

Renal Artery Guidance

Understanding the Exam

The renal artery is a blood vessel that branches off from the abdominal aorta. It carries oxygenated blood from the heart to the kidneys. Renal artery ultrasounds produce images that are used to look for blockages or narrowed blood vessels. They may also be used to monitor existing renal artery disease.

Doctors may order a renal ultrasound for patients with high blood pressure, abdominal bruit (vascular murmur heard through a stethoscope), or previous kidney problems.

The exam typically lasts around 45 - 60 minutes.

Performing and Approving Users

| | | Required Credentials | Common Additional Credentials |
|---------------------|----------------------|---|--|
| Performed by | Vascular Sonographer | One of the following: <ul style="list-style-type: none"> • RVT (Registered Vascular technologist) • RVS (Registered Vascular Specialist) • RPhS (Registered Phlebology Sonographer) • RDMS (Registered for Diagnostic Medical Sonography) | <ul style="list-style-type: none"> • Registered Diagnostic Cardiac Sonographer (RDCS): Certified by the American Registry for Diagnostic Medical Sonography (ARDMS) • Registered Cardiac Sonographer (RCS): Certified by Cardiovascular Credentialing International (CCI) • Cardiac-Interventional Radiography RT(CI) • Vascular-Interventional Radiography RT(VI) |

| | | | |
|----------------|-------------|--|--|
| | | | <ul style="list-style-type: none"> Cardiovascular-Interventional Radiography RT(CV) |
| Read by | Radiologist | ABR (American Board of Radiology) certified radiologists hold certifications in DR (diagnostic radiology) or IR/DR (interventional radiology/diagnostic radiology) | |

Facility Types

This type of study is performed in these facility types:

- Community hospitals
- Outpatient imaging centers
- Public health facilities
- University-affiliated teaching hospitals and medical institutions
- Government and private research institutes
- Private physician offices
- Mobile imaging providers

Worksheet

Configuration

Allows you to select the vessels you want to comment on for the exam. Also allows you to choose the Observation and Measurement columns you want on the worksheet.

[MyChoice form options](#)

- Define default configuration for the worksheet.

Measurements and Observations

Right and Left Tabs

- Techs record measurements from the scans of the left and right renal arteries.
- Contains fields for velocity, acceleration index/time, and kidney dimensions.

MyChoice form options

- Set a normal range for the Resistivity Index or use the Studycast default.

Other Tab

- Techs record measurements of the abdominal aorta and note any abnormalities on the kidneys.

MyChoice form options

- Can activate a drop-down in the abdominal aorta section to comment on plaque.
- Select measurement fields to include in the abdominal aorta section.

Report

Reports are designed to meet requirements from

- **SVU:** Society for Vascular Ultrasound
- **IAC-vascular:** Intersocietal Accreditation commission
- **ACR:** American College of Radiology
- **AIUM:** American Institute of Ultrasound in Medicine

Demo Path

Let's start with a quick orientation to the worksheet.

On the Right and Left tabs, you can document the PSV and EDV for the renal artery, cortex, and medulla.

The worksheet automatically calculates the renal artery ratio and resistivity index.

Below are fields for documenting the acceleration index, acceleration time, and velocity for the upper-mid-lower pole and hilum.

And below that are fields for documenting the kidney dimensions and volume, whether there's an accessory renal artery, and renal vein patency.

On the Other tab, you can document the celiac and mesenteric arteries, as well as the abdominal aorta.

Below that, you can document cysts, masses, calculus, and fluid.

What you document in these tabs will be reflected in the findings, and a summary of the abnormalities will be documented in the conclusions.

Example

Left Kidney

- PSVs/EDVs
 - Prox Renal Artery 144/48.1
 - Mid Renal Artery 170/61.1
 - Dist Renal Artery 125/48.2
- Cortex 310/210
- Medulla-mid 54/16.5
- Kidney length 10 cm, AP 5 cm
- Renal Vein Patency: Yes

Other Tab

- Prox Abd Aorta PSV: 72
- Mid abd Aorta PSV 68

Open the report and note that it includes a summary of the measurements, findings, and conclusions.

Now, if you'd like to include images in the report, you can do that from the Report Images tab. The studies images run along the left side, and you can scroll through and select the ones you want to include in the report. You also have the option to set the number of images on each page, with the Select layout dropdown.

Now, let's take a deeper look at how various observations affect how the findings are generated. As we do that, I want to point out the Configuration window. The worksheet has a default configuration chosen by your facility, but let's say you have a case that requires you to document something differently. You can change the configuration of the worksheet for just this one study by using the Configuration window.

Demonstrate how to set the configuration for a vessel vs. segments of the vessel.

When the worksheet calculates the renal artery ratio, if you've got a single value for the renal artery, and a single value for the abdominal aorta, then those values will be used to calculate the ratio. But if you're documenting the velocity by segment, then the maximum velocity is used to calculate the ratio. Enter values to demonstrate this calculation.

The velocities and the renal artery ratio are key drivers of the findings statements. If all of your peak systolic velocities are below 180, and the ratio is less than 3.5, then you'll get the statement, "No evidence of increased velocities in the right/left renal artery." But if one of the velocities is above 180, then you'll see that "increased velocities are noted" in the findings. [Now change the Mid Renal Artery PSV to 185 and regenerate findings to show this change.]

For the vascularity statement that's generated based on the resistivity index, if the index is between .2 and .7, you'll get a statement that there's no evidence of increased renal vascular resistance. If it's below the normal range, then you'll get a statement that there's increased resistance. [Change Cortex EDV to 28. You will see the Cortex RI recalculate, generate to update findings.] These statements are generated automatically, so the tech should not be surprised to see them when they first open the worksheet.

NOTE: The vascularity statement is not generated if the patient is under 18 years old.

Down toward the bottom of the Right and Left tabs, we've got the kidney dimensions. If the renal length value is greater than 8, the findings will include the statement that renal length is within normal limits. If the length is less than 8, OR if the difference between the right and left kidney lengths is 3 or more, then you won't get the statement that they are within normal limits.

For the conclusions, if there are no velocities above 180, and the ratios for left and right are less than 3.5, you'll see a statement that there is no evidence of renal artery occlusive disease. If any of the renal artery PSVs is above 180, you'll get a statement noting hemodynamically significant stenosis. If the ratio is 3.5 or higher, you'll get a statement noting hemodynamically significant stenosis due to decreased velocity in the abdominal aorta.