

Upper Abdomen Ultrasound Protocol

The following organs should be examined in a systematic fashion with each organ visualised in the longitudinal and transverse planes.

Liver

Position, size, shape and echo texture of the liver parenchyma should be assessed. Any irregularities recorded and the echo texture in comparison to the right kidney observed and documented. The liver capsule should be identified and assessed for any irregularity. The CBD should be measured – inner-to-inner when it passes over the hepatic artery. The intra-hepatic ducts and CBD should be examined for any signs of dilatation. The hepatic veins should be assessed for any dilatation. The portal vein should be assessed with Doppler when appropriate and clinically indicated.

In cases of suspected liver disease; the size, echotexture, echogenicity and contours of the liver should be noted. Focal lesions and direction of flow in the portal vein should be documented. Comment on any ascites, recanalization of the umbilical vein, nodularity and spleen size. If there are previous studies, comment on any changes. Focal lesions are highly suspicious of hepatoma and should be treated as urgent.

In cases of jaundice it is essential to determine whether the cause is obstructive or non-obstructive. If there is no biliary dilatation, this is non-obstructive. With biliary dilatation every effort should be made to determine whether the obstruction is intrahepatic or extra-hepatic, gallstones or tumour related. With obstructive jaundice, please comment on whether the patient is tender upon scanning.

Haemangioma

Liver lesions which are uniformly echogenic, diffusely hyperechoic and without mass effect can be confidently called a haemangioma regardless of size in patients who are not suspected of having a malignance or liver disease. Refer to haemangioma flowchart.

HCC surveillance

Refer to HCC surveillance flowchart.

CBD

The CBD should be measured where it passes over the hepatic artery in the LS plane. 1mm for each decade of life, is considered within normal limits. However, this measurement can be considered normal up to 10mm in older patients and those that have had a cholecystectomy.

If possible identify the cause of the dilatation.

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Try to visualise the entire CBD to rule out focal dilation, a stone or a mobile stone causing intermittent pain but perhaps no dilation.

Gallbladder

Size, shape should be assessed. The gallbladder wall thickness should be observed and recorded if thickened (>3mm). The gallbladder neck should be closely examined for the presence of any calculi, sludge or polyps. The gallbladder should be echo free with any calculi producing an acoustic shadow. The patient's position should be altered to evaluate layering and motion of any calculi.

GB Polyps

Gall bladder polyps are not an unusual finding (approximately 5% of population) and should be noted in the report. Refer to gallbladder polyp flowchart.

Pancreas

Shape, size and echo texture should be observed and documented. The pancreatic duct should be assessed for dilatation (pancreatic duct increases in calibre with age) with a measurement >4mm considered abnormal in all patients. Any inhomogeneity, calcification or masses should be recorded and discussed as well as any adjacent free fluid, collections or lymphadenopathy.

Spleen

Shape, size and echo texture should be observed and documented. A splenic measurement should be made in the longitudinal section along the longest axis of the spleen (13cm and above considered enlarged). The splenic capsule should be assessed for any irregularities. The splenic parenchyma should be compared to that of the left kidney.

Kidneys

Presence and position of both kidneys should be observed. The motion of both kidneys should be observed. If a kidney is not within the renal fossa, then check for its location elsewhere.

Renal size should be documented on the image with a measurement taken in the longitudinal section between the two renal poles. Any discrepancy in size between the two kidneys exceeding 2cm should be noted. Eg. "L > R"

The renal cortex and medulla should be assessed and any alteration in echogenicity documented.

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If there appears to be hydronephrosis with a full bladder then the patient should be rescanned with an empty bladder.
Complex renal cysts should be discussed at the Urological MDT meeting regards future imaging.

Angiomyolipomas

Cortically based echogenic renal lesions measuring less than 1 cm are likely incidental angiomyolipomas. Refer to AML flowchart.

Aorta

The size and shape of the aorta should be assessed.
If the aorta is of normal calibre a measurement can be taken in the longitudinal section.
Any tortuosity, calcification or atheroma should be documented.
If an aneurysm is detected this should be measured at its widest point in the transverse plane with the callipers placed on the inner walls of the aorta and aneurysm (AP direction). The bifurcation and common iliac arteries should be assessed.

ROUTINE RECORDED IMAGES

- 1 x Aorta Longitudinal
- 1 x Pancreas (Head, Body and Tail)
- 1 x Left lobe of LIVER Transverse
- 1 x Left lobe of LIVER Sagittal
- 1 x Gallbladder (Supine)
- 1 x Gallbladder (Decubitus)
- 1 x CBD (including measurement)
- 1 x Right lobe of LIVER Sagittal
- 1 x Right lobe of LIVER Transverse
- 1 x Right Kidney Longitudinal (including measurement)
- 1 x Right Kidney Transverse
- 1 x Left Kidney Longitudinal (including measurement)
- 1 x Left Kidney Transverse
- 1 x Spleen (including measurement)

A routine abdominal ultrasound examination would therefore have a total **14 images**. Images should be recorded on PACS of any pathology seen, in addition to this set of routine images.

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Specific Upper Abdomen Ultrasound Protocol

Aorta

The aorta should be measured and assessed throughout its length in the longitudinal and transverse section.

Images of the proximal, mid and distal aorta should be recorded.

The aorta should be measured at its widest point in the transverse section measuring inner wall to inner wall (AP direction).

Assess and document the bifurcation and common iliac arteries.

If an aneurysm is detected, a measurement > 3 cm this should be measured at its widest point in the transverse plane with the callipers placed on the inner wall of the aorta and aneurysm. Any thrombus should be documented. The bifurcation and common iliac arteries should be assessed. The location of the aneurysm should be documented i.e. proximal, mid, distal or iliac.

Both kidneys should be assessed for renal size.

Please refer to the flow chart no. 1 below.

Aortic Aneurysm Follow Up

The examination should be performed following the general protocol.

The size and shape of the known aneurysm should be compared to the previous examination.

The report should document any change and the time frame in which it has occurred.

A < 0.5 cm change is not considered significant. If there is an increase greater > 1 cm this should be reported as significant change. Please refer to the flow chart no. 1 below.

The common iliac arteries should be visualised and checked for dilatation.

Both kidneys should be assessed for renal size.

Renal Ultrasound

The bladder should be assessed using the harmonic setting. The bladder wall should be assessed for irregularity (wall thickness >4 mm in the distended bladder). Bladder volume should be assessed post micturition when indicated especially in cases of urinary tract infection or retention.

Comment should be made if a patient has problems filling their bladder or emptying their bladder.

A residual bladder volume of >100 mls is considered significant and should be recorded.

The kidneys should be assessed following the general protocol. If there appears to be hydronephrosis with a full bladder then the patient should be rescanned with an empty bladder.

In male patients only image the prostate if it is abnormal i.e. large or irregular in outline.

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In female patients only image the uterus and ovaries if they are abnormal or are indicated on the request form.

The aorta should be assessed using the aorta protocol in all patients.

Complex renal cysts and angiomyolipomas should be referred to a Urologist by the GP.

See angiomyolipoma protocol.

AAA Flowchart 1

<i>3 – 4.4cm</i>	<i>Vascular opinion</i>	<i>Suggest 1 year Follow up</i>
<i>4.5 – 5.4cm</i>	<i>Vascular opinion</i>	<i>Suggest 3 month Follow up</i>
<i>5.5 -7cm</i>	<i>GP urgent Vasc consultant referral</i>	<i>Any back pain go to A&E</i>
<i>>7cm</i>	<i>Ring patient GP to check if this is a known or new finding</i>	<i>Any back pain go to A&E</i>
	<i>If a new finding ring the nearest Hospital with a vascular service</i>	<i>Request the on call Vascular Reg – ask for advice re: ambulance</i>

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