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Guidelines, Policies and Statements

Guidelines for Abdominal Ultrasound Examination

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1. Introduction

1.1. Statement

A general examination of the abdomen is conducted to detect alternate causes for the presenting of patient signs and symptoms. However, ultrasonic investigation of the abdomen is usually conducted to answer a specific clinical question. For example, *are there gallstones? Is the prominent aortic pulsation due to aneurysm? Is there evidence of parenchymal liver disease? Why is the liver function test deranged?*

The survey of the abdomen is usually restricted to the upper abdominal organs. Ultrasound examination of the lower abdomen should be obtained if directed by the respective individual, departmental or organisational protocol.

1.2. Purpose

Sonography is a valid and helpful diagnostic tool for evaluating structures and condition in the abdominal region[1]. These guidelines are intended to establish minimum criteria for standard of care and to assist ultrasound practitioners in the conduct of ultrasound procedures. They set out the expectations for the performance of abdominal ultrasound examinations to facilitate the provision of high quality and effective ultrasound imaging.

1.3. Scope/Applicability

These guidelines apply to all ultrasound practitioners. They are directed towards the normal range of pathology expected in adults.

They may be used as a general guide when examining children and infants, provided that appropriate allowance is made for the anatomical differences between adults and children.

Providers are encouraged to be accredited in accordance with their local legislative requirements. In Australia, accreditation with the Diagnostic Imaging Accreditation Scheme (DIAS) ensures safety and quality standards for diagnostic imaging practices.

2. Pre-Performance of Ultrasound

Any normal arrangements undertaken for patient screening, referral and background profile. The patient has been advised regarding any preparation or special dietary restrictions beforehand.

3. Equipment

Equipment for abdominal ultrasound examination should be high quality real-time apparatus, meeting the Diagnostic Imaging Accreditation Scheme's (DIAS) Practice Accreditation Standards for Capital Sensitivity.

Broadband curved linear and sector transducers with variable focal zones are preferred. The frequency should be in the 2-8 MHz range.

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4. The Examination

When assessing a particular organ in the abdomen with ultrasound, the organ should be thoroughly scanned from one border to the other, in a minimum of two orthogonal planes. Archived images are obtained in standard planes to document a normal study, and specific views are taken to illustrate detected pathology.

When an abnormality is found, the following basic sonography rules apply:

- Quantify abnormality in two planes,
- Assess echogenicity, borders, echotexture and vascularity/hemodynamics.

5. The Pancreas

5.1. Pancreas Requirements

Transverse and longitudinal ultrasound examination is required, particularly of the head, body, tail and uncinate process.

5.2. Pancreas Report

As a minimum, the following should be assessed:

1. The degree of visualisation particularly if suboptimal.
2. Parenchymal texture.
3. Focal lesions; including soft tissue masses, cysts and calcification.
4. Pancreatic duct; calibre, contour and stones. Assess CBD size at pancreatic head.
5. Peripancreatic lesions; collections, solid masses, lymphadenopathy and cysts.

6. The Gall Bladder

6.1. Gall Bladder Requirements

- Demonstrate in at least two planes, with patient in supine or decubitus position.
- To assess mobility of gall bladder lesion or findings, with the patient in erect position.

6.2. Gall Bladder Report

As a minimum, the following should be assessed:

1. Intraluminal lesions; number, size, posterior shadowing, mobility and echogenicity.
2. Wall thickness (versus degree of distension) or mass; assess wall continuity posterior to mass and presence of vascularity.
3. Presence of mural gas, mural oedema, calcification or comet tail artifact.
4. Distension; physiological and pathological.
5. Point tenderness with probe pressure and release.
6. Pericholecystic collections/echogenicity changes e.g. “fatty sparing”.

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7. The Extrahepatic Bile Duct

7.1. Bile Duct Requirements

Attempt to demonstrate the full length of the common bile duct and common hepatic duct.

7.2. Bile Duct Report

As a minimum, the following should be assessed:

1. Duct diameter; luminal measurement, at level of portal vein bifurcation (MHD) and more distally (CBD). If there is duct dilatation – degree and extent of dilatation, level of obstruction, regularity of caliber, assess for duct wall thickness.
2. Intraluminal lesions; number, size, echogenicity, posterior shadowing and mobility within duct. If solid luminal contents – assess for wall disruption and/or vascularity of mass.

8. The Liver

8.1. Liver Requirements

Longitudinal and transverse views are usually sufficient. Intercostal views may be required in the technically difficult patient.

8.2. Liver Report

As a minimum, the following should be assessed:

1. Adequacy of visualisation of the whole of the liver.
2. Overall size and contour/size changes due to mass/surgery.
3. Borders/Liver surface; smooth or irregular. If irregular, macro- or micro-nodular cirrhosis.
4. Parenchymal echogenicity, texture and attenuation.
5. Focal lesions; number, size, location echo characteristics and segmental location required.
6. Intrahepatic bile ducts.
7. Hepatic and Portal veins; size, patency and hemodynamics (direction and velocity of flow in PV).
8. Perihepatic collections.
9. Right pleural space.

9. The Spleen

9.1. Spleen Requirements

Measure size (indicate plane used).

9.2. Spleen Report

As a minimum, the following should be assessed:

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1. Parenchyma; texture and echogenicity, vascularity post trauma or with abnormality.
2. Focal lesions; number, size, location, echo characteristics and presence of splenunculus.
3. Perisplenic collections, collateral veins, splenic vein patency and direction of flow.
4. Left pleural space.

10. The Kidneys

10.1. Kidney Requirements

Measure size; measure bipolar distance.

10.2. Kidney Report

As a minimum, the following should be assessed:

1. Contour.
2. Parenchyma; echogenicity cortex and medulla, and cortico-medullary differentiation.
3. Focal masses; number, size, location, cystic or solid, vascularity and exclude invasion into renal vein.
4. Collecting systems; hydronephrosis, prominent extrarenal pelvis, dilated ureter, intraluminal lesions, urothelial thickening and exclude focal nephronia/pyonephrosis in UTIs.
5. Perirenal and pararenal collections and masses

11. The Adrenal Glands

11.1. Adrenal Gland Requirements

Visualisation should be attempted. However, the adrenal glands are not usually seen in the adult age group.

11.2. Adrenal Gland Report

As a minimum, the following should be assessed:

1. Size and texture if enlarged.
2. Focal masses; cystic, solid, bilateral, unilateral and vascularity.

12. The Upper Abdominal Vasculature

12.1. Upper Abdominal Vasculature Requirements

The degree of ultrasonic interrogation of the upper abdominal vasculature undertaken in a standard abdominal scan will depend on the clinical indication for the scan. For example, examination of all of the other intra-abdominal vessels would be considered as reserved for a dedicated abdominal vascular study/renal artery study.

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12.2. Upper Abdominal Vasculature Report

The following vessel should be visualised, and assessed for patency and haemodynamics as clinically indicated and included in the report:

1. Aorta; exclude aneurysm, atherosclerosis, para-aortic lymphadenopathy and confirm patency.

13. The Aorta

13.1. Aorta Requirement

Size; measure the outer AP diameter of the aorta as per departmental protocol (State if obtained in the transverse or longitudinal plane) (Males: < 3cm NAD; Females: < 2.5 cm).

13.2. Aorta Report

As a minimum, the following should be assessed:

1. Aneurysmal dilatation and patency.
2. Calcification, plaques and thrombus.
3. Para-aortic masses; size number location.

14. The Peritoneal Cavity

The appendix is not routinely examined. The bowel wall is also not routinely examined, but it is considered good practice to scan the bowel and comment on any abnormality (if detected); thickness, dilatation, peristalsis and identify gut layer involved in abnormality– i.e. mucosal/mural etc.

14.1. Peritoneal Cavity Requirements

1. Confirm/exclude ascites; comment on maximum depth of collection.

14.2. Peritoneal Cavity Report

As a minimum, the following should be assessed:

1. Loculated collections; size, site, echo characteristics and vascularity.
2. Peritoneal masses; size, vascularity and site.

15. Related and Supporting Documents

The following documents are required to give effect to these guidelines:

- ASUM Guidelines for Reprocessing Ultrasound Transducers.

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16. References

The following documents inform these Guidelines:

1. American Institute of Ultrasound Medicine. AIUM Practice Parameter for the Performance of an Ultrasound Examination of the Abdomen and/or Retroperitoneum. 2017. Available from: http://www.aium.org/resources/guidelines/abdominal.pdf
2. Australian Government Department of Health. Diagnostic Imaging Accreditation Scheme Practice Accreditation Standards (DIAS). Available from: https://www.health.gov.au/internet/main/publishing.nsf/Content/diagnosticimaging-accred2
3. Australian Government Department of Health. 2017. Equipment, Medicare and diagnostic imaging. Available from http://www.health.gov.au/capitalsensitivity
4. ASUM discussion paper: Definition of Point of Care Ultrasound (POCUS).

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