

# ULTRASOUND PROTOCOLS



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## Renal Ultrasound

<b>Indication</b>	Mets, hypertensive renal disease, renal transplant, mid-abdominal trauma, abnormal diagnostic tests, pain, additional indications may be used following ICD guidelines
<b>Prep</b>	Patient supine
<b>Procedure</b>	<p><b>PROCEDURE FOR RENAL ULTRASOUND:</b></p> <ol style="list-style-type: none"> <li>1) With the patient in a supine position, apply ultrasound gel to the patient’s abdomen region (RUQ).</li> <li>2) Begin by imaging the right kidney using the liver as an acoustic window. View the long axis of the right kidney demonstrating the central echo complex and renal cortex. Include the right lobe of the liver to compare echogenicity of the kidney to the liver.</li> <li>3) In sagittal, measure the right kidney’s long axis from greatest cephalocaudal length.</li> <li>4) In transverse, view the right kidney through the superior, mid, and inferior poles. Measure the greatest diameters transverse and AP.</li> <li>5) Doppler arcuate arteries superior, mid, and lower pole to obtain RI’s.</li> <li>6) Apply ultrasound gel to the patient’s left upper quadrant of the abdomen. Using the spleen as an acoustic window, view the long axis of the left kidney, demonstrating the central echo complex and renal cortex. Include the spleen to compare echogenicity of the kidney to the spleen from the greatest cephalocaudal length, and AP diameter through the renal hilum.</li> <li>7) In transverse view the left kidney through the superior, mid, and inferior poles. Measure the greatest diameters transverse and AP.</li> <li>8) When possible, images of the distended urinary bladder and its wall should be obtained. A full bladder technique allows visualization of the ureteral-bladder junction and the urinary bladder. The bladder wall thickness and focal lesions should be noted. Dilatation or other distal ureteral abnormalities should be documented.</li> <li>9) View the bladder in both transverse and sagittal planes taking measurement for bladder volume.</li> <li>10) Have patient empty bladder and then document bladder volume for post void residual.</li> </ol> <p><b>EVALUATION AND DIAGNOSTIC CRITERIA:</b> Real-time and Doppler evaluation and documentation, when indicated, should include but not be limited to:</p> <p><b>KIDNEY</b></p> <ol style="list-style-type: none"> <li>A. Size and shape</li> <li>B. Echogenicity</li> <li>C. Perirenal fluid collection</li> <li>D. Hydronephrosis</li> <li>E. Renal calculi</li> <li>F. Mass - Location, size, cystic or solid</li> </ol>

## **URINARY BLADDER AND ADJACENT STRUCTURES**

- A. Size and Shape
- B. Wall thickness (> 3mm indicates pathology)
- C. Calculi
- D. Clots
- E. Dilatation or other distal ureteral abnormalities
- F. Post void residual
- G. Out pouching of bladder wall

## **SIMPLE VS. SOLID MASS**

- a) Simple Cyst
  - i) Anechoic
  - ii) Good acoustic enhancement
  - iii) Thin, well-defined cyst wall
  - iv) Spherical shape
- b) Solid Mass
  - i) Internal echoes (echoic)
  - ii) Lack of acoustic enhancement
  - iii) Poorly defined far wall
- c) Doppler/Color Doppler should include but not be limited to:
  - iv) The presence or absence of blood flow:
    - a) Internal in mass
    - b) External to mass
    - c) Laminar flow patterns
    - d) Normal vascularity
    - e) Turbulence and Mosaics

## **VENOUS DOPPLER** - may be performed on the following sites

- a) Renal Veins
  - i) Constant forward velocity with slight variations by respiration
  - ii) Directional (Forward flow)
  - iii) Absence or presence of flow
  - iv) Highlighted color for clot

## **ARTERIAL DOPPLER** - may be performed on the following sites:

- a) Renal Arteries
  - i) Low resistance flow pattern
  - ii) Stenosis