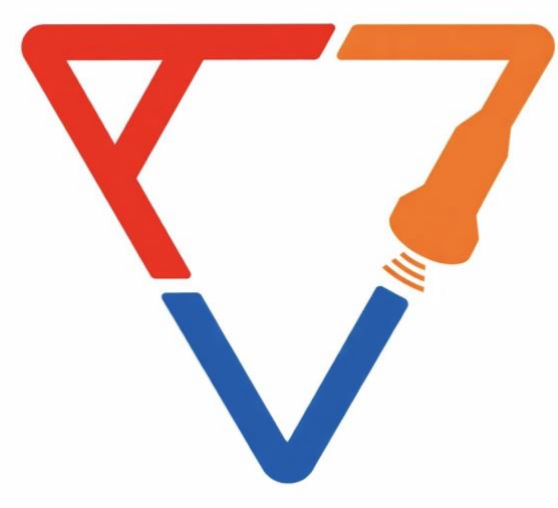
Renal Doppler Ultrasound Scan



ARTERY AND VEIN DIAGNOSTICS

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Patient Information

1. Understanding Renal Artery Disease

The kidneys play a vital role in filtering waste, regulating blood pressure, and maintaining fluid and electrolyte balance. Each kidney receives blood through a **renal artery**, which branches from the abdominal aorta.

When these arteries become narrowed — a condition known as **renal artery stenosis (RAS)** — blood flow to the kidneys is reduced. This can lead to:

- Difficult-to-control high blood pressure
- Reduced kidney function
- Fluid retention
- Long-term kidney damage

A **renal artery Doppler ultrasound** is a non-invasive test that assesses blood flow to the kidneys and helps identify narrowing, blockages, or other abnormalities.

1.1 Causes of Renal Artery Disease

Renal artery disease may occur due to several conditions that affect the structure or function of the renal arteries.

Atherosclerosis (Most Common)

- Plaque build-up in the renal arteries
- More common in older adults
- Often associated with high blood pressure, diabetes, smoking, and high cholesterol

Fibromuscular Dysplasia (FMD)

- A non-atherosclerotic, non-inflammatory condition affecting the artery wall
- Causes abnormal cell growth leading to narrowing, beading, or aneurysm formation
- More common in younger women
- May affect one or both renal arteries
- Can cause high blood pressure that is difficult to control

Renal Artery Aneurysm

- A bulging or dilation of the renal artery wall
- May be associated with FMD, atherosclerosis, trauma, or congenital weakness
- Often asymptomatic and found incidentally
- Important to monitor, as large aneurysms may pose a risk of rupture or reduced kidney blood flow
- May require specialist review depending on size, symptoms, or pregnancy considerations

Other Causes

- Arterial inflammation (vasculitis)
- Trauma
- Prior surgery or stenting
- Congenital abnormalities

1.2 Common Symptoms and Clues

Renal artery disease may not cause symptoms, but your doctor may suspect it if you have:

- High blood pressure that is difficult to control
- Sudden worsening of previously stable blood pressure
- High blood pressure at a young age
- Unexplained decline in kidney function
- Fluid retention or swelling
- Recurrent episodes of pulmonary oedema
- A bruit (whooshing sound) heard over the abdomen

Ultrasound helps determine whether reduced kidney blood flow is contributing to these issues.

2. Why You Have Been Referred for This Scan

Your doctor may recommend a renal artery Doppler ultrasound if you have:

- Difficult-to-control hypertension
- Sudden or severe increases in blood pressure
- Declining kidney function
- Known atherosclerosis in other arteries
- Suspected fibromuscular dysplasia
- A history of renal artery stenting or surgery
- Recurrent fluid overload or pulmonary oedema
- A bruit detected over the renal arteries

The scan helps identify whether renal artery narrowing is present and whether it may be contributing to your symptoms.

3. What the Scan Examines

A renal artery Doppler ultrasound uses B-mode imaging, colour Doppler, and spectral Doppler to assess the kidneys and their blood supply.

Your scan will evaluate:

3.1 Renal Arteries

- Presence of narrowing (stenosis)
- Blood flow velocities
- Turbulence or waveform changes
- Evidence of blockage or reduced flow
- Post-stenotic dilatation

- Renal artery stents (if present)

3.2 Kidney Size and Structure

- Kidney length and cortical thickness
- Symmetry between the two kidneys
- Signs of chronic kidney disease
- Cysts or incidental findings

3.3 Intrarenal Blood Flow

Doppler assessment includes:

- Resistive index (RI)
- Acceleration time and acceleration index
- Waveform patterns in segmental and interlobar arteries

These measurements help determine whether the kidney is receiving adequate blood flow.

3.4 Aorta and Surrounding Vessels

The scan also assesses:

- Abdominal aorta
- Aortic plaque or aneurysm
- Origins of the renal arteries

4. How to Prepare for Your Scan

To ensure the best possible imaging quality:

- **Fast for 4–6 hours before the scan**, as bowel gas can interfere with visualising the renal arteries.
- **Do not smoke or chew gum** during the fasting period, as this increases bowel gas.
- You may take your usual medications with a small sip of water, unless your doctor advises otherwise.
- Wear loose, comfortable clothing, or pants/trousers that can be easily removed for the scan.
- Avoid applying moisturisers or oils to your abdomen on the day of the scan.
- If you have difficulty lying flat, please inform the sonographer so we can adjust your positioning.

If your doctor has requested an **urgent renal artery scan**, please attend as soon as possible.

5. What to Expect During the Scan

A renal artery Doppler ultrasound is safe, painless, and performed by a highly trained vascular sonographer with advanced expertise in renal vascular assessment.

5.1 Duration

The scan typically takes **30–45 minutes**, depending on your anatomy and bowel gas.

5.2 Positioning

You may be examined:

- Lying on your back
- Slightly turned to one side
- Occasionally sitting upright

Your comfort is always prioritised.

5.3 The Procedure

- Warm gel is applied to your abdomen and sides.
- The sonographer gently moves a handheld probe to visualise the kidneys and renal arteries.
- You may be asked to hold your breath briefly to improve image clarity.
- Doppler measurements are taken from the aorta, renal artery origins, and within the kidneys.
- If you prefer a male or female sonographer, please let the practice know when booking.

5.4 Safety

Ultrasound uses sound waves — not radiation — making it safe for all patients, including those with kidney disease, pacemakers, or vascular grafts.

6. How the Scan Helps Guide Treatment

Your scan results help determine the most appropriate management, which may include:

6.1 Medical Management

- Blood pressure control
- Cholesterol-lowering therapy
- Diabetes management
- Smoking cessation
- Medications to protect kidney function

6.2 Minimally Invasive Treatments

If significant narrowing is detected, your doctor may discuss:

- Renal artery angioplasty
- Stent placement

These procedures help restore blood flow to the kidney.

6.3 Surgical Options

Rarely, surgery may be recommended for complex or severe disease.

7. After the Scan

7.1 Review of Images

Your scan images and measurements are reviewed by a vascular specialist or reporting sonographer trained in renal artery assessment.

7.2 Report Delivery

A detailed report is sent to your referring doctor, usually within **24–48 hours**, and includes:

- Presence and severity of renal artery stenosis
- Kidney size and structure
- Intrarenal Doppler measurements
- Aortic findings
- Summary of clinical significance

7.3 Next Steps

Your doctor will discuss the results with you and outline treatment options tailored to your blood pressure and kidney health.

8. Frequently Asked Questions

Why do the kidneys affect my blood pressure? When the kidneys receive reduced blood flow, often due to narrowing of the renal arteries, they release a hormone called renin. Renin triggers the angiotensin system**,** which tightens blood vessels and raises blood pressure. This can make hypertension difficult to control, even with multiple medications. Checking the renal arteries helps determine whether this mechanism is contributing to your high blood pressure.

Is the scan painful? No. You may feel mild pressure, but the scan is not painful.

Can I drive afterward? Yes. Most patients can drive immediately after the scan. In rare cases, your sonographer may need to discuss the findings with a vascular specialist before confirming it is safe for you to drive.

Do I need to stop medications? No. Continue your usual medications unless your doctor advises otherwise.

Is ultrasound safe? Yes. Ultrasound is completely safe and does not use radiation.

Why do I need to fast? Fasting reduces bowel gas, which improves the ability to see the renal arteries clearly.

Will this scan treat my condition? No. This scan is diagnostic only. It provides essential information to guide treatment decisions.

9. Why Choose Our Vascular Lab

State-of-the-art ultrasound technology for high-resolution imaging and precise haemodynamic assessment.

Comprehensive, clinically focused reporting to support accurate diagnosis and tailored treatment planning.

Patient-centred care, with an emphasis on comfort, clear communication, and a supportive experience throughout your visit.

Examinations performed in accordance with international renal Doppler standards, ensuring accuracy and consistency.