



Sonographer Scanning Cheat Sheet: Abdominal US

Procedure Overview: An abdominal ultrasound can be utilized to evaluate the aorta, inferior vena cava, pancreas, liver, gallbladder, common bile duct, bilateral kidneys, and spleen to detect the presence, severity, and location of abdominal pathology.

Required Pre-Procedure Prep:

- NPO for 8 hours (recommended but not required).
- Obtain patient verbal consent.
- Obtain patient history including but not limited to symptoms and previous abdominal surgery.
- Instruct patient to lie supine, right lateral decubitus, and/or left lateral decubitus.

Proper Probe: Convex or sector probe with a frequency of 2.5 - 5 MHz that has tri-duplex capabilities.

Protocol for Abdominal Ultrasound (76700)

This protocol aligns with the Mindray I-Works protocol: Imagen Abdomen Complete

You may "Suspend" the protocol at any time to take additional images or handle pathology, then restart I-Works.

*****Document pathology with and without measurement in two planes, Sag and Trv measuring the length, height, & width. Be sure to also include images with and without color Doppler.***

*****If evaluating for Cirrhosis, please add additional images using the Linear probe to assess Liver Contour.***

Cine Clips should be taken to help prove pathology and provide context for Remote Radiologists when appropriate. Please be mindful of not taking too many cine clips, just show what's most important.



ABDOMEN COMPLETE:

1. Prox IVC
2. Prox IVC with A/P measurement
3. Prox Aorta Sag (above the SMA)
4. Prox Aorta Sag with A/P measurements (be sure to INCLUDE WALL in measurement)
5. Mid Aorta Sag (between SMA and Renal Arteries)
6. Mid Aorta Sag with A/P measurements (be sure to INCLUDE WALL in measurement)
7. Distal Aorta Sag
8. Distal Aorta Sag with A/P measurements (be sure to INCLUDE WALL in measurement) *(note: If any level of the Aorta is dilated, suspend protocol and take additional images and measurements in TRV and with color)*
9. Long Pancreas Head/Body
10. Long Pancreas w/Color over Head/Body (measure pancreatic duct if visualized, look for “shotgun” sign)
11. Long Pancreas Head/Body w/measurements
12. Long Pancreas Body/Tail
13. Long Pancreas Tail w/measurement
14. Pancreas SAG image of Head
15. Lt Liver Sag to lateral left border
16. Lt Liver Sag to Mid portion (include inferior margin and aorta)
17. Lt Liver Sag medial portion (include diaphragm, IVC and caudate lobe)
18. Lt Liver TRV superior border
19. Lt Liver TRV mid portion (including left portal vein)
20. Lt Liver TRV inferior (include caudate lobe)
21. Rt Liver Sag showing dome (angled up toward patients right shoulder, no vascularity should be seen in this dome image)
22. Rt Liver Sag angling medially from dome
23. Rt Liver Sag angling medially again showing right renal for comparison
24. R Liver Sag Measurement (at level of kidney comparison)
***If cirrhotic-appearing liver or if a history of cirrhosis is given, switch to linear probe, suspend protocol, and take additional images focusing on liver nodularity and contour.*
25. Rt Liver Sag (including GB and portal vein)
26. Rt Liver TRV dome (angling up and lateral toward patient right shoulder, no vascularity should be seen in this dome image)
27. Rt Liver TRV mid portion (showing portal vein branches)
28. Rt Liver TRV (including gallbladder)
29. Rt Liver TRV (showing hepatic veins)
30. Rt Liver TRV (showing Main Portal Vein)
31. Rt Liver TRV MPV w/Color (go from side through ribs to best show MPV coming up into liver)
32. Rt Liver TRV, MPV w/Doppler
33. Rt Liver TRV inferior (at level of kidney comparison)
34. Sag GB supine Fundus
***IF GB removed, document GB fossa and include comment regarding when removed. Other GB images can be skipped in the protocol.*
35. Sag GB Supine Body
36. Sag GB Supine Neck



37. TRV GB Fundus
38. TRV GB Body fanning medially
39. TRV GB Body fanning laterally
40. TRV GB Neck
41. GB LLD Sag Fundus
42. GB LLD Sag Body/Neck, add comment for Murphy Sign Yes or No
43. GB LLD Trv Fundus
44. GB LLD TRV Body
45. GB LLD Trv Body w/ measurement of anterior wall thickness (measurement should be of the anterior wall interface w/liver at thinnest portion. Note: an oblique angle can cause false thickening of the wall and exaggerated measurement)
46. GB LLD Trv Neck
47. CBD (stretched out over portal vein)
48. CBD w/color
49. CBD w/measurement
50. Rt Kidney Sag Mid
51. Rt Kidney Sag Mid with measurements (length and height, & Cortex)
52. Rt Kidney Sag Mid Add COLOR (adjust color scale or PRF to show good perfusion)
53. Rt Kidney Sag Medial
54. Rt Kidney Sag Lateral
55. Rt Kidney TRV Mid
56. Rt Kidney TRV Mid w/measurement (width)
57. Rt Kidney TRV Mid w/color flow over hilum
58. Rt Kidney TRV Upper Pole
59. Rt Kidney TRV Lower Pole
60. Lt Kidney Sag Mid
61. Lt Kidney Sag Mid with measurements (length and height, & Cortex)
62. Lt Kidney Sag Mid Add COLOR (adjust color scale or PRF to show good perfusion)
63. Lt Kidney Sag Medial
64. Lt Kidney Sag Lateral
65. Lt Kidney TRV Mid
66. Lt Kidney TRV Mid w/measurement (width)
67. Lt Kidney TRV Mid w/color flow over hilum
68. Lt Kidney TRV Upper Pole
69. Lt Kidney TRV Lower Pole
70. Spleen Sag
71. Spleen Sag w/Color
72. Spleen Sag w/measurement (length and height)
73. Spleen TRV
74. Spleen TRV w/measurement (width)

*****Report any findings on your Comment section in the Report page on the machine using proper sonographic terminology.***



Anatomy	Normal Measurements
Liver	<16 cm mid clavicular line
Pancreas	Head <3.5 cm
Gallbladder Anterior Wall	<3 mm
Abdominal Aorta	<3 cm
CBD	<0.60 cm; If GB removed, < 1.0 cm
Kidney	9-13 cm females to 10-14 cm males
Spleen	<13 cm
Portal Vein	<13 mm



Common Pathology

- AAA: Aortic Aneurysm. Dilatation of aorta beyond 3 cm. Be sure to include the wall in your measurements.
- Simple Fatty Liver Infiltration: Appears as attenuation of the liver parenchyma. Typically presents as increased echogenicity of hepatic parenchyma appearing brighter than the surrounding renal tissue with decreased visualization of the intrahepatic vessels and diaphragm.
- Steatohepatitis: Appears similar to fatty liver with hepatomegaly. Commonly presented as isoechoic to echogenic liver parenchyma with decreased visualization of the intrahepatic vessels and diaphragm. Steatohepatitis is the second stage of liver disease progression.
- Fibrosis: Appears as hypoechoic, coarse liver parenchyma with hepatomegaly and decreased visualization of intrahepatic vessels and diaphragm. Fibrosis is the third stage of fatty liver disease progression and requires a biopsy for diagnosis, but tissue elastography aids in diagnosing.
- Liver Cysts: Commonly present as anechoic lesions with well defined borders and posterior enhancement artifact. Document the location and cyst classification as simple or complex.
- Cirrhosis: Presents as a shrunken liver with a nodular surface and round edges. Ascites is often present. Cirrhosis is the fourth stage of liver disease progression and is irreversible.
- Cholelithiasis: Presents as the presence of gallstones which appear as echogenic foci with posterior shadowing. Turn the patient in LLD to see if the stones are mobile. Cholecystitis is present when the anterior gallbladder wall measures >3 mm and the patient is symptomatic. Gallstones are the most common cause of cholecystitis.
- Choledocholithiasis: Presents as the presence of gallstones within the common bile duct or head of pancreatic duct. The CBD will be dilated beyond .60cm when stones are in duct.
- Hepatosplenomegaly: Presents an enlarged liver measuring over 16 cm and enlarged spleen measuring over 13 cm. Evaluate the splenic hilum for varices.
- Nephrolithiasis: Presents as an echogenic foci with posterior shadowing artifact. Document the nodule's location and if it is non-obstructing or obstructing in nature.
- Renal Cysts: Commonly present as hypoechoic lesions with well defined borders and posterior enhancement artifact. Document the location and cyst classification as simple or complex.
- Hydronephrosis: Appears as a dilated fluid filled renal pelvis. Confirm by verifying the absence of blood flow through power Doppler evaluation. If hydro is seen, you should also assess the bladder. Check for patent ureteral jets w/color flow, dilated distal ureters, and/or incidental bladder masses or stone. Following bladder images, direct the patient to empty his/her bladder and examine the renal pelvis post void to rule out pseudo-hydronephrosis.
- Renal Carcinoma: Appears with a taller-than-wider presentation, microcalcifications, irregular borders, and internal vascularity. Most commonly located on the left side.