Number	Date	Scan	CHI
1	28/04/2022	Carotid	0111502012
2	28/04/2022	Carotid	1802492216
3	03/05/2022	Carotid	2611502137
4	03/05/2022	Carotid	0307592197
5	06/05/2022	Carotid	0110392108
6	06/05/2022	Carotid	2411372000
7	09/05/2022	Carotid	0510452213
8	09/05/2022	Carotid	1012662160
9	09/05/2022	Carotid	0308572068
10	10/05/2022	Carotid	1508592136
11	10/05/2022	Carotid	0510452213
12	10/05/2022	Carotid	2105652158
13	11/05/2022	Carotid	0805382089
14	16/05/2022	Carotid	2605651010
15	17/05/2022	Carotid	1405492228
16	19/05/2022	Carotid	2405442159
17	20/05/2022	Carotid	0807562211
18	23/05/2022	Carotid	2212662335
19	22/05/2022	Carotid	0412502275
20	24/05/2022	Carotid	1009582208
21	24/05/2022	Carotid	0801712157
22	31/05/2022	Carotid	2509750240
23	31/05/2022	Carotid	2907399004
24	02/06/2022	Carotid	0607562196
25	02/06/2022	Carotid	3105442278

Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
28/04/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
2221643

CHI
0111502012

Tests performed: **Carotid Duplex**

Results:
please note high bifurcation

Right

Common Carotid - Minor disease throughout

Internal Carotid - Moderate disease in bulb

External Carotid - Mild disease throughout

Vertebral - Patent with antigrade flow

Left

Common Carotid - Mild disease throughout

Internal Carotid - Stenosis proximally, Using peak velocities the stenosis workes out to be 70 -79% however using st mary ratio and Peak systoloic velocity ratio it works out to be 50 -59%. distally the vessel is patent

External Carotid - Mild disease throughout

Vertebral - Patent with antigrade flow

Scanned By:- Heather Lynn

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
28/04/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
2239702

CHI
1802492216

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Minor disease throughout

Internal Carotid - Mild disease throughout

External Carotid - Mild disease throughout

Vertebral - Patent with antigrade flow

Left

Common Carotid - Minor disease throughout

Internal Carotid - Mild disease throughout

External Carotid - Mild disease throughout

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
03/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
2012591

CHI
2611502137

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Mild disease throughout

Internal Carotid - 70 -89% stenosis proximally (mixed plaque). 2.5cm from the mandible. Distally the vessel is patent however mild plaque noted

External Carotid - Mild disease throughout

Vertebral - Patent with antigrade flow

Left

Common Carotid - Mild disease throughout

Internal Carotid - Mild disease throughout

External Carotid - high velocities seen proximally >200cm/sec distally mild disease

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
03/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
2261518

CHI
0307592197

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Aberdeen Royal Infirmary

Consultant: [redacted]
Neurologist
Ward 403 ARI

Episode date
06/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0840161

CHI
0110392108

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Mild disease in bulb

External Carotid - Mild disease proxinally

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Mild disease in bulb

External Carotid - Mild disease proxinally

Vertebral - Patent with antigrade flow

Scanned By: Heather Lynn

Consultant: [redacted]
Stroke Care
Ward 403

Episode date
06/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
241137

CHI
2411372000

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Mild disease throughout

External Carotid - Mild disease throughout

Vertebral - Appears within normal limits

Left

Common Carotid - Appears within normal limits

Internal Carotid - Mild disease throughout (tortuous distally)

External Carotid - Mild disease

Vertebral - Appears within normal limits

Scanned By:- Heather Lynn
Trainee Clinical Scientist

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 403

Episode date
09/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0440533

CHI

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Minor disease

Internal Carotid - Mild disease in bulb

External Carotid - Minor disease

Vertebral - Patent with antigrade flow

Left

Common Carotid - Minor disease

Internal Carotid - Mild disease in bulb

External Carotid - Minor disease

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Vascular Surgeon
Ward 215 ARI

Episode date
09/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0288758

CHI
1012662160

Tests performed: **Carotid Duplex**

Results:

The subclavian appears patent with a monophasic waveform could not identift stenosis ?proximal

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - patent with antigrade flow (well established)

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with retrograde flow completely

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Neurologist
Ward 403 ARI

Episode date
09/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
030857

CHI
0308572068

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Minor disease throughout

Internal Carotid - Minor disease throughout

External Carotid - Minor disease throughout

Vertebral - Patent with antigrdae flow

Left

Common Carotid - Minor disease throughout

Internal Carotid - Minor disease throughout

External Carotid - Minor disease throughout

Vertebral - Patent with antigrdae flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 403

Episode date
10/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0261744

CHI
1508592136

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 403

Episode date
10/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0843131

CHI
0510452213

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Minor/mild plaque in bulb

External Carotid - minor disease proximally

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Minor/mild plaque in bulb

External Carotid - minor disease proximally

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: Locum
Vascular Consultant
Ward 215 ARI

Episode date
10/05/2022

Ward
Outpatient

Patient: [redacted]

Unit Number
0266978

CHI
2105652158

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Appears within normal limts

Internal Carotid - Appears within normal limts

External Carotid - Appears within normal limts

Vertebral - Not imaged

Left

Common Carotid - Appears within normal limts

Internal Carotid - Appears within normal limts

External Carotid - Appears within normal limts

Vertebral - Not imaged

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
11/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0188745

CHI
0805382089

Tests performed: Carotid Duplex

Results:

Bilaterally ICA and ECA have very high bifurcation therefore only proximal vessel assessed

Right

Common Carotid - Appears within normal limits

Internal Carotid - MIld disease proximally

External Carotid - mild disease proximally

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Minor disease proximally

External Carotid - Minor disease proximally

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: Locum
Vascular Consultant
Ward 215 ARI

Episode date
16/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
260565

CHI
2605651010

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant:

Episode date
17/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0766523

CHI
1405492228

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - minor disease

Internal Carotid - High bifurcation minor disease throughout

External Carotid - High bifurcation minor disease throughout

Vertebral - Patent with antigrade flow

Left

Common Carotid - Minor disease

Internal Carotid - Minor disease

External Carotid - Minor disease

Vertebral - Patent with antigrade flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant:

Episode date
19/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0175177

CHI
2405442159

Tests performed: Carotid Duplex

Results:

Right

Common Carotid - Minor disease

Internal Carotid - Mild disease in bulb

External Carotid - Minor disease throughout

Vertebral - Not imaged

Left

Common Carotid - Minor disease throughout

Internal Carotid - Mild disease in bulb

External Carotid - Minor disease throughout

Vertebral - Patent with antigrade flow

Return

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
20/05/2022

Ward
Outpatient

Patient: [redacted]

Unit Number
080756

CHI
0807562211

Tests performed: **Carotid Duplex**

Results:

Right
Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Left
Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Heather Lynn

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 403 ARI

Episode date
23/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0517076

CHI
2212662335

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrdae flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrdae flow

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 403 ARI

Episode date
23/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0421236

CHI
0412502275

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
24/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
0260073

CHI
1009582208

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Scanned By:- Heather Lynn

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 402

Episode date
24/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
080171

CHI
0801712157

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrdae flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Appears within normal limits

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Consultant: [redacted]
Vascular Surgeon
Ward 215 ARI

Episode date
31/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
250975

CHI
2509750240

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears with in normal limits

Internal Carotid - Appears with in normal limits

External Carotid - Appears with in normal limits

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears with in normal limits

Internal Carotid - Appears with in normal limits

External Carotid - Appears with in normal limits

Vertebral - Patent with antigrade flow

Scanned By:- Heather Lynn
Trainee Clinical Scientist

Consultant:

Episode date
31/05/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
1526975

CHI
2907399004

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Mild disease throughout

Internal Carotid - Increased velocities in the bulb ~ 137cm/sec which works out to be 50 - 59% stenosis using max velocities and using the ICA/CCA ratio it works out to be just 2x.

External Carotid - Moderate significant disease proximally

Vertebral - Not imaged

Left

Common Carotid - Mild disease throughout

Internal Carotid - Increased velocities in the bulb ~ 137cm/sec which works out to be 50 - 59% stenosis using max velocities and using the ICA/CCA ratio it works out to be just 2x

External Carotid - Moderate significant disease proximally

Vertebral - Patent with antigrade flow

Scanned By:- Heather Lynn

The Vascular Laboratory
Aberdeen Royal Infirmary

Consultant: [redacted]
Stroke Care
Ward 403

Episode date
02/06/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
060756

CHI
0607562196

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Appears within normal limits

Internal Carotid - Mild disease in bulb

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Left

Common Carotid - Appears within normal limits

Internal Carotid - Mild disease in bulb

External Carotid - Appears within normal limits

Vertebral - Patent with antigrade flow

Aberdeen Royal Infirmary

Consultant: [redacted]
Neurologist
Ward 403 ARI

Episode date
02/06/2022

Ward
Outpatient

Patient:
[redacted]

Unit Number
1009262

CHI
3105442278

Tests performed: **Carotid Duplex**

Results:

Right

Common Carotid - Minor disease throughout

Internal Carotid - Mild in bulb

External Carotid - Minor disease throughout

Vertebral - Patent with antigrade flow

Left

Common Carotid - Minor disease throughout

Internal Carotid - Moderate disease throughout

External Carotid - Minor disease throughout

Vertebral - Patent with antigrade flow

CAROTID ASSESSMENT

SCANNER SETTING:

Carotid

PROBES:

5-8MHz

PATIENT POSITION

Supine with support for head and neck with head just above the pillow rotated to the contra-lateral side and neck slightly stretched.

DISEASE GRADING

Intimal wall thickening - Noticable thickening of intimal-medial layer. Obtain measurement.

Minor plaque - Localised areas of plaque, not causing flow disturbance.

Mild plaque - Flow disturbance evident and causing <50% diameter reduction.

Significant - >50% diameter reduction with PSV's and/or stenosis grading criteria being quoted.

Plaque Morphology:- Plaque can be characterised into how echogenic the plaque is i.e. low, medium or high, or if it is a smooth or irregular plaque and whether it is homogenous (one type of plaque) or heterogenous (different types of plaques).

Stenosis grading: - Stenoses are graded using the criteria recommended by the joint working group(attached). When a stenosis is present note its position in the vessel and estimate the distance from the angle of the mandible. Also note how far the disease extends up the vessel.

IMAGES:

When obtaining images ensure that the correct side and site is recorded. Note any abnormalities and specific structures related to the investigation. Obtain images as necessary with descriptive text of what was seen and also specifically at key points of proximal CCA, ECA and distal ICA.

Prior to Scanning:

Ensure the patient is comfortable and there is clear access to the base of the neck.

SCANNING TECHNIQUE

1. Start in a transverse view in B-mode, at the base of the neck. On the right scan down to identify the origin of the CCA and the innominate artery. On the left this is not generally possible due to the anatomy, but still scan down as far as possible.

2. Scan up the neck to identify the bifurcation and determine the orientation of the ICA and ECA, noting any plaque or other anomalies that may be present.

3. Switch on the colour Doppler and repeat the scan looking for any flow disturbance or aliasing.

4. Turn the probe into a longitudinal view and obtain a Doppler waveform from the CCA at the base of the neck. If the patients' breathing is affecting the position of the Doppler sample, ask the patient to stop breathing for a few seconds if possible.

5. Scan up the CCA and using the Doppler assess the flow as necessary and grade any plaque present. Record the peak systolic and end diastolic velocities within 2cm of the bifurcation at a point where the vessel still has a uniform diameter.

6. Using the transverse scan from memory and also the colour Doppler, identify the ECA noting any plaque and obtaining a Doppler waveform.

7. Identify and assess the ICA obtaining a Doppler waveform as distal as possible. When there is significant plaque assess and grade it with the Doppler at the level where the highest PSV is seen, obtaining images and recording the peak systolic and end diastolic velocities and the level of the stenosis from the angle of the mandible.

8. Whilst in longitudinal view scan down to just below the level of the bifurcation. Slowly move the probe laterally until the transverse processes of the spine can be seen. Identify the vertebral artery between the processes or as it dives into the processes at the level of the 6^{th} vertebra. Using the Doppler assess the flow noting the direction. If flow is reversed or suggestive of proximal disease assess the vertebral proximally and the flow in the subclavian artery.

Percentage Stenosis (NASCET)	Internal carotid peak systolic velocity cm/sec	Peak systolic velocity ratio ICA_{PSV}/CCA_{PSV}	***St Mary's ratio*** $\boldsymbol{ICA_{PSV}/CCA_{EDV}}$
<50	<125	<2	<8
50-59	>125	2-4	8-10
60-69			11-13
70-79	>230	>4	14-21
80-89			22-29
>90	>400	>5	>30
Near occlusion	High, low-string flow	Variable	Variable
Occlusion	No flow	Not applicable	Not applicable

C.P. Oates et al 2008