ULTRASOUND PROTOCOLS

Abdomen Complete Ultrasound

Indication	Cirrhosis or hepatic disease, Fluid collections, Gallstones, Metastatic disease, Obstructive symptoms of the biliary system, Aortic aneurysm, Pancreatitis, Hypertensive renal disease, Renal transplant, Mid-abdominal trauma, Abnormal diagnostic tests, Pain, Additional indications may be used following ICD guideline
Prep	Patient should be NPO
Procedure	1. AORTA: a. In sagittal, view the proximal, mid, and distal aorta. Then transverse views documenting AP and transverse measurements. 2. PANCREAS: a. Place the transducer just below the xiphoid process and use the left lobe of the liver as an acoustic window. View the long axis of the body of the pancreas. The image should be oriented obliquely, as dictated by the patient anatomy, to show as much of the entire pancreatic anatomy as possible. Also identify the pancreas head, uncinate process, and tail. b. Check pancreatic duct for dilatation and measure the diameter if dilated. c. Include the superior mesenteric vein when viewing the pancreatic head, as well as the distal common bile duct. d. Document the pancreatic tail. Check peripancreatic region for adenopathy, and/or fluid. e. If bowel gas obstructs the view, administration of water may be helpful. Also, patient can hold breath to optimize visualization. 3. LIVER: a. In sagittal, start midline and scan lateral (left of the patient), demonstrating the left lobe of the liver and its parenchyma, as well as the aorta, and body of the pancreas. b. Scan back to midline, then angle to the right to visualize the right lobe of the liver, including the position of the IVC where it passes through the liver. Identify the main portal vein, common bile duct, and hepatic artery. Demonstrate as much of the dome of the liver as possible (adjacent to the diaphragm), the right hemidiaphragm, and right pleural space. Measure cephalo-caudal length of liver in the midclavicular line. Compare the echogenicity of the liver next to a longitudinal view of the right kidney and check for fluid in Morrison's Pouch. c. Go back to midline and in transverse visualize the left lobe of the liver. At the cephalic margin of the liver demonstrate the confluence of the hepatic veins. d. Continue angling left to view the left lobe with the left portal vein. e. Move back to midline then scan toward the right visualizing the dome of the liver, portal vein, hepatic veins, and liver kidney interface. f. The liver is best examined during held inspiration to bring it beneath the costal margin. 4. RIGHT KIDNEY:

a. In sagittal, visualize the right kidney in long axis to r/o hydronephrosis or masses. A maximum measurement of renal length should be documented. In transverse, visualize superior, mid, and inferior poles of the right kidney. Measure in the greatest transverse diameter.

5. GALLBLADDER AND BILIARY TRACT:
   a. In sagittal with the patient in a supine position, view the gallbladder including the fundus, body and neck portions.
   b. In transverse, do the same as above.
   c. Change the patient's position to right lateral decubitus, left lateral decubitus, and view gallbladder in both longitudinal and transverse directions to evaluate the gallbladder and its surrounding areas thoroughly, especially if stones or sludge are observed.
   d. Examine the gallbladder wall thickness, with measurements. Test for abdominal tenderness by applying transducer compression to help confirm pathology (Murphy's sign).
6. CBD:
   a. Identify CBD in its longitudinal dimension, documenting the proximal portions of the common bile duct. Measure the intraluminal diameter at its widest point.
   b. In its longitudinal dimension, identify the distal portion of the common bile duct to include the pancreatic portion.
   c. If calculi are identified in the gallbladder, careful examination of the ducts and pancreas should be made.
   d. In transverse, identify the pancreatic head and the common bile duct.
7. Main Portal Vein:
   a. Identify Main Portal Vein in its longitudinal dimension. Measure the intraluminal diameter at its widest point.
   b. Obtain color flow images to document flow
8. SPLEEN:
   a. Move the transducer to the left of the pancreatic tail and view the spleen in long axis and transverse demonstrating the splenic parenchyma.
   b. Include splenic hilus, if possible. Putting the patient in left decubitus may be helpful.
   c. Doppler may be used to determine the presence and direction of flow in the splenic vein and artery.
   d. Splenic enlargement should be documented by measurement.
9. LEFT KIDNEY:
   a. Angle transducer medially and scan throughout the left kidney in long axis to rule out hydronephrosis or masses. A maximum measurement of renal length should be documented. Compare echogenicity of left kidney and spleen. In transverse, visualize superior, mid, and inferior poles of left kidney. Measure in the greatest transverse diameter.
10. IVC:
    a. Obtain color flow images to document flow