



PHILIPS

Ultrasound

Quick guide

Focused renal ultrasound

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The more you see, the more you can do

Flank pain is a common presentation in the emergency department (ED). Focused renal ultrasound is useful when evaluating patients for obstructive uropathy whether due to urolithiasis, urinary retention, or other less common etiologies. Focused renal ultrasound done at the bedside provides immediate information and does not expose patients to ionizing radiation.

Focused renal ultrasound

Patient positioning and transducer selection

- The patient is typically positioned in a supine position, but may be rolled into a lateral decubitus position if preferred.
 - A low-frequency curvilinear transducer's wider field of view and improved tissue penetration facilitates identification of relevant structures. Alternatively, a low-frequency phased array transducer can also be used.
- Tip:** placing the transducer more posteriorly (using either a lateral decubitus or upright seated position) may improve renal imaging in some cases.

Examination technique – right kidney

- To visualize the right kidney in a longitudinal plane, place the transducer in the right mid-to-anterior axillary line in a longitudinal orientation with the directional indicator oriented towards the patient's head (Figure 1a).
- The normal right kidney will have an hypoechoic cortex containing the renal pyramids and an hyperechoic pelvis (Figure 1b). Be sure to fan the transducer antero-posteriorly to evaluate the entire kidney.
- Obtain a short-axis view of the kidney by rotating the directional indicator down towards the gurney. Be sure to slide and/or fan cephalad/caudad to evaluate the entire kidney (Figures 2a-2b).



Figure 1a



Figure 1b



Figure 2a



Figure 2b

Focused renal ultrasound

Examination technique – left kidney

- To visualize the left kidney in a longitudinal plane, place the



Figure 3

transducer in the left posterior axillary line in a longitudinal orientation with the directional indicator oriented towards the patient's head. Be sure to fan the transducer antero-posteriorly to evaluate the entire kidney (Figure 3).

- Obtain a short-axis view of the kidney by rotating the directional indicator up towards the ceiling. Be sure to slide and/or fan cephalad/caudad to evaluate the entire kidney.

Hydronephrosis

- Hydronephrosis is recognized by coalescent anechoic foci within the renal calyces and dilation of the renal pelvis (Figure 4a).



Figure 4a

- The degree of hydronephrosis can range from mild to severe, with progressive thinning of the renal cortex as the severity of obstruction increases (Figure 4b).

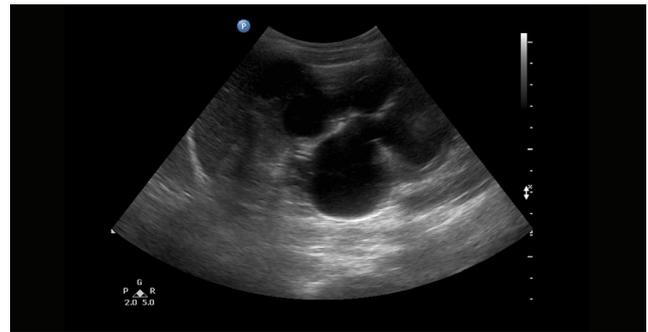


Figure 4b

Renal cyst

- Renal cysts are common and often easily visualized during focused ultrasound exams. As opposed to hydronephrosis, renal cysts are typically round, well-demarcated, and arise from the renal cortex.



Figure 5

Focused renal ultrasound

Examination technique – bladder

- If hydronephrosis is present, especially bilaterally, evaluation of the bladder is recommended to identify urinary retention as a potential cause.
- To visualize the bladder in a longitudinal plane, place the transducer just above the pubic symphysis in a longitudinal orientation with the directional indicator oriented towards the patient's head (Figures 6a-6b). Be sure to fan the transducer right and left to evaluate the entire bladder.
- Obtain a transverse view by rotating the directional indicator to the patient's right. Be sure to slide and/or fan cephalad/caudad to evaluate the entire bladder (Figures 7a-7b).



Figure 6a



Figure 6b



Figure 7a

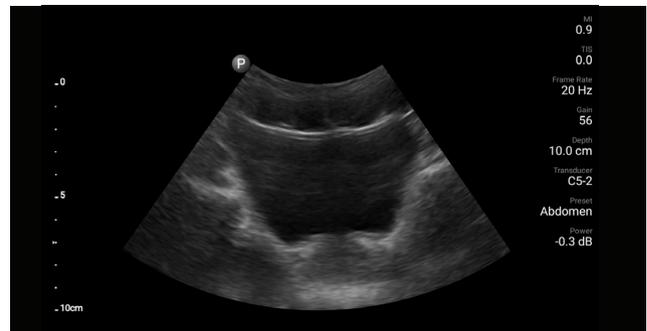


Figure 7b

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