) - Find the gallbladder neck - Measure CBD from inner to inner wall

Lower Extremity: **Deep Venous Thrombosis**

Minimum 4 Views

3 Transverse Clips of (Common Femoral, Saphenous Vein Take-Off, Deep Femoral Vein at Bifurcation, and Popliteal)

Negative Findings	- Compressible veins, No obvious DVT
Positive Findings	- Non-compressible section of vein - Hyperechoic material within vein
Additional Findings	- Phlegmasia Cerulea Doleans - Cobblestoning/Fluid collection - Air concerning for Necrotizing Fasciitis - Consider assessing augmentation/doppler
Double Check!	- Compress from the common femoral all the way down until you lose visualization of the vein - When positive, check the asymptomatic leg. - Common false positive: Baker's cysts, reactive lymph nodes, and superficial venous thrombi

Lung/Thoracic: **Pneumothorax/Effusion/Interstitial Pathology**

Minimum 6 Views

Each Hemithorax: 3 Zones (Anterior 2-3rd ICS, Axillary, Lateral Lung Base)

Negative Findings	+ Lung Sliding	A Line Dominant
Positive Findings	+ Lung Point Absent Lung Sliding	B Lines (confluent, diffuse, basilar) Positive Zone ≥ 3 B lines Pulmonary Edema ≥ 2 zones per hemithorax C Line Pleural Effusion
Additional Findings	Subpleural Consolidation Mirror Effect	Hepatization/Consolidation Jagged Pleura Spine Sign Static and Dynamic Air Bronchograms
Double Check!	Cardiac Motion can be mistaken for Lung Point Consider M-Mode	Look for Basilar pleural effusion elucidating spine sign Consider posterior view in Peds

Ocular: **FB, Vitreous Hem/Retinal Detachment, Incr. IOP**

Minimum 3 view (each eye)

Transverse/Longitudinal Views, Optic Nerve Measurement

Negative Findings	No Foreign Body	No Vitreous Detachment or Retinal Hemorrhage	Normal ONSD (*Optic Nerve Sheath Diameter*)
Positive Findings	Foreign Body seen	Hazy material in vitreous fluid Retinal Detachment seen	ONSD > 5mm (high sens, very low specificity)
Additional Findings	Consensual response from contralateral eye	Partial Retinal Detachment Lens dislocation	Papilledema (bulging of the Optic nerve; Optic Nerve Elevation)
Double Check!	Turn the gain down to see foreign body Avoid if Globe Rupture	Turn the gain all the way up to look for vitreous material	Average the measurement in 2 planes Measure 3mm posterior to retina

Renal/Bladder: **Hydronephrosis/Urinary Retention**

Minimum 6 Views

1 Longitudinal + 1 Transverse clip of each kidney

1 Longitudinal + 1 Transverse clip of bladder

(measure Bladder Vol = **L x W x H x 0.75** if concern for retention)

Negative Findings	- No Hydronephrosis - Physiologic Hydro - Bladder decompressed
Positive Findings	- Mild-Severe Hydronephrosis - PVR > 200 mL
Additional Findings	- Perinephric fluid collection - Renal Cyst/Mass - Intrarenal/UVJ/Bladder Stone - Ureteral Jets absent/present
Double Check!	- Cysts are found in the renal cortex - Always check contralateral kidney to differentiate physiologic from mild hydronephrosis