

# **RUQ (“Limited”) ABDOMINAL SONOGRAM**

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## Recommended transducer(s):

GE 700: 3.5 or 5 MHz curved linear probe, 365MC aka AMA, VIP or  
("Toaster") probe, 546L linear probe  
Acuson Sequoia: 4Cl or 4VI and 7L  
GE Logiq 9: 3.5 curved, 4 sector

The liver parenchyma should be evaluated for focal and/or diffuse abnormalities. The echogenicity of the liver should be compared to the pancreas. The length of the right lobe should be measured. Often, the liver and portal veins (especially the left) are better seen in the left lateral decubitus position. Doppler evaluation may be needed to differentiate vascular & non-vascular structures.

Routine gallbladder evaluation should be performed in a fasting state (i.e. 8 hrs or more of NPO). The gallbladder is evaluated for distention, filling defects and wall thickening. Examining the patient in the left lateral decubitus or upright position may be needed for further evaluation of the gallbladder. If acute cholecystitis is suspected, focal tenderness over the gallbladder should be documented (annotated on the image).

The intra and extrahepatic biliary ducts should be evaluated for dilation. The entire common duct needs to be evaluated if visible.

If seen, the entire pancreas should be evaluated for its dimension, echogenicity and masses. If seen the pancreatic duct should be evaluated for dilatation and any other abnormalities. The peri-pancreatic region should be evaluated for adenopathy and abnormal fluid collections.

The right kidney should be measured and evaluated for the presence of hydronephrosis. The echogenicity of the renal cortex should be compared to the liver. Though it is not necessary to document all routine images (see "RENAL SONOGRAM" protocol), the entire right kidney should be examined on the real time survey for any pathology.

## **Images:**

Longitudinal Left lobe of the liver, left of the midline.

Left lobe of the liver at the midline. Image the proximal abdominal aorta with the celiac artery and SMA (if seen). Survey the entire aorta in patients over 60 years old.

Left lobe liver with IVC. Include the caudate lobe and MPV. If not obscured by bowel gas, the pancreatic head can be seen in this plane. Angle the transducer

caudally to image the entire head of the pancreas.

Liver with left portal vein. In patients with portal hypertension evaluate the area around the ligamentum Teres to detect the presence of a dilated paraumbilical vein.

Right lobe liver with gallbladder.

Gallbladder. Take at least two representative images (include separate images with "GB setting" if needed)

Right lobe liver with longitudinal dimension. Measure between the dome and tip of the right lobe, parallel to the body axis. If the liver is larger than the sector width, for accuracy use compound measurement (split image) or the "panoramic" view (Acuson).

Right lobe liver with right kidney -compare echogenicity and measure renal length.

Right lobe liver "far lateral". Survey the liver as far lateral as possible.

Transverse

Transverse Dome of the liver with the hepatic veins as landmarks. Include the **entire** left and right lobe of the liver. Generally separate images for each lobe is needed.

Liver with the left portal vein. **Survey the area** of the vein to exclude biliary ductal dilatation. If seen include an image of the normal duct. Include the entire liver, both left and right lobes. Take separate images if needed.

Main portal vein bifurcation. If seen, measure diameter of CHD.

Right lobe of liver with the right portal vein. **Survey the area** of the vein to exclude biliary ductal dilatation. If seen include an image of the normal duct.

Right lobe of liver With main portal vein. Right lobe of liver with gallbladder.

Gallbladder at the neck, mid body and near the fundus. Use "gallbladder setting" if needed. Measure wall thickness.

Right lobe of liver with right kidney Right lobe of liver near tip

Pancreas-include the entire head, body and tail. Measure the pancreatic duct if visualized.

LLD position

In this position the liver, gallbladder and right kidney often shift towards the midline, making them more accessible for scanning. This position is especially helpful if these organs are positioned "high" underneath the rib cage. It also facilitates intercostal scanning of the posterior part of the liver.

If a gallbladder "soft tissue" filling defect is found, evaluate its mobility in the LLD position, to differentiate between a polyp and inspissated bile ("sludge ball"). If a gallstone is suspected but none is found in the supine position, evaluate the gallbladder in the LLD position. Remember to survey the dependant part of the gallbladder (point the transducer to the floor).

The common duct in most patients is best seen in this position. Due to anatomic variations, the optimal scanning angle to image the duct may vary from patient to patient. The common duct should be imaged at its largest diameter and measured from the inner to inner walls at the following three levels: at the main portal vein bifurcation, in the porta hepatis at the right hepatic artery crossing and posterior to the pancreatic head. In imaging the common duct, an attempt should be made to image the longest segment possible. The largest diameter of the common ducts should be documented.

If the head of the pancreas is not completely seen in the supine position, following the common duct inferiorly often leads to this structure.

**Notes:** Always include the entire organ in the representative images. For example, if in the sagittal view the right lobe of the liver is longer than the sector width, take two separate images, one including the hepatic dome and another with the liver tip.

If hepatic cirrhosis is suspected, evaluate the liver with an 8 MHz (or higher) linearprobe, for any surface nodularity. To eliminate rib shadowing, scan the right lobe with the transducer oriented parallel to it. Position the patient in the left lateral decubitus position, with the right arm stretched over the head. Deep inspiration further expand the intercostal spaces, facilitating the exam. Survey the entire liver surface carefully. In the early stages of cirrhosis the nodules may only be present in parts of the liver.