Renal Ultrasound Protocol

Specific staff groups to whom this policy directly applies	Likely frequency of use	Other staff who may need to be familiar with policy
Sonographers	Daily	Health Care Assistants

Main Author(s)	Louise Wilcox (Clinical Lead)
	Karl Sturtridge
Date of Approval	1/11/25
Next Review	1/11/27

Purpose	To ensure the imaging and reporting of normal and renal tract are optimally undertaken by ultrasound practitioners, with clear guidance for the referrer where needed.

Contents

1. Purpose

- To ensure all patients undergoing ultrasound examination of the renal tract are appropriately imaged with reports that answer the clinical question.

- To ensure all abdominal organs are examined in a minimum of two planes, i.e. longitudinal section (LS) and transverse section (TS), with additional views as required.

- To ensure age-related appearances and normal variants are recognised.

2. Best Practice

- Sonographers recognise and work within their personal scope of practice, seeking advice from Senior Sonographer, if needed. If there is no sonographer available, please use Soliton, to message and ask for a 2nd opinion.

- Sonographers should follow the locally agreed protocols, working with reference to national and local practice and guideline recommendations.

- As advanced and autonomous practitioners, the examination should be performed according to the clinical presentation. The emphasis of examination may be altered according to the clinical scenario, previous imaging findings and patient history.

- Sonographers are responsible for arranging follow up scans by sending a message to admin /office team on Soliton.

3. General Examination

- Patients should arrive with a full bladder having drunk two pints of water at least an hour previously.

- Correctly identify the patient by checking the date of birth and address against examination request.

- Explain procedure and ensure the Patient has adequate understanding to obtain informed consent.

- Use interpreters where necessary if Patient does not understand procedure due to language difficulties.

- Read the request carefully and may be supplemented by asking the Patient a few questions, particularly if the information supplied is inadequate.

- If the Patient has had prior ultrasound or radiological examinations, check any relevant reports prior to examination.

4. Guidelines for the examination of organs (BMUS)

Bladder	• 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). • LS and TS of the bladder when full. • Bladder volume should be assessed pre and post micturition (and recorded in report) 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. • If male, LS and TS of prostate and state if enlarged and irregular and protrudes into bladder. • A residual bladder volume of >150mls is considered significant and should be recorded.
Kidneys	• Follow general protocol for assessment. Assessment should be made of the size, shape, position and orientation, outline and ultrasound characteristics of cortex, medulla, collecting system. • 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. • If there appears to be hydronephrosis with a full

	bladder then the patient should be rescanned with an empty bladder.
	Hydronephrosis • If present with a full bladder, then the patient should be rescanned with an empty bladder. • In female patients image the uterus and ovaries if they are abnormal or are indicated on the request form.
	Renal cysts • should be documented and assessed for complexity (simple, septated, complex – see Appendix) • More complex renal cysts require formal Bosniak grading with either CEUS or CT (referral to MDT/urologist)
	Angiomyolipomas • Homogeneous echogenic renal lesions in cortex, measuring <1 cm - no routine follow up. • Lesions >1cm but <3 cm – follow up scan at 6 months to ensure the lesion has not grown. • Lesions >3cms – referral to MDT/urologist • See Full Appendix

5. Recording Images

- Images are recorded on PACS. If PACS is down, record images on hard drive of machine and ensure images are transferred when system working again.

- Images should support the written report and include any abnormalities.

6. Recommended Images

- Ideally, patient should be examined in supine and decubitus positions
- LS (in midline) and TS of bladder with volume measurement pre and post micturition.
- LS and TS of prostate (if male)
- LS of Right Kidney comparing parenchyma with right lobe liver.
- LS images of both Kidneys including bipolar measurements.
- 3 Transverse images through each kidney (upper, mid and lower pole), one of which should be at renal pelvis.
- The aorta should be assessed using the aorta protocol in all patients.

7. Examination Report.

- All examinations require a written report on the Soliton. All reports need to be verified.
- The written report should be concise, clear and easily understood and should address the clinical question.
- Include any relevant surgery or medical history ie. Cholecystectomy, nephrectomy,
- If the examination is limited this should be stated in the report i.e. suboptimal views due to increased BMI, obscured by bowel gas etc
- If the examination cannot be completed, for example if the patient has not starved for a gallbladder scan, rebook the Patient ensuring they understand reasons for preparation compliance. Document this in report.

- The written report should be verified by the Sonographer undertaking the examination unless a 2nd opinion is required by a Senior Sonographer or needs Consultant review. Please add the 2nd sonographer on the report and select in box.
- For consultant review select in Edit box at bottom of report.

- Significant and unexpected Findings and Urgent referral - see Policy

8. References

Incidental Findings General Medical Ultrasound Examinations: Management and Diagnostic Pathways Guidance Incidental_Findings_complete_Q52C9Tf.pdf (bmus.org) 2020 BMUS guidance pages. Guidance Pages | BMUS

Herms E, et al. Ultrasound-based "CEUS-Bosniak" classification for cystic renal lesios:an 8-year clinical experience. World J Urol. 2022; 20:41 (3):679 -685 https://pmc.ncbi.nlm.nih.gov/articles/PMC10082702/

Halpenny D, Snow A, McNeill G, Torreggiani W. The Radiological Diagnosis and Treatment of Renal Angiomy olipoma-current status. Clin Radiol.2010; 65(2):99-10

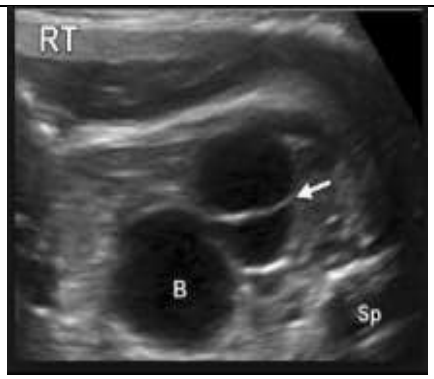
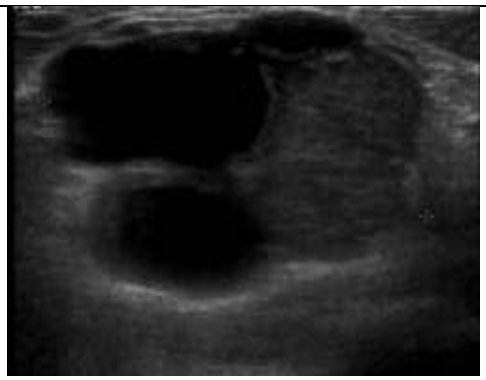
Rini B, Campbell S, Escudier B. Renal Cell Carcinoma. The Lancet. 2009:373:1119-32

Tublin M, Thurston W, Wilson S. The Kidney and Urinary Tract, in Diagnostic Ultrasound (vol.1).

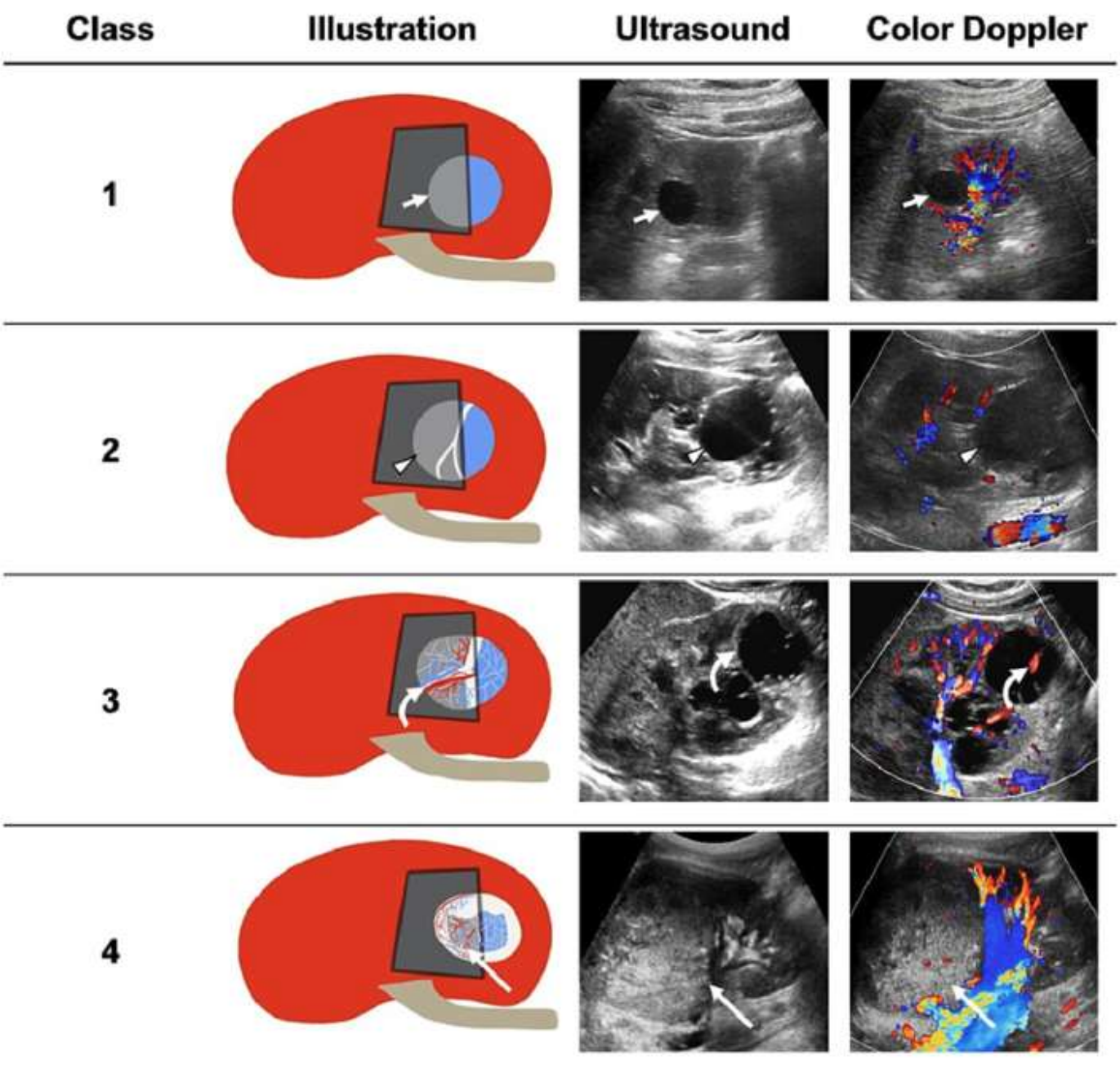
Hussein T et al, Can subcentimetre ultrasound detected angiomyolipomas be safely disregarded? Clinical Radiolo gy. 2020;

Sidhar K, McGahan JP, Early HM, Corwin M, Fananapazir G, Gerscovich EO. Renal Cell Carcinomas: Sonographic Appearance Depending on Size and Histologic Type. J Ultrasound Med. 2016;35(2):311–320. doi:10.7863/ultra.15.0305

Appendix 1: Renal Cysts Images

Simple Renal Cyst	Renal Cyst with 1 Single Thin Septation	Complicated Renal Cyst
		
- Anechoic - Thin walled - Posterior acoustic enhancement	- Anechoic - One thin septation - No calcification - No PMH of malignancy	- Irregular outline - Thick wall - Internal septations - Echogenic material
Document number of cysts, size, appearance and location in report	Document size, appearance and location in report	Document size, appearance and location in report
No follow up is required	No follow up is required	Report as significant and unexpected and suggest referral to MDT/Urology.

Appendix 2: Bosniak Classification



Modified Bosniak classification illustration mBosniak class 1, simple cyst with no flow in color Doppler (short arrows). mBosniak class 2, smooth wall and minimally complex thin septations with no flow in color Doppler (arrowheads). mBosniak class 3, thick or irregular septations with flow in color Doppler (curved arrows). mBosniak class 4, Solid or nodular component or thick irregular wall with flow in color Doppler (long arrows). Abbreviations: mBosniak, modified Bosniak Illustration created by the author MA.