



## ULTRASOUND

- Modality of choice for renal imaging. [1,2](#)
- Routine use is not indicated. [2,3](#)
- Provides morphological and functional information useful for the diagnosis and management of specific pathological conditions leading to acute renal failure. [1,2](#)
- Helps differentiate potentially reversible acute renal failure from chronic end-stage renal disease. [1,2](#)

- Allows detection of obstruction, assessment of renal size and outline. [4](#)
- Renal size is usually normal in prerenal acute renal failure and it may increase in acute renal diseases such as acute tubular necrosis, interstitial nephritis and acute glomerular nephritis. Reduced size suggests a complicated underlying chronic nephropathy and worse prognosis. [1](#)
- Limitations: [1,2](#)
  - Poor specificity.
  - False negatives may occur in early renal obstruction and in dehydrated patients.

## DIFFERENTIAL DIAGNOSIS BASED ON SIZE AND CONTOUR OF KIDNEYS

- Smooth, Small Kidneys:
  - chronic glomerulonephritis
  - renovascular cause
  - post-obstructive atrophy
- Scarred, Small Kidneys:
  - chronic pyelonephritis
  - tuberculosis
  - papillary necrosis
- Normal Sized or Large Kidneys:
  - polycystic kidneys
  - renal vein thrombosis
  - infiltration
  - acute tubular necrosis

## PERCUTANEOUS NEPHROSTOMY

- Percutaneous nephrostomy is performed as a temporary means of urinary diversion.
- A nephrostogram allows assessment of the level of obstruction and may also determine the cause
- If indicated, antegrade ureteric stenting can be performed through the nephrostomy tract.

## RENAL VESSEL DOPPLER ULTRASOUND

- Doppler gives information regarding blood flow velocities and waveform.
- 63-100% sensitivity and 73-100% specificity for renal artery stenosis. [10](#)
- Doppler ultrasound can be used to distinguish renal obstruction from non-obstructive dilatation. A renal resistive index (RI) of 0.7 or less in the presence of dilatation of collecting system is supportive evidence of absence of functionally significant obstruction. [4-6](#)

- A renal resistive index value of at least 0.8 reliably identifies patients with renal-artery stenosis in whom angioplasty or surgery will not improve renal function, blood pressure, or kidney survival. [11](#)
- Patients with abnormal US or high clinical suspicion of renal artery stenosis need to be further evaluated with MRA or CTA. [12,13](#)
- Advantages: non-invasive, relatively inexpensive, does not involve the use contrast material and no exposure to ionising radiation.
- Limitations: difficult in obese patients and where breath holding and cooperation are poor. [14](#)

## ANGIOGRAPHY

- Catheter or CT angiography involves use of iodinated contrast medium, which is usually contraindicated in acute renal failure. MR angiography is a useful alternative in these circumstances.

## RENAL BIOPSY

- When the cause of declining renal function is not found and the clinical features are atypical of acute tubular necrosis, renal biopsy may be used to exclude potentially treatable conditions such as Wegener's granulomatosis, systemic lupus erythematosus, Goodpasture's syndrome or rapidly progressive glomerulonephritis.

## NUCLEAR RENAL SCAN

- Renal perfusion, filtration and excretion can be evaluated which are helpful in determining the potential for salvage. [7-9](#)
- There are no comprehensive series describing DTPA or MAG3 renography in patients with acute renal failure and no evidence that serial renography contributes more to patient management than does the measurement of urine volume and creatinine content. [9](#)

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#### Website

For more information go to [www.imagingpathways.health.wa.gov.au](http://www.imagingpathways.health.wa.gov.au)

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