

ABDOMINAL DOPPLER ULTRASOUND PROTOCOL FOR PORTAL VEIN THROMBOSIS (UABDL AND UORGDL)

****THIS WILL BE AN ABDOMEN LIMITED EXAM AND LIMITED DOPPLER EXAM WITH COLOR AND SPECTRAL DOPPLER EVALUATION OF THE PORTAL VEINS, PORTAL CONFLUENCE, AND SPLENIC VEIN. IT WILL NOT INCLUDE HEPATIC ARTERIES OR HEPATIC VEINS****

****SEE SEPARATE PROTOCOL FOR FULL ABDOMINAL DOPPLER, EVALUATION OF TIPS, PORTAL HYPERTENSION AND PRE-LIVER TRANSPLANT EVAL.****

PATIENT PREP: NPO at least 4 hours. Exceptions can be made for urgent and ER exams. Include in the report that the patient was not NPO for exam when relevant.

PANCREAS:

- Transverse image of head, body (showing splenic vein) and tail.
- Sagittal image of head, body and tail.
- Transverse image of head showing porto-splenic confluence.
- Document and measure pancreatic duct if visible.
- Take image of "Pancreas Area" if not well seen.

LIVER:

Left lobe – subcostal/epigastric approach

- Transverse images:
 - Left hepatic vein confluence into IVC
 - Left lobe visualizing dome of liver
 - Left lobe with left portal vein
 - Cine clip sweeping through LHL in transverse from superior to inferior
- Sagittal images:
 - Left lobe with left portal vein and ligamentum teres.
 - Left lobe with hepatic vein
 - Cine clip sweeping through LHL in sagittal from medial to lateral

Caudate lobe – subcostal/epigastric approach

- Sagittal image of the caudate lobe.
- Transverse image of the caudate lobe.

Right lobe - subcostal or intercostal approach

- Sagittal images:
 - Right lobe to visualize dome of liver
 - Right liver with middle hepatic vein draining into IVC
 - Main interlobar fissure with gallbladder and CHD and MPV
 - Right lobe and right portal vein.
 - Right hemidiaphragm to assess for pleural effusions and ringdown.
 - Right lobe showing echo texture between liver and right kidney.
 - Right lobe and right kidney documenting approximate liver size. Measurement of length of the liver is not needed unless requested.
 - Cine clip sweeping through RHL in sagittal from medial to lateral
- Transverse images:
 - Right lobe showing right and middle hepatic veins.
 - Right lobe at right portal vein.
 - 2D image through MPV
 - COLOR image of MPV showing patency and direction of flow
 - Right lobe and right kidney.
 - Cine clip sweeping through RHL in transverse from superior to inferior

LIVER CAPSULE -FOR HCC SCREENING ONLY

- Image of contour of liver capsule taken with linear transducer to assess for nodularity, preferably of the left lobe.

COLOR DOPPLER IMAGES- (Be sure to optimize your color image.)

- Color and 2D images of MPV, Right PV and Left PV showing direction of flow and any filling defects.
- Color and 2D images of the MPV down to the portal confluence.
- Color and 2D images of the RPV anterior and posterior branches as distal as possible.
- Color and 2D images of the LPV as distal as possible.
- Color image of the splenic vein and SMV at the pancreas showing direction of flow.
- Color image documenting any collateral or varies if present in periportal area, LUQ, epigastric region, or the presence of a recanalized umbilical vein.

SPECTRAL DOPPLER IMAGES: (Be sure to optimize your spectral doppler images.)

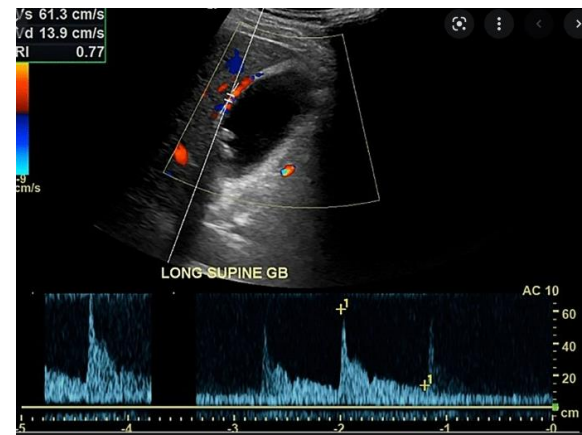
- Main, Right and Left Portal Veins - angle corrected velocity measurement.
 - MPV velocity is usually between 30-60cm/s, velocities less than <10cm/s indicate portal hypertension.
- Splenic vein at splenic hilum - angle corrected velocity measurement.

BILE DUCTS:

- Sagittal image of CBD and CHD with and without measurements in 2D and color doppler at the level of the porta hepatis. If dilated, follow CBD as distal as possible to look for stones/mass and measure as distal as possible as well.
- Document and measure any intrahepatic bile duct dilatation with 2D and color imaging.

GALLBLADDER:

- Sagittal image of gallbladder.
- Transverse image of gallbladder.
- Measurement of gallbladder wall in sagittal section only. Do not include liver surface. If liver edge is edematous, try to measure free GB wall. Normal wall thickness is <3mm.
- Take image and cine through GB if there is any abnormality (stones, polyp, adenomyomatosis.) Take color image of any mass seen.
- LLD POSITION: Transverse and sagittal image of gallbladder with patient in LLD position to check for stones/polyps and mobility.
- If evaluating for cholecystitis, or if suspicious GB findings such as thickened wall or distension:
 - Evaluate for Murphy's sign and include in the report.
 - Gallbladder length measurement. Normal <8cm
 - Color doppler of gallbladder wall to assess for hypervascularity
 - Spectral doppler velocity of the cystic artery which can be seen within wall of anterior gallbladder.
 - Normal velocity <40cm/s
 - If artery cannot be visualized, include color doppler of area and comment in report that it could not be seen.
 - Add code UORGDL if cystic artery is sampled.



RIGHT KIDNEY:

- Sagittal image of right kidney in medial, middle and lateral views.
- Sagittal measurement of right kidney. Take cine only if abnormality is present.
- Transverse images of superior/mid/inferior right kidney.
- Color Doppler image of any mass or pelviectasis.

SPLEEN:

- Sagittal and transverse images through spleen
- Sagittal length measurement of spleen
- Sagittal image through left hemidiaphragm and spleen to assess for pleural effusions and ringdown.
- Sagittal image through spleen and left kidney.
- Color Doppler image of any abnormality.

LOWER QUADRANTS:

- Document RLQ and LLQ (to check for ascites).

NOTES-

1. If a patient is coming in for pain, please document within the indication section or the "other" section what the current status of pain is. For instance, how long the patient has had pain, if it's getting worse or better, and where exactly the pain is. Always take an image where the patient is hurting the most (label as "area of pain"). If this area is located where bowel is, take an image of the area with a linear transducer. When describing the pain, write "per patient, ..." in the indication. Example: Per the patient, his pain is now in the RLQ and getting worse.
2. Cine clip of any abnormality.
3. Say "Not well seen" if structure is not well seen and include the reason why.
4. Any masses, cysts, stones or abnormalities should be measured in three dimensions and have a 2D picture and a color image documented.

PVT ABDOMINAL DOPPLER PROTOCOL HISTORY

	Date	Changes made	By whom
Created	03/03/22	Created separate protocol	Renee Betit Fitzgerald
Updated	10/25/21		Becky Marion
Updated	03/03/22	-Added color of SV at pancreas -Added Spectral of SV at hilum -Removed pelvis/bladder area images -Changed NPO requirement to 4 hrs	03/03/22 Protocol Meeting Attendees (Dighe, Lee, Kolokythas) (Document updated by Renee Betit Fitz)
Approved	03/14/22		Manjiri Dighe
Added	10/27/202	-Cine clips of RHL and LHL in Trv and Sag -Cystic artery and GB length if ruling out cholecystitis	Renee B Fitz