

TRA Locations

TRA Corporate Center Campus
TRA Gig Harbor
TRA Lakewood
TRA Olympia - on Lilly

TRA Tacoma - on Cedar
TRA Tacoma - on Union
TRA Tacoma - on Hilltop
TRA at Tumwater Family Practice

Affiliated Centers

Carol Milgard Breast Center
Medical Imaging on 1st
Union Avenue Open MRI

Renal Artery Duplex Ultrasound Protocol

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Indications

Indications for renal artery duplex include, but are not limited to:

1. Evaluation of patients with hypertension, particularly when there is a moderate to high suspicion of renovascular hypertension (for example, uncontrolled hypertension despite optimal therapy, hypertension with progressive decline in renal function, progressive decline in renal function associated with ACE inhibition therapy, abrupt onset of hypertension).
2. Follow-up of patients with known renovascular disease who have undergone renal artery stents placement or other renal artery intervention or have a known unilateral stenosis with concern for a stenosis in the contralateral kidney.
3. Evaluation of an abdominal or flank bruit.
4. Evaluation of a suspected vascular abnormality such as an aneurysm, pseudoaneurysm, arteriovenous malformation, or arteriovenous fistula.
5. Evaluation of renal insufficiency in a patient at risk for renovascular disease.
6. Evaluation of renal artery blood flow in patients with known aortic dissection, trauma, or other abnormalities that may compromise blood flow to the kidneys.
7. Evaluation of discrepant renal size.
8. Concern for aortic or renal artery orifice thrombus in infants who have or have had an aortic catheter, such as an umbilical artery catheter.

There are no absolute contraindications to performing this examination.

Required Images

The study is generally performed for both kidneys. If not, the report should state the reason for unilateral study (e.g., evaluation of renal stent, known for solitary kidney).

The study consists of gray scale imaging of the kidneys with spectral and color Doppler of the extrarenal and intrarenal vessels.

Grayscale Imaging

- The longest renal length should be measured and reported.
- In patients who have not had recent cross-sectional imaging of the kidneys, a complete renal ultrasound examination may be considered. See the ACR–AIUM–SPR–SRU Practice Parameter for the Performance of an Ultrasound Examination of the Abdomen and/or Retroperitoneum.

Spectral and Color Doppler Evaluation

- Analysis of main renal artery and intrarenal arterial waveforms should be used to evaluate for renal artery stenosis.
- Careful attention to technique is important to ensure accurate examination results, including selecting a transducer that is appropriate for the patient’s body habitus, optimizing color Doppler parameters, using an appropriate sample volume, optimizing the velocity scale for the size of the waveform to avoid aliasing (this may require adjusting the scale, baseline, or frequency, or selecting a lower frequency transducer), and using the lowest feasible angle of insonation.
- Angle correction is essential for determining blood-flow velocity. The angle between the direction of flowing blood and the applied Doppler ultrasound signal should not exceed 60 degrees.

Main renal artery evaluation

- The entire main renal artery should be scanned along its long axis using optimized color Doppler parameters. Occasionally, power Doppler or grayscale imaging may be necessary to localize a portion of the artery. Inability to visualize the entire or part (especially the origin) of the main renal artery should be reported.
- Spectral Doppler should be performed along the vessel’s length from the origin to the hilum at the lowest feasible angle of insonation.
- The greatest peak systolic velocities should be recorded at the origin/proximal portion, at mid aspect, and near the hilum. A peak systolic velocity should also be recorded at any site of color aliasing or suspected stenosis. If there is a significant

stenosis, a Doppler waveform should be recorded within the stenosis and distal to the stenosis.