Carotid Ultrasound Scan

ARTERY AND VEIN DIAGNOSTICS

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Patient Information

1. Understanding Carotid Artery Disease

The carotid arteries are the major blood vessels located on each side of your neck. They supply oxygen-rich blood to the brain, eyes, and facial structures. Healthy carotid arteries have smooth inner walls that allow blood to flow freely. Over time, however, fatty deposits known as **plaque** can build up inside the artery wall — a process called **atherosclerosis**.

As plaque accumulates, the artery may become narrowed, a condition known as **carotid stenosis**. This narrowing can reduce blood flow to the brain or cause small pieces of plaque to break off and travel to smaller arteries, potentially leading to:

- **Transient ischaemic attack (TIA)** — often called a “mini-stroke”
- **Stroke** — a sudden interruption of blood supply to the brain
- **Sudden neurological symptoms**, such as weakness, numbness, difficulty speaking, or vision changes

Carotid artery disease often develops silently, without symptoms, until a significant event occurs. Early detection is therefore essential.

A carotid duplex ultrasound is a safe, non-invasive test that uses sound waves to create real-time images of the carotid arteries and measure blood flow. It is the gold-standard first-line investigation for detecting atherosclerotic changes, assessing carotid stenosis and evaluating stroke risk.

2. Why You Have Been Referred for This Scan

Your doctor may refer you for a carotid duplex ultrasound for several reasons, including:

Symptoms or Clinical Findings

- Sudden weakness or numbness in the face, arm, or leg
- Difficulty speaking or understanding speech
- Temporary vision loss or blurring (amaurosis fugax)
- Dizziness or unsteadiness
- A carotid bruit (a sound heard with a stethoscope)

Medical History

- Previous TIA or stroke
- Known atherosclerosis in other arteries (e.g., coronary or peripheral arteries)
- High blood pressure
- Diabetes
- High cholesterol
- Smoking history
- Family history of vascular disease

Pre-operative Assessment

Carotid ultrasound may be recommended before:

- Heart surgery
- Major vascular surgery
- Procedures where blood pressure changes may affect cerebral circulation

Post-Treatment Surveillance

If you have previously undergone:

- Carotid endarterectomy
- Carotid artery stenting

the scan helps monitor for restenosis or other changes.

The purpose of the scan is to identify the presence, severity, and characteristics of carotid artery disease so your doctor can determine the safest and most effective treatment plan.

3. What the Scan Examines

A carotid duplex ultrasound combines three key components:

- B-mode imaging — shows the structure of the artery
- Colour Doppler — shows blood flow direction and turbulence
- Spectral Doppler — measures blood flow velocities to determine severity of narrowing

Your scan will assess the following:

3.1 Carotid Artery Anatomy

The sonographer will examine:

- Common carotid artery (CCA)
- Carotid bulb
- Internal carotid artery (ICA)
- External carotid artery (ECA)
- Vertebral arteries
- Subclavian arteries (in some cases)

This allows assessment of the entire carotid system from its origin to the point where it enters the skull.

3.2 Plaque Detection and Characterisation

The scan identifies:

- Presence of plaque
- Plaque size and location
- Plaque surface (smooth, irregular, ulcerated)

- Plaque composition (soft, mixed, calcified)

These features help determine stroke risk and guide treatment decisions.

3.3 Degree of Narrowing (Stenosis)

Using Doppler measurements, the scan evaluates:

- Peak systolic velocity (PSV)
- End-diastolic velocity (EDV)
- ICA/CCA ratio
- Flow turbulence or waveform changes

These measurements are compared with internationally recognised criteria to determine the severity of stenosis.

3.4 Vertebral Artery Assessment

The vertebral arteries supply the back of the brain. The scan evaluates:

- Direction of flow (forward or reversed)
- Flow velocity
- Signs of **subclavian steal syndrome**, if clinically suspected

3.5 Post-Surgical or Post-Stent Evaluation

If you have had previous carotid treatment, the scan assesses:

- Stent patency
- Restenosis
- Patch or endarterectomy site
- Flow characteristics around surgical repairs

This ensures long-term monitoring and early detection of any changes.

4. How to Prepare for Your Scan

Most patients **do not** need special preparation. However:

- Wear a loose-fitting top or shirt with a wide neckline.
- Avoid wearing necklaces or high-collared clothing.
- Continue taking your usual medications unless your doctor advises otherwise.
- If you have limited neck movement or discomfort when lying flat, please inform the sonographer so we can adjust your positioning.
- If you have wound dressings or surgical sites on the neck, the sonographer will advise whether they should remain in place or be adjusted for the scan.

5. What to Expect During the Scan

A carotid duplex ultrasound is safe, painless, and performed by a highly trained vascular sonographer with advanced expertise in cerebrovascular assessment.

5.1 Duration

The scan typically takes **20–30 minutes**, depending on your anatomy and clinical history.

5.2 Positioning

You will lie comfortably on your back with your head slightly turned to one side. A small pillow or support may be used to ensure comfort.

5.3 The Procedure

- A small amount of warm gel is applied to your neck.
- The sonographer gently moves a handheld probe (transducer) along each side of your neck.
- You may hear whooshing sounds from the Doppler — this is normal and represents blood flow.
- The sonographer may ask you to remain still or adjust your head position for clearer imaging.

5.4 Safety

Ultrasound uses sound waves — not radiation — making it safe for all patients, including those who are pregnant. Some patients may feel slight pressure on the neck during the scan, but it should not be painful. If you feel uncomfortable at any time, please let the sonographer know so we can adjust your position.

6. How the Scan Helps Guide Treatment

Your carotid ultrasound results help your doctor determine the most appropriate management, which may include:

6.1 Medical Management

Most patients with mild to moderate carotid disease are managed with:

- Blood-thinning medication
- Cholesterol-lowering therapy
- Blood pressure control
- Diabetes management
- Lifestyle modification (diet, exercise, smoking cessation)

These measures significantly reduce the risk of stroke.

6.2 Surgical or Interventional Options

If significant narrowing is detected, your doctor may discuss:

Carotid Endarterectomy

A surgical procedure where plaque is removed from the artery to restore normal blood flow.

Carotid Artery Stenting

A minimally invasive procedure where a stent is placed to widen the artery and maintain blood flow.

The decision depends on:

- Degree of stenosis
- Symptoms
- Age and overall health
- Anatomy of the artery
- Presence of other medical conditions

Your ultrasound findings are essential in guiding these decisions.

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 cerebrovascular assessment.

7.2 Report Delivery

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

- Degree of stenosis
- Plaque characteristics
- Blood flow velocities
- ICA/CCA ratio
- Vertebral artery findings
- Summary of clinical significance

7.3 Next Steps

Your doctor will discuss the results with you and outline any recommended treatment or follow-up.

8. Frequently Asked Questions

Is the scan painful? No. You may feel light pressure on your neck, but the scan is not painful.

Can I drive afterward? Yes. There are no restrictions after the scan. In rare situations, your sonographer may need to discuss the findings with a vascular specialist before confirming that it is safe for you to leave.

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

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

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 cerebrovascular ultrasound standards, ensuring accuracy, consistency, and best-practice methodology.