



Royal College
of Physicians
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UK CAROTID INTERVENTIONS AUDIT

CAROTID ENDARTERECTOMY DATA QUALITY REPORT

Prepared on behalf of

The Steering Group
by

Clinical Standards Department

Royal College of Physicians of London

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Executive summary

This audit is measuring the quality of care provided to patients who underwent carotid endarterectomy (CEA) or carotid stenting to prevent stroke. This is an interim data quality report for surgeons and Trust CEOs. The Steering Group requests that the actions listed in the last section of this summary are urgently addressed.

The findings are based on data that had been contributed to the audit up until 30th June 2009. The Round 2 findings based on all cases submitted up to 30th September 2009 will be reported in March 2010.

This interim report includes carotid endarterectomy procedures only. Carotid stenting/angioplasty data will be included in the Round 2 report.

Aims of the Clinical Audit

1. To assess the current speed of delivery of carotid intervention in the UK
2. To assess variations in access and quality of care for patients needing carotid intervention
3. To assess 30-day mortality and complications rates following carotid intervention
4. To observe changes over time in the quality of care following carotid intervention

Aims of this Interim report

1. To provide interim national results and key findings (as at 30th June 2009) to participants and relevant groups (e.g. all eligible surgeons/Trusts, Strategic Health Authority CEOs, the English Department of Health, the Welsh Assembly, the Scottish Department of Health, Northern Irish Department of Health, English Stroke Improvement Network leads)
2. To provide data about recruitment
3. To highlight any issues with data collection and data quality
4. To identify ways that recruitment might be increased
5. To inform the selection of appropriate key performance indicators
6. To enable surgeons to start considering how data from this audit can inform the revalidation process

Participation

Participation in national clinical audit is an important component of clinical governance. All consultants who undertake carotid intervention in the UK are eligible to participate in this continuous audit. 415 surgeons (working at 134 Trusts/Health Boards) are known to be performing carotid endarterectomy in their current NHS practice (as of July 2009).

The findings in this report are based on data submitted by a total of 331/415 (80%) surgeons (representing 120/134 (90%) Trusts).

It is very encouraging that the participation rate is increasing, but there is still a considerable way to go to meet the 100% target (submission of all cases from all surgeons/Trusts).

Evidence base

The evidence used for setting audit questions is derived from three main documents:

1. Stroke: The diagnosis and acute management of stroke and transient ischaemic attacks by the National Institute for Health and Clinical Excellence
<http://www.nice.org.uk/Guidance/CG68>
2. National Stroke Strategy <http://www.dh.gov.uk>
3. Implementing the National Stroke Strategy – an imaging guide. <http://www.dh.gov.uk>

Key messages

1. There has been a reduction in the median time from referral to operation from 46 days to 22 days between 2005 and 2009. One of the main findings of the Round 1 Report was the unacceptable delay in patients having surgery following their TIA or minor stroke. This audit shows a very important trend of improvement in waiting times.
2. Surgeon participation in the audit has increased since Round 1 (from 61% to 80%) but we need the last 20% (representing 10% of Trusts) to contribute their data by 31st December 2009 for high quality benchmarking of services.
3. Case recruitment continues to grow; however this needs to be significantly improved by 31st December 2009. The audit is capturing only 61% of the cases that are recorded by HES and all regions are under-represented in this audit (at 30th June 2009). Some regions are performing well when compared to Hospital Episode Statistics (HES), notably the North East and NHS Lothian. However some, including the West Midlands, many in Wales and most of the Health Boards in Scotland are submitting very low proportions of their total number of cases. The inevitable criticism of the findings of this audit will be that the cases may be highly selective and therefore not representative of the whole. It is therefore essential to try and include all cases to ensure the audit is representative of current practice
4. The web tool changeover has been very successful. By 30th June 2009, a total of 3200 cases had been registered onto the National Vascular Database (NVD-online) and 2704/3200 (85%) of these are complete and included in this report.

Action points for surgeons/trusts

1. Please submit all carotid cases performed between 1st January 2008 and 30th September 2009 onto the NVD (www.nvdonline.org.uk) **by 31st December 2009**. This will enable us to produce a report that truly reflects current practice.
2. Please ensure that all your cases are complete, including follow-up data. This is essential for reporting on the whole care pathway.
3. If you are finding it difficult to find the time to enter data please consider nominating a colleague (e.g. a nurse specialist or SpR or Clinical fellow with their agreement) to assist all the surgeons at your Trust with data entry. Some Trusts have managed to do this and are finding it helpful in making participation in the audit more manageable. More information is available from the Helpdesk so the necessary arrangements can be made
4. Please resume data submission if you suspended data entry after Round 1 while we were developing the carotid component of NVD-online. This system is much improved and supports submission of good quality data. Surgeons are able to download complete records at any time for their own use.
5. Please contact the Helpdesk if you require a reminder of your NVD login details, or have any other queries.
6. To ensure that your Trust profile is kept up to date, notify the Helpdesk if:
 - Your Trust recruits a new consultant who performs carotid interventions (including your radiology colleagues).
 - You are leaving the Trust or have stopped performing carotid interventions in your current practice.

Helpdesk contacts:

Email: ceaaudit@rcplondon.ac.uk Tel: 020 7935 1174 Ext 518

1. METHODS

Project governance

The audit is supported by a multidisciplinary Steering Group comprising professional organisations and patients. The audit is funded by the Healthcare Quality Improvement Partnership (HQIP). Day to day management (including running the audit Helpdesk, analysis and reporting of results) takes place within the Clinical Standards Department of the Royal College of Physicians. Data submission (web-based) is via the Vascular Society of Great Britain and Ireland's National Vascular Database (NVD-online).

Audit periods

Round 1: Included CEA operations performed between 1st December 2005 and 31st December 2007 inclusive. The deadline for submitting these cases was 31st Mar 2008.

Round 2: Includes operations performed between 1st January 2008 and 30th September 2009 inclusive (deadline for submitting cases for inclusion in this interim report was 30th June 2009. The deadline for submitting all cases for inclusion in the Round 2 report is 31st December 2009).

Dataset

The *Clinical Audit* proforma covers key aspects of Carotid Endarterectomy (CEA) service provision that are supported by the emerging evidence base:

Phase 1: Case selection criteria, pre-operative investigations, surgical techniques, inpatient stay and status at hospital discharge

Phase 2: Patient status at 30-days post operatively and post-operative assessment to assess surgical outcome.

The proforma was revised after Round 1 (**Appendix 1a**). Many of the data items are common to both datasets, though some new questions were added in Round 2 (**Appendix 1b**).

Data collection

Two different web tools have been used to collect the data for this audit: The current web tool (NVD-online) is based on the revised Round 2 proforma and went live on 8th December 2008. At 30th June 2009, a total of 281 surgeons had submitted a total of 3200 cases. This superseded the original web tool which was based on the Round 1 proforma, which was closed on 30th April 2009. A total of 291 surgeons used this web tool to submit a total of 8255 cases and these were downloaded and securely stored.

To estimate the completeness of data that surgeons/Trusts are contributing to the audit, we obtain from the relevant national agencies (**Appendix 2**), the number of cases performed at each Trust/Health Board, over the equivalent audit period (Hospital Episode Statistics).

Trust / Health Board and surgeon participation

Since Round 1, participation has increased: Trusts/Health Boards, from 76% to 90% and surgeons, from 61% to 73%. See **Table 1** on page 8 and **Table 2** on page 10.

Data yield

By 30th June a total of 11,455 cases had been registered to the audit. Only cases (n=9956) meeting minimum quality criteria were included in the analyses:

- Cases had to be submitted within the relevant audit period (Round 1 or Round 2) and completed to at least Phase 1 by the submission deadline
- No case could be duplicated

The reasons for excluding cases is summarised in **Appendix 3** (flowchart).

Comparison with Hospital Episode Statistics (HES)

HES is the national statistical data warehouse for England of the care provided by NHS hospitals and for NHS hospital patients treated elsewhere. HES is the data source for a wide range of healthcare analysis for the NHS, government and many other organisations and individuals. It also forms the basis on which hospitals are paid.

www.dh.gov.uk/en/Publicationsandstatistics/Statistics/HospitalEpisodeStatistics

There are equivalent agencies in Wales, Scotland and Northern Ireland (**Appendix 2**).

In this report, the term *HES* is used generically to describe data that are collected by these national agencies. Each registers the number of carotid endarterectomy procedures (procedure codes L29.4 and L29.5) that are performed. To estimate the completeness of cases contributed to the audit, we obtained the number of HES-recorded cases performed at each Trust/Health Board over the equivalent audit period.

Comparisons against HES figures are based on only those Trusts that had contributed data to this audit at 30th June 2009. The proportion of cases captured by this audit is as follows (full details are given in **section 2.1**):

- England - 3343/5234 (64%)
- Wales - 123/319 (39%)
- Scotland – 185/500 (37%)
- Northern Ireland - 196/228 (86%)

There were a total of 922 cases on HES for non-participating trusts.

Presentation of interim results

Results are presented as totals and/or percentages, medians and inter quartile ranges (IQR). Not all questions were mandatory and therefore the number of cases included in each analysis may vary. Where results are presented in tables the columns indicate whether they relate to Round 1 or Round 2.

For Round 2 cases, data were submitted via two different web tools involving different datasets. The datasets are comparable and wherever possible individual data items are analysed together, but where they are not comparable separate analyses were done and separate tables are used to present the results.

Availability of results in the public domain

The interim report will be circulated to all eligible surgeons and their Trust CEOs and Medical Directors and appropriate data will be sent to the Healthcare Quality Improvement Partnership (HQIP), the English Department of Health, the Welsh Assembly, the Scottish Department of Health, the Northern Irish Department of Health, Strategic Health Authority CEOs and English Stroke Improvement Network leads. Recipients are strongly encouraged to share the report with relevant members of their teams.

The Round 2 report of March 2010 will contain fuller analyses. Following this the public report will contain named Trust results of key indicators, which we will circulate in the next few weeks.

2. INTERIM RESULTS

2.1. Trust/Health Board and surgeon contribution

Tables 1 and 2 below show the numbers of Trusts / Health Boards and surgeons who are eligible and the number who are contributing data to the audit.

Comment:

Participation in the audit is improving but we are still some way off achieving 100% of surgeons /trusts contributing data, which is really what is necessary for high quality benchmarking of services. Participation is of course voluntary, but data about the quality of care is essential for many purposes including personal appraisals and revalidation, clinical excellence awards and being able to provide patients with accurate data about the risks and benefits of vascular surgery in your hospitals. Please encourage your colleagues to participate.

Table 1 Trust / Health Board eligibility/contribution (as at 30th June 2009)

Region	ROUND 1 (Operation dates 1 st Dec 05 to 31 st Dec 07)		ROUND 2 (Operation dates 1 st Jan 2008 to 30 th Jun 2009)	
	No. eligible Trusts/Health Boards (as at Dec 2007) N	Trusts / Health Boards for which at least 1 surgeon contributed 1 or more cases N (%)	No. eligible Trusts/Health Boards (as at July 2009) N	Trusts / Health Boards with at least 1 surgeon completing 1 or more cases to Phase 1 by 30 th June 2009 N (%)
ENGLAND	114	88 (77%)	112	103 (92%)
East Midlands	6	5 (83%)	7	6 (86%)
East of England	12	10 (83%)	11	11 (100%)
London	19	15 (79%)	18	16 (89%)
North East	5	5 (100%)	5	5 (100%)
North West	18	11 (61%)	18	18 (100%)
South Central	9	2 (22%)	8	6 (75%)
South East Coast	11	8 (73%)	11	10 (91%)
South West	13	13 (100%)	13	13 (100%)
West Midlands	11	9 (82%)	11	9 (82%)
Yorkshire and The Humber	10	10 (100%)	10	9 (90%)
N IRELAND	3	3 (100%)	4	3 (75%)
Eastern Health & Social Services Board	2	2 (100%)	2	2 (100%)
Southern Health & Social Services Board	1	1 (100%)	2	1 (50%)
SCOTLAND	9	7 (78%)	9	8 (89%)
NHS Dumfries & Galloway	1	0	1	1 (100%)
NHS Fife	1	1 (100%)	1	1 (100%)
NHS Forth Valley	1	1 (100%)	1	1 (100%)
NHS Grampian	1	0	1	1 (100%)
NHS Greater Glasgow	1	1 (100%)	1	1 (100%)
NHS Highland	1	1 (100%)	1	1 (100%)
NHS Lanarkshire	1	1 (100%)	1	0
NHS Lothian	1	1 (100%)	1	1 (100%)
NHS Tayside	1	1 (100%)	1	1 (100%)

Region	ROUND 1 (Operation dates 1 st Dec 05 to 31 st Dec 07)		ROUND 2 (Operation dates 1 st Jan 2008 to 30 th Jun 2009)	
	No. eligible Trusts/Health Boards (as at Dec 2007) N	Trusts / Health Boards for which at least 1 surgeon contributed 1 or more cases N (%)	No. eligible Trusts/Health Boards (as at July 2009) N	Trusts / Health Boards with at least 1 surgeon completing 1 or more cases to Phase 1 by 30 th June 2009 N (%)
WALES	9	4 (44%)	9	6 (67%)
Wales Mid & West	3	2 (67%)	3	2 (67%)
Wales North	3	0	3	2 (67%)
Wales South East	3	2 (67%)	3	2 (67%)
UK	135	102 (76%)	134	120 (90%)

Table 2 Surgeons eligibility/contribution (as at 30th June 2009)

Region	ROUND 1 (Operations 1 st Dec 05 to 31 st Dec 07)		ROUND 2 (Operations 1 st Jan 2008 to 30 th Jun 2009)	
	No. eligible surgeons (as at Dec 2007) N	Surgeons who contributed at least 1 case in Round 1 N (%)	No. eligible surgeons (as at July 2009) N	Surgeons with at least 1 Round 2 case completed to Phase 1 by 30 th June 2009 N (%)
ENGLAND	341	211 (62%)	355	269 (76%)
East Midlands	22	14 (64%)	23	18 (78%)
East of England	31	21(68%)	31	26 (84%)
London	56	42 (75%)	60	45 (75%)
North East	20	17 (85%)	21	18 (86%)
North West	46	24 (52%)	51	41 (80%)
South Central	20	5 (25%)	18	15 (83%)
South East Coast	23	11(48%)	22	20 (91%)
South West	38	36 (95%)	44	38 (86%)
West Midlands	46	16 (35%)	44	20 (45%)
Yorkshire and The Humber	39	25 (64%)	41	28 (68%)
N IRELAND	10	8 (80%)	11	10 (91%)
Eastern Health & Social Services Board	8	7 (88%)	8	8 (100%)
Southern Health & Social Services Board	2	1 (50%)	3	2 (67%)
SCOTLAND	26	12 (46%)	30	14 (47%)
NHS Dumfries & Galloway	1	0	2	1 (50%)
NHS Fife	2	1 (50%)	2	1 (50%)
NHS Forth Valley	2	1 (50%)	2	1 (50%)
NHS Grampian	3	0	3	2 (67%)
NHS Greater Glasgow	7	2 (29%)	8	1 (13%)
NHS Highland	1	1 (100%)	1	1 (100%)
NHS Lanarkshire	3	2 (67%)	4	0
NHS Lothian	4	4 (100%)	4	4 (100%)
NHS Tayside	3	1 (33%)	4	3 (75%)
WALES	19	9 (47%)	19	11 (58%)
Wales Mid & West	7	4 (57%)	6	3 (50%)
Wales North	5	0	5	2 (40%)
Wales South East	7	5 (71%)	8	6 (75%)
UK	396	240 (61%)	415	304 (73%)

It is important to note that some surgeons (n=26) perform carotid endarterectomy at more than 1 Trust and Trusts can be in different SHAs. One surgeon performs the operation in England and in Scotland, hence crossing country borders.

2.2 Contribution of cases

9956 cases have been included in this report. 8603/9956 (86%) were completed to follow-up (Phase 2). 7264/9956 (73%) were submitted via the original web tool, and 2692/9956 (27%) via NVD-online. 4443/9956 of the cases are Round 2 cases. Refer to **Appendix 3** for case inclusion process.

2.2.1 Comparison of audit data to Hospital Episode Statistics (HES)

We use HES data to estimate the number of cases that each Trust within each SHA is expected to submit to the audit if they include all their cases. Though we acknowledge that HES data are prone to coding biases that exist between Trusts/Health Boards, we do anticipate some cancelling out and smaller overall systematic differences at SHA level.

We analysed the audit data (see **Table 3** on page 12) in a format following the format in which HES data are provided i.e. the number of procedures recorded by HES is based on:

- the date of operation (Northern Ireland)
- the date of admission (Scotland/Wales)
- the date of discharge (England)

Additionally, the audit data were analysed for the equivalent period that HES data were available for:

- January 2008 to Mar 2009 inclusive (England/Scotland/Northern Ireland)
- January 2008 to December 2008 only (Wales)

The findings for each country are as follows:

England

HES reported 5234 operations and the audit captured 3343/5234 (64%). There are 112 eligible Trusts in England. 92/112 (82%) submitted data that can be compared with HES data, and 21/112 (19%) have submitted 90% or more of their HES total.

There are discrepancies in the HES data though in that:

- 9/112 (8%) of Trusts have submitted more cases than their HES total
- One Trust has no cases on HES though some have been submitted to the audit
- There are marked regional differences in completeness against HES, larger than could be ascribed to bias in HES. The lowest regional completeness was 31% and the highest was 88%.

Wales

HES reported 319 and 123/319 (39%) were submitted to the audit. Unlike the other countries the HES figure includes stents.

Scotland

HES reported 500 cases and the audit captured 185/500 (37%).

Northern Ireland

HES reported 228 cases and the data captured 196/228 (86%).

2.2.2 Comparison at regional level

The current case ascertainment is insufficient to report on national practice and it would not be appropriate to report named Trust data on process or outcome unless this is substantially increased by 31st December 2009. Individual surgeons, Trust CEOs, HQIP and Stroke Improvement Networks will be notified at the appropriate level of detail where the gaps appear to be, to encourage participation in the audit and to gain insight into reasons why Trusts have not contributed so far. Each surgeon will be notified of the number of CEA operations they have contributed to this audit and the number that they have undertaken over the audit period according to HES will be stated for comparison. The Round 2 national report in March 2010 will contain Trust-level HES data comparisons.

Comment:

There are two reasons why there may be a mismatch between the number of cases coded as having CEA on HES and the number submitted to the audit. Either HES data are incorrect or there is omission of some of the cases to this audit. It is well recognised that there are inaccuracies in HES. Hospitals are reimbursed on the basis of their coding on which HES is based and therefore it is essential that these data are as accurate as possible. However, only 61% of the number of cases reported on HES are included in this audit. It seems probable that this is due to under-reporting which makes interpretation of the data in this audit very difficult. If there is to be any value in continuing with this project then we need as near to 100% case inclusion as possible. There are some regions that are performing well, notably the North East and NHS Lothian. Some including West Midlands, many in Wales and most of the Health Boards in Scotland are submitting very low proportions of their total number of cases. The inevitable criticism of the findings of this audit will be that the cases may be highly selective and not representative of the whole. It is therefore essential to try and include all cases to ensure the audit is representative of current practice.

Table 3 Case contribution to this audit compared to HES reported caseload

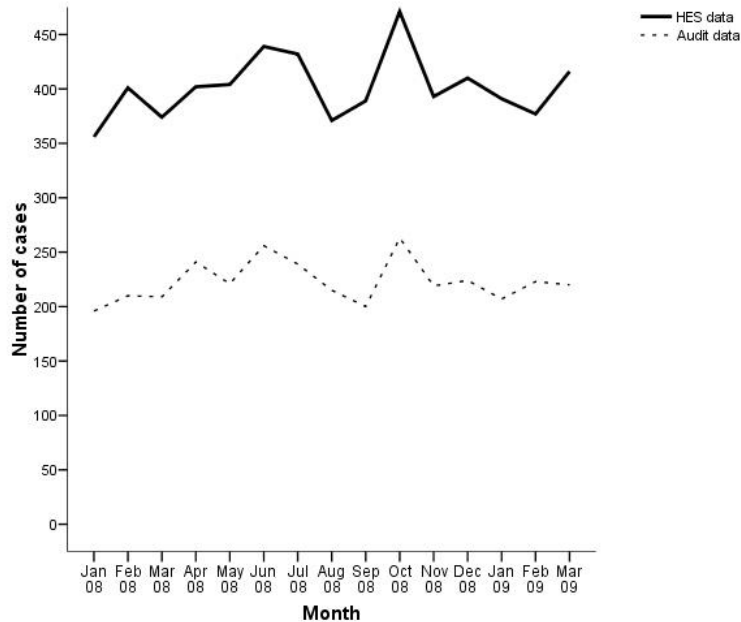
Region	ROUND 1 (Operations 1 st Dec 05 to 31 st Dec 07)		ROUND 2 (Matched with HES data for: England/Scotland/N Ireland – 01/01/08 to 31/03/09. Wales - 01/01/08 to 31/12/08)	
	Total Round 1 cases as recorded by HES (based on contributing Trusts only)	Total Round 1 cases contributed to this audit (% of HES cases)	Round 2 cases as recorded by HES (based on contributing Trusts only)	Round 2 cases contributed to this audit (% of HES cases)
ENGLAND	7056	4718 (67%)	5234	3343 (64%)
East Midlands	404	348 (86%)	215	182 (85%)
East of England	641	470 (73%)	510	417 (82%)
London	918	680 (74%)	597	330 (55%)
North East	545	471 (86%)	328	306 (93%)
North West	1079	659 (61%)	1037	565 (54%)
South Central	163	137 (84%)	400	206 (52%)
South East Coast	373	199 (53%)	353	301 (85%)
South West	1047	792 (76%)	674	504 (75%)
W Midlands	985	452 (46%)	589	213 (36%)
Yorkshire and The Humber	901	510 (57%)	531	319 (60%)
N IRELAND	324	162 (50%)	228	196 (86%)
Eastern HSSB	Not available	-	Not available	Not available
Southern HSS Board	Not available	-	Not available	Not available
SCOTLAND	793	376 (47%)	500	185 (37%)
NHS Dumfries and Galloway	-	0	28	5 (18%)
NHS Fife	48	41 (85%)	39	10 (26%)
NHS Forth Valley	82	47 (57%)	43	20 (47%)
NHS Grampian	-	0	44	11 (25%)
NHS Greater Glasgow (including Golden Jubilee)	289	25 (9%)	149	7 (5%)
NHS Highland	74	71 (96%)	55	39 (71%)
NHS Lothian	182	161 (88%)	95	89 (94%)
NHS Tayside	80	10 (13%)	47	4 (9%)
WALES	530	234 (44%)	319	123 (39%)
Wales Mid & West	280	61 (22%)	90	35 (39%)
Wales North	-	0	50	20 (40%)
Wales S East	250	173 (69%)	179	68 (38%)
UK	8703	5490 (63%)	6281	3847 (61 %)

For England, the difference appears constant (see **Graph 1a** below). This graph includes:

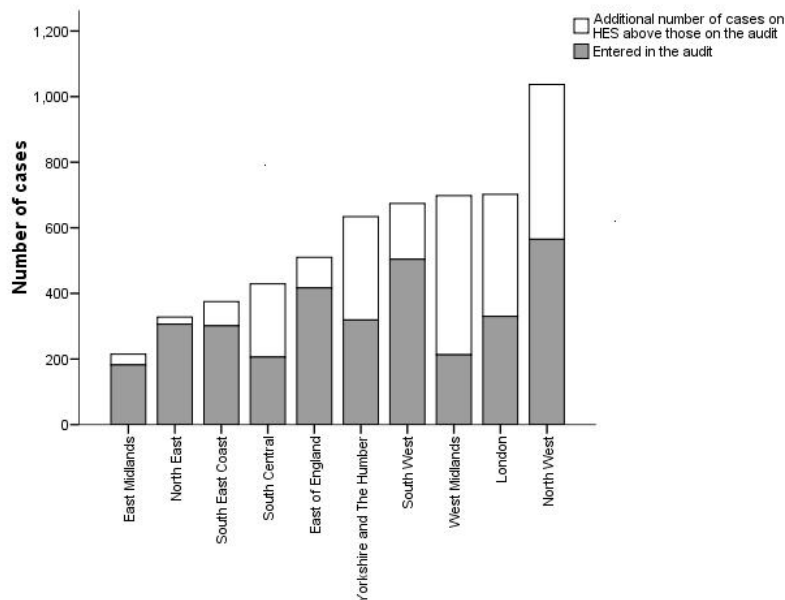
- All cases reported by HES (n=6026), regardless of whether all the Trusts within each SHA has contributed any data to the audit.
- All cases contributed to the audit regardless of whether HES reported any cases for each of the Trusts

It is therefore not appropriate to compare this graph with the figures quoted in **Table 3** for England.

Graph 1a Month by month CEA caseload for England as reported to this audit versus HES records (based on date of discharge)



Graph 1b Comparing regional caseload for English SHAs as reported to this audit versus HES records (based on date of discharge)



Graph 1b above shows the gaps in the number of cases that each English SHA is expected to submit to the audit. Surgeons/trusts are strongly encouraged to ensure that the gaps are closed by the 31st December 2009 for inclusion in the Round 2 report of March 2010. This would enable us to produce more robust reports.

2.2.3 Comparison at Stroke Improvement Network (SIN) level (England only)

The Networks in England (**Appendix 5**) encompass the whole stroke pathway by connecting different organisations and teams involved along the patients journey, so individuals experience co-ordinated management from the first contact which extends to lifelong support as a stroke survivor. Networks involve stroke survivors and carers as active partners in coordinating and supporting service development. <http://www.improvement.nhs.uk/stroke/StrokeCareNetworks>

Table 4 Stroke Improvement Networks (SINs) contribution (1st Jan 2008 to 31st Mar 2009)

Stroke Improvement Network (SIN)	HES total (based on contributing Trusts only) N	Total Round 2 cases contributed to the audit N	% completeness
Anglia Stroke and Heart Network	315	250	79%
Avon, Gloucestershire, Wiltshire and Somerset Cardiac and Stroke Network	285	212	74%
Bedfordshire and Hertfordshire Heart and Stroke Network	71	56	79%
Birmingham, Sandwell and Solihull Cardiac and Stroke Network	99	58	59%
Black Country Cardiovascular Network	123	27	22%
Cardiac and Stroke Networks in Cumbria and Lancashire	239	145	61%
Cheshire and Merseyside Cardiac Network working with the Stroke Community	302	185	61%
Coventry and Warwickshire Cardiovascular Network	90	3	3%
Dorset Cardiac and Stroke Network	116	96	83%
East Midlands Cardiac and Stroke Network	215	182	85%
Essex Cardiac and Stroke Network	124	111	90%
Greater Manchester and Cheshire Cardiac Network	496	235	47%
Herefordshire and Worcestershire Cardiac and Stroke Network	113	51	45%
Kent Stroke Network	161	124	77%
North and East Yorkshire and Northern Lincolnshire Cardiac and Stroke Network	170	80	47%
North Central London Cardiac and Stroke Network	114	51	45%
North East London Cardiovascular and Stroke Network	114	38	33%
North of England Cardiovascular Network	328	306	93%
North Trent Stroke Strategy Project	162	100	62%
North West London Cardiac and Stroke Network	199	164	82%
Peninsula Cardiac Managed Clinical Network	273	196	72%
Shropshire and Staffordshire Heart and Stroke Network	164	74	45%
South Central Vascular Networks	400	206	52%
South East London Cardiac and Stroke Network	82	11	13%
South West London Cardiac and Stroke Network	67	61	91%
Surrey Heart and Stroke Network	122	73	60%
Sussex Stroke Network	91	109	120%*
West Yorkshire Cardiovascular Network	199	139	70%

* For one Trust in this SIN, HES has no cases recorded, however the relevant Trust has submitted 84 usable cases in the audit

Comment:

This demonstrates that carotid endarterectomy is a low volume operation for many vascular surgeons. Whilst the complication rates of surgery in this audit are low this will no doubt stimulate further debate amongst vascular surgeons regarding an acceptable minimum number of procedures that should be performed per annum.

2.3 Data returns as at 30th June 2009 (by phase)

The cases contributed to the audit showed that the median number of cases contributed per surgeon was 11 (IQR 5-21) complete to Phase 1 and 8 (IQR 3-17) complete to Phase 2. The median per year, based on HES data is 9 cases per surgeon. This suggests therefore, that the surgeons who are not contributing to the audit tend to be those doing fewer operations.

Data are entered in 2 phases (see **Appendix 1b**):

Phase 1 referral to post-operative hospital discharge.

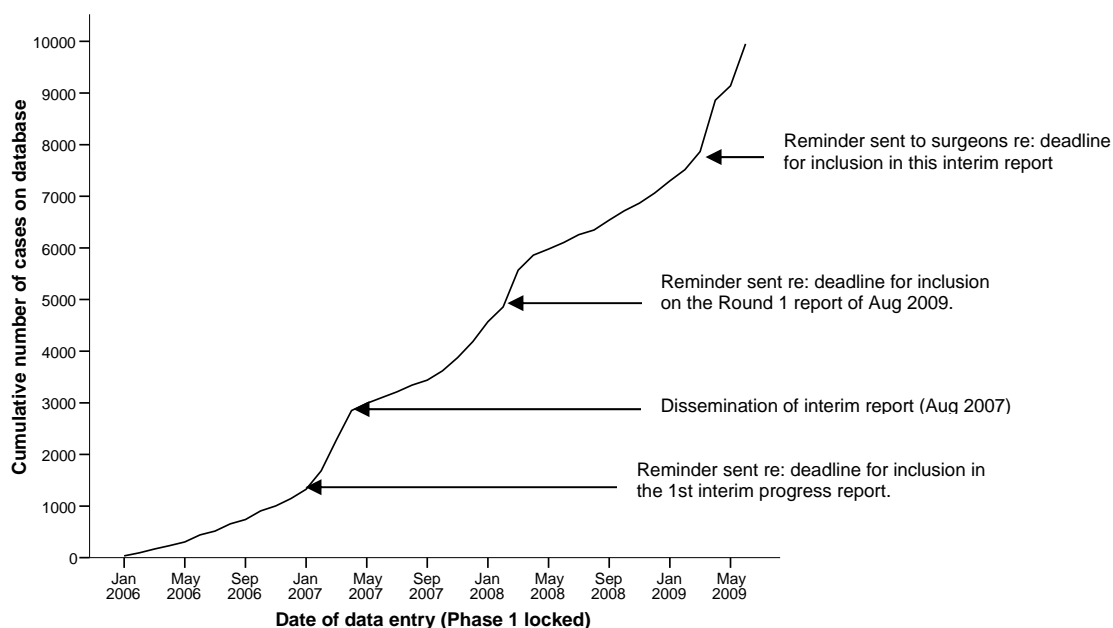
Phase 2 patient status at 30days post CEA and review (follow-up).

Table 5 Data yield (as at 30th June 2009)

1 Jan 2008 – 30 Jun 2009	Round 1	Round 2
No. cases with Phase 1 completed	5513	4443
No. cases with Phase 2 completed	4964	3639
No. surgeons completing up to Phase 1	240	298
No. surgeons completing up to Phase 2	206	271
No. hospitals with some Phase 1 data complete	120	139
No. hospitals with some Phase 2 data complete	105	129

The 8603/9956 (86%) cases that were fully complete were submitted by a total of 304/415 (73%) of the surgeons. It is very important that all surgeons/Trusts ensure that all their cases are as complete as possible by 31st December 2009.

Graph 3 Cumulative number of cases contributed to the audit



Most surgeons are entering data within a short timeframe of surgery, but a few have not entered any operations recently and entering their data will be a considerable task. However, the data show that surgeons who started entering cases about a year ago have managed to enter as many as those who have been involved for longer. It is only the most recent recruits who are still catching up. We have also considered the effect of taking a long time before entering the data. A few surgeons are entering cases up to two years after the operation. While it is admirable to catch up from the beginning, surgeons with longer mean time-lags tend to have entered relatively fewer cases and have not yet caught up to current cases. This approach is perhaps due to the difficult task of retrospectively reviewing patient notes. However, only a few surgeons doing this retrospective catch-up approach seem to have lost momentum.

PHASE 1 - REFERRAL TO DISCHARGE RESULTS

3 Clinico-demographics

3.1 Age and gender of CEA patients

This information was complete for all 9956 cases i.e. both rounds of the audit..

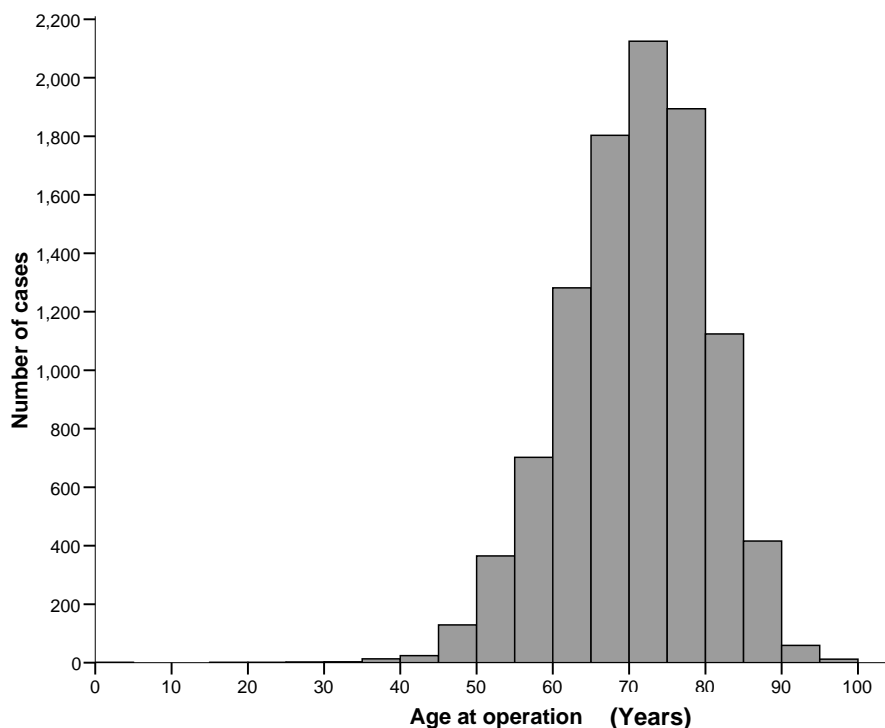
Comment:

The case-mix of the patients from both rounds is virtually identical. This suggests that there has been no shift in the selection criteria for surgery. If there is case selection amongst contributing surgeons then they are doing it in a remarkably consistent way.

Table 6 Age at operation

	Round 1 (5513 cases)	Round 2 (4443 cases)
Male	3751 (68%)	3071 (69%)
Mean age (years)	70.1	70.7
Median age (years)	71	71
IQR of age (years)	64-77	65-78
Mean age for men (years)	69.8	70.6
Median age for men (years)	71	71
Mean age for women (years)	70.7	71.0
Median age for women (years)	72	72

Graph 5 Age at operation



3.2 Medical history of CEA patients

Table 7 Medical history of CEA patients (as at 30th June 2009)

Co-morbidities	Round 1 (5513 cases)		Round 2 (4443 cases)	
	N	%	N	%
Q2.1 Diagnosed diabetic	1178/5509 (4 missing)	21%	884/4438 (5 missing)	20%
Q2.2 Current symptoms of IHD, CHF or treatment for it	1762/5513	32%	1339/4442 (1 missing)	30%

3.3 CEA for symptomatic carotid disease

Comment:

8324/9956 (84%) of cases are operated on for symptomatic carotid disease. This proportion has remained unchanged over the course of Round 1 and 2.

Table 8 CEA for symptomatic carotid disease

	Round 1 (5513 cases)		Round 2 (4442 cases, 1 missing)	
	N	%	N	%
Q4.1 Patients symptomatic for carotid disease	4624	84%	3705	83%

3.4 Carotid stenosis

Comment:

The majority of cases are being operated on in line with recommendations from the NICE Guidelines for Acute Stroke and TIA.

Table 9 Carotid stenosis

	Round 1 (5513 cases)		Round 2 (4407, 36 missing)	
	N	%	N	%
Q5.2a Grade of ipsilateral carotid stenosis on diagnostic imaging that identified ICA stenosis requiring treatment				
<50%	93	2%	27	1%
50-69%	529	10%	661	15%
70-89%	3176	58%	2448	56%
90-99%	1715	31%	1259	29%

4. Delays between symptoms, initial imaging, referral, admission and surgery

4.1 Delay between index symptom and referral

Comment:

It appears that there has been a big increase over the last year in the proportion of patients referred within a week of symptoms – from 18% of cases to 34%. If this is a true reflection of current practice and not a result of selective data entry then services are improving at a considerable rate.

Table 10a Timing of the symptom that triggered referral (submitted via the original web tool)

Q4.1a/Q4.1b Timing of the symptom that triggered referral for surgery	Round 1 (4624 cases)	Round 2 (original web tool) (1495 cases, 1 missing)
< 1 week	841 (18%)	453 (30%)
1-2 weeks	880 (19%)	308 (20%)
3-4 weeks	851(18%)	251 (17%)
5-7 weeks	573 (12%)	168 (11%)
8-12 weeks	590 (13%)	139 (9%)
> 12 weeks	889 (19%)	176 (12%)

In Round 2 we are collecting the exact date of the symptom, if it is known. If the date is not known, an estimate (in bands of days) is given. An estimate was given for 682/2692 (25 %) of the cases.

Table 10b Timing of the symptom that triggered referral (submitted via NVD-online)

Q4.1a/Q4.1b Timing of the symptom that triggered referral for surgery	Round 2 (submitted via NVD-online) (2178 cases, 31 cases not known or missing)	
	N	%
Same day	82	4%
1-2 days	204	9%
3-7 days	453	21%
8-14 days	340	16%
15-21 days	163	7%
22-28 days	176	8%
29+ days	760	35%

4.2 Delay between most recent symptom and surgery

Comment:

28% of patients in Round 2 are being operated on within two weeks of their most recent symptom compared to 20% in Round 1. The median delay has fallen from 40 to 26 days. Therefore there has been a substantial improvement since Round 1 but there remains a need to reduce the delay further in the majority of patients.

Table 11 Timing of most recent ischaemic event prior to surgery

Q7.1 Timing of most recent ischaemic event prior to surgery	Round 1 (4621 cases, 3 missing)		Round 2 (3185 cases, 520 missing)	
	N	%	N	%
< 1 week	479	10%	387	12%
1 week	93	2%	71	2%
>1 week and <= 2 weeks	374	8%	447	14%
>2 weeks and <= 4 weeks	655	14%	574	18%
>4 weeks and <= 6 weeks	517	11%	432	14%
>6 weeks and <= 8 weeks	425	9%	297	9%
>8 weeks and <= 10 weeks	385	8%	196	6%
>10 weeks and <= 12 weeks	295	6%	154	5%
> 12 weeks	1398	30%	627	20%

4.3 Delays between referral, admission and surgery

Comment:

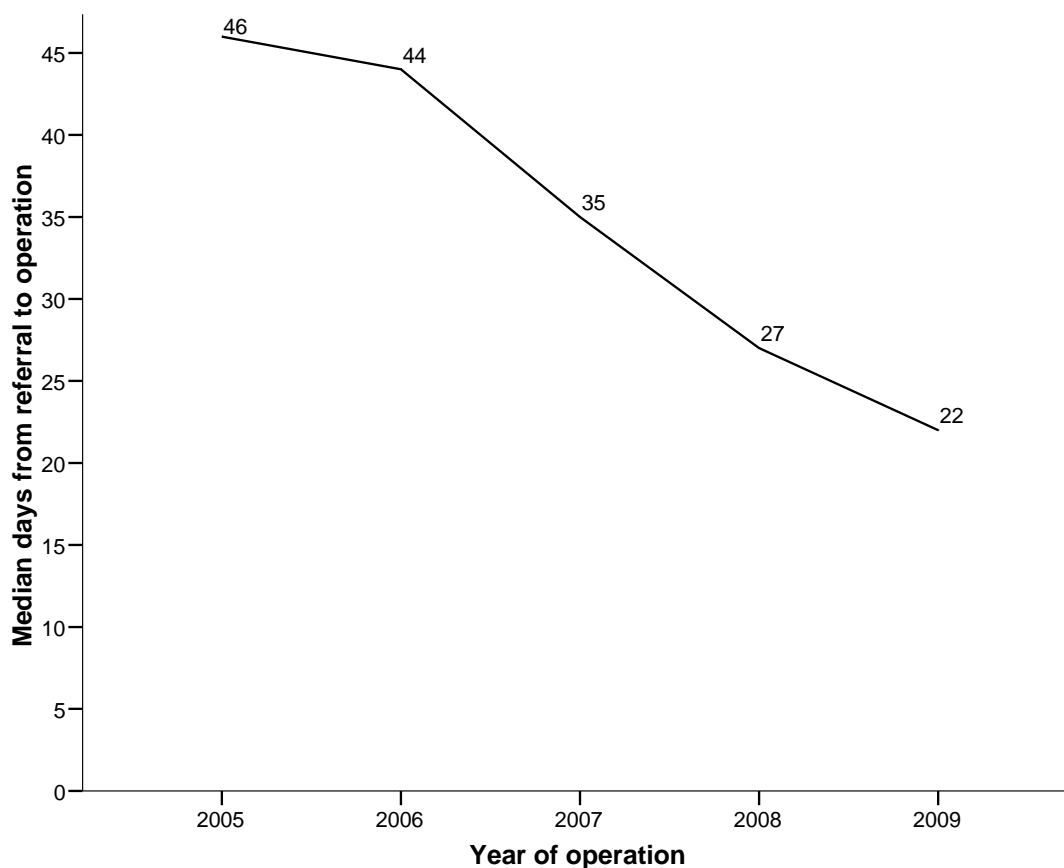
There is very little delay between admission and surgery.

Table 12 Time from referral, admission and surgery (days)

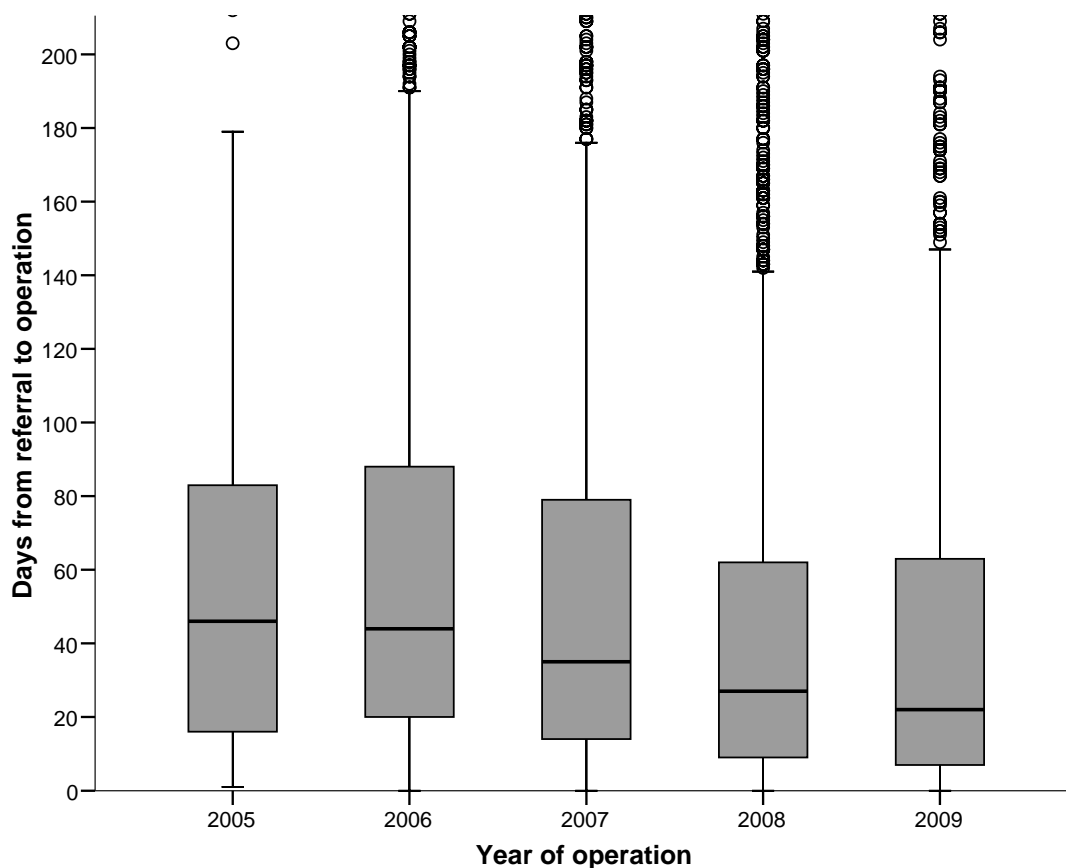
		Round 1 (5513 cases)	Round 2 (4443 cases)
Time from referral (Q3.1) to admission (Q1.11)	N	5508 (5 missing)	4089 (354 missing)
	Median	39 (Days)	27* (Days)
	IQR	15-83 (Days)	9-66 (Days)
Time from admission (Q11.1) to operation (Q1.1)	N	5512 (1 missing)	4443
	Median	1 (Days)	1 (Days)
	IQR	1-1 (Days)	1-1 (Days)
Time from referral (Q3.1) to operation (Q1.1)	N	5508 (5 missing)	4436 (7 missing)
	Median	40 (Days)	26 (Days)
	IQR	17-84 (Days)	8-62 (Days)

*The median time from referral to admission appears longer than the time from to operation because questionable admission dates were excluded from the analyses. E.g. in-patient referrals.

Graph 6 Median time from referral to operation (days)



Graph 7 Time from referral to operation (days)



There is some evidence of a marked downward trend in waiting times from referral to operation.

5. Referral for CEA

5.1 Referral sources for CEA operation

Comment:

Stroke physicians are playing an increasingly important part in the assessment of patients with TIA. 50% of referrals for CEA are now coming from stroke physicians and only 8% from neurologists.

In Round 2 we are asking if a patient has been referred from another Trust. This could be a means of tracking changes in commissioning of vascular services within a locality.

Table 13

Q3.2 Who referred the patient to the team under whose care the procedure was performed?	Round 1 (5513 cases)		Round 2 (4441 cases ,2 missing)	
	N	%	N	%
GP	701	13%	450	10%
Neurologist	596	11%	359	8%
Stroke physician	2117	38%	2238	50%
Care of Elderly consultant	717	13%	492	11%
Other	1382	25%	872	20%

6. Pre-operative drug therapy

Table 14

Q10.1 Was the patient on anti-platelet/thrombotic treatment prior to procedure?	Round 1 (5513 cases)		Round 2 (4442 cases, 1 missing)	
	N	%	N	%
% Yes	5378	98%	4298	97%

7. Operation details

Comment:

There has been little change in these data since Round 1. More comprehensive data will be provided in the Round 2 report.

7.1 Time in theatre (Length of operation)

Table 15 – Time spent in theatre

Time in theatre (minutes)	Round 1 (5513 cases)	Round 2 (4443 cases)
N	5108	4361
Median	116	120
IQR	90-140	100-150

7.2 Mode of anaesthetic

Table 16 Type of anaesthetic used

Q12.7 Type of anaesthetic	Round 1 (5512 cases, 1 missing)		Round 2 (4441 cases, 2 missing)	
	N	%	N	%
General (GA)	2735	50%	2286	51%
Local / Block (LA)	2777	50%	2120	48%
Started with LA, switched to GA	Not asked	Not asked	35	1%

8. Outcomes

Comment:

The number of patients in this interim analysis is too small to justify comment on the surgical outcomes including post operative stroke and death rates, particularly as only about half of all cases for the time period have thus far been submitted to the audit. These will be reported in the Round 2 report in March 2010 along with HES outcome data.

8.1 Length of stay in hospital (days)

Comment: *Length of stay in hospital remains unchanged since Round 1.*

Table 17 Length of stay (days)

	Round 1 (5513 cases, 30 missing)	Round 2 (4443 cases, 81 missing)
N	5483	4362
Median	3 (Days)	3 (Days)
IQR	2-4 (Days)	2-5 (Days)

PHASE 2 - MANAGEMENT OF PATIENTS AFTER HOSPITAL DISCHARGE

From this point on, the denominator of the total number of cases changes because at 30th June follow-up data were not available for all cases.

Of the 4443 Round 2 cases, follow-up data were completed for 3639/4443 (82%) cases.

9. Patient status at 30 days post CEA

Table 18 30-day mortality

	Round 1 (4964 cases, 20 missing)		Round 2 (3639 cases, 71 missing)	
	N	%	N	%
The patient died following discharge and within 30 days of the operation	51/4944	1.0%	30/3568	0.8%

10. Patient follow-up to assess surgical outcome

10.1 Access to follow-up appointments

Table 19 Access to and attendance of appointments

Access to follow-up appointments	Round 1 (4964 cases, 146 missing)		Round 2 (3639 cases)	
	N	%	N	%
Offered an appointment? (Yes)	4593/4818	95%	3445/3572 (67 missing)	96%
Attended the appointment (Yes)	4404/4593	96%	3275/3424 (21 missing)	96%

10.2 Time to post operative follow-up appointment

Table 20 Time between hospital discharge and follow-up appointment

Time from discharge (Q16.2) to follow-up (Q19.2)	Round 1 (4404 attendees)	Round 2 (3275 attendees)
N cases	4401 (3 missing)	3253 (22 missing)
Median (Days)	47	46
IQR (Days)	38-62	36-61

10.3 Specialty of professional assessing patients at post operative follow-up

The referral source may influence the specialty of the professional that assesses the patient postoperatively.

Table 21 Professional specialty of assessor

Q19.3 Specialist who assessed the patient at follow-up	Round 1 (4391 attendees, 13 missing)		Round 2 (3265 attendees, 10 missing)	
	N	%	N	%
Surgeon	3586	82%	2776	85%
Neurologist	72	2%	86	3%
Stroke Physician	171	4%	170	5%
Care of the Elderly Consultant	89	2%	52	2%
Cardiologist	473	11%	16	0.5%

10.4 Post-operative drug therapy

Comment: *It is a bit surprising that only 89% of patients are on an antithrombotic at follow-up and only 83% on a statin. There must be few instances where these drugs are not indicated as the vast majority of surgery on carotids is performed for atheromatous disease.*

Table 22 Post-operative drug therapy

Q19.5 Post-operative drug therapy	Round 1 (4964 cases)		Round 2 (3639 cases)	
	N	%	N	%
Anti-thrombotic	4499	91%	3225	89%
Statin	4158	84%	3008	83%
Beta-blocker	1054	21%	656	18%

Conclusion

This interim report shows an encouraging trend of reduction in delays to surgery for stroke and TIA patients. There is also an encouraging increase in participation rates since Round 1. Nevertheless comparison with HES data indicate that submission rates need to increase further in time for the final report in March 2010 in order to ensure that this is a representative audit of UK practice. The March 2010 report will contain a lot more data and key indicators will be reported at named trust-level.

APPENDIX 1a – ROUND 1 PROFORMA

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

PHASE 1

Section 1: Demographics [Questions 1.1,1.2,1.3, 1.5,1.6,1.7 are mandatory] [You will not be able to proceed on the web tool if these items are missing]

- 1.1 Date of operation: [dd/mm/yyyy]
- 1.2 Hospital code: [Unique hospital code allocated at registration]
- 1.3 Hospital name: [Name of hospital where the patient underwent CEA]
- 1.4 Consultant No: [Unique consultant code allocated at registration]
- 1.5 Date of birth: [Allocate the patient a number between 1-999. NB Each number can only be allocated once]
- 1.6 Patient audit number: [Allocate a number between 1-999. Each number can only be allocated once]
- 1.7 Gender: Male Female
- 1.8 Ethnicity:

British White	British Black	British Asian	British
Other Black Caribbean	Black African	Indian	Pakistani
Bangladeshi	African	Any other black background	Any other Asian background

 [Select 1 option]
- 1.9 Inter-rater case Yes No [Select Yes if the record is a double entry (reliability/quality check)]

Section 2: Admission [Questions 2.1, 2.2 are mandatory & must be completed before the record can be submitted]

- 2.1 Date of admission under surgeon: [dd/mm/yyyy]
- 2.2 Mode of admission: Elective Emergency Unplanned Transfer
[Can select >1 option. If 'Transfer', you can also specify whether it was 'Unplanned' or 'Emergency'. If 'Elective' the rest of the options are automatically disabled]

Section 3: Medical history [Questions 3.2 is mandatory & must be completed before the record can be submitted]

- 3.1 Diagnosed Diabetic: Yes No
- 3.2 Any current symptoms of ischaemic heart disease, congestive heart failure or treatment for it? Yes No
[e.g. angina]
- 3.3 Smoker: Yes No
- 3.4 Hypertension: Yes, Treated Yes, Untreated No

Section 4: Referral to surgeon [Questions 4.1, 4.2 are mandatory & must be completed before the record can be submitted]

- 4.1 Who referred the patient to the surgeons?
 General Practitioner Neurologist Stroke Physician Care of the Elderly Consultant Other
[If NOT 'Other' go to 4.2]
- 4.1a If other referrer, specify
- 4.2 Date of referral to surgeons: [dd/mm/yyyy]

Key Green – Data item required for the NVD only Black – Data item required for both projects (UKCEAA & NVD)	Blue – date item required for the UKCEAA only Grey – Text to give instructions on how to navigate the questionnaire or other help notes
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UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

Section 5: Indications that triggered referral [Questions 5.1 is mandatory & must be completed before the record can be submitted]

5.1 Was the patient symptomatic for carotid disease? Yes No
[[if 'No', go to 5.4]

5.2 If yes, what was the symptom that triggered referral for surgery? [Select the index symptom only]

Amaurosis fugax Transient ischaemic attack Stroke None of these

5.2a Specify timing of symptom that triggered referral for surgery [Select timing of the index symptom]

<1week 1-2weeks 3-4weeks 5-7weeks 8-12weeks >12weeks

5.3 Pre coronary artery bypass graft/heart valve surgery? Yes No

5.4 Other relevant indication(s) [specify]

Section 6: Initial carotid/brain imaging that triggered referral [Questions 6.1 is mandatory & must be completed before the record can be submitted]

6.1 Date of initial carotid imaging that triggered referral: [dd/mm/yyyy]

6.1a Specify imaging modality used (for initial carotid imaging):

Duplex Magnetic resonance angiogram Catheter angiogram

Computerised tomography angiogram Not documented

6.1b Grade of ipsilateral carotid stenosis:

<50% 50%-69% 70%-89% 90%-99%

6.1c Grade of contralateral carotid stenosis:

Not done <50% 50%-69% 70%-89% 90%-99% Occluded

6.2 Has the patient had pre-operative brain imaging?

Yes, magnetic resonance imaging only Yes, computerised tomography only

Yes, magnetic resonance imaging & computerised tomography No

Section 7: Confirmatory carotid imaging

7.1 Has the patient had confirmatory carotid imaging pre-operatively? Yes No [If 'No' go to 8.1]

7.1a If yes, give date of confirmatory carotid imaging: [dd/mm/yyyy]

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

7.1b Specify imaging modality (for confirmatory carotid imaging):

Duplex Magnetic resonance angiogram Catheter angiogram Computerised tomography

7.1c Grade of confirmatory ipsilateral carotid stenosis:

<50% 50%-69% 70%-89% 90%-99%

7.1d Grade of confirmatory contralateral carotid stenosis:

Note done <50% 50%-69% 70%-89% 90%-99% Occluded

Section 8: Most recent symptoms [Question 8.2 is mandatory & must be completed before the record can be submitted]

8.1 Timing of most recent symptom (prior to surgery):

<1 week 1 week >1≤2weeks >2≤4 weeks >4≤6weeks
 >6≤8weeks >8≤10weeks >10≤12weeks >12weeks

8.2 Rankin score immediately pre-operatively [From the list below circle the appropriate option]

Rankin score

- Asymptomatic
- Non-disabling symptoms, no interference with lifestyle
- Minor disability, some restriction in lifestyle but does not interfere with patient's capacity to look after self
- Moderate disability, symptoms significantly interfere with lifestyle or prevent totally independent existence
- Moderately severe, symptoms prevent independent existence but patient does not need attention for 24hrs
- Severely disabled, totally dependent day and night

Section 9: Previous carotid interventional procedures [Question 9.1, 9.2 are mandatory & must be completed before the record can be submitted]

9.1 Previous ipsilateral carotid surgery: Yes No

9.2 Previous ipsilateral carotid angioplasty: Yes No

Section 10: Pre-operative tests [All the questions in this section are mandatory. They are required for risk adjustment.]

10.1 Normal electrocardiogram (ECG): Yes No [If 'Yes', go to 10.2]

10.1a Atrial fibrillation 60-90: Yes No Not documented

10.1b Atrial fibrillation greater than 90: Yes No Not documented

10.1c >5 ectopics/min: Yes No Not documented

10.1d Q wave or ST/T wave changes: Yes No Not documented

10.1e Any other abnormal rhythm or change:

10.2 Systolic blood pressure (mmHg): Not documented

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

- | | | | |
|-------|--|----------------------|--------------------------------------|
| 10.3 | Pulse (per min): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.4 | Haemoglobin (g/dl): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.5 | White blood cell count (10 ⁹ /L): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.6 | Urea (mmol/L): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.7 | Creatinine (mmol/L): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.8 | Sodium (mmol/L): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.9 | Potassium (mmol/L): | <input type="text"/> | Not documented <input type="radio"/> |
| 10.10 | INR: | <input type="text"/> | Not documented <input type="radio"/> |

Section 11: Pre-operative drug therapy [Question 11.1 is mandatory & must be completed before the record can be submitted]

- 11.1. Was the patient on anti-thrombotic drugs prior to surgery? Yes No [If 'No', go to 11.7]
- 11.2. Is the patient normally on ASPIRIN? Yes No [If 'No', go to 11.3]
- 11.2a Was ASPIRIN stopped prior to surgery? Yes No [If 'No', go to 11.3]
- 11.2b If ASPIRIN was stopped, specify the number of days it was stopped prior to surgery days
- 11.3 Is the patient normally on CLOPIDOGREL? Yes No [If 'No', go to 11.4]
- 11.3a Was CLOPIDOGREL stopped prior to surgery? Yes No [If 'No', go to 11.4]
- 11.3b If CLOPIDOGREL was stopped, specify the number of days it was stopped prior to surgery days
- 11.4 Is the patient normally on DIPYRIDAMOLE? Yes No [If 'No', go to 11.6]
- 11.4a Was DIPYRIDAMOLE stopped prior to surgery? Yes No [If 'No', go to 11.6]
- 11.4b If DIPYRIDAMOLE was stopped, specify the number of days it was stopped prior to surgery days
- 11.5 Is the patient normally on WARFARIN? Yes No [If 'No', go to 11.6]
- 11.5a Was WARFARIN stopped prior to surgery? Yes No [If 'No' is selected, go to 11.6]
- 11.5b If WARFARIN was stopped, specify the number of days it was stopped prior to surgery days
- 11.6 The patient is on NONE of these anti-thrombotic drugs [11.6 is automatically disabled if patient is on any of the listed drugs]
- 11.7 Was the patient on statin therapy prior to surgery? Yes No
- 11.8 Was the patient on beta-blocker therapy prior to surgery? Yes No

Key Green – Data item required for the NVD only Black – Data item required for both projects (UKCEAA & NVD)	Blue – date item required for the UKCEAA only Grey – Text to give instructions on how to navigate the questionnaire or other help notes
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UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

Section 12: Operation details

[Questions 12.1, 12.5, 12.7, 12.8 are mandatory & must be completed before the record can be submitted]

12.1 Date of operation: [dd/mm/yyyy] [NB 12.1 will be automatically populated with the date given in 1.1]

12.2 Which carotid artery was operated on? Left Right

12.3 Start time (hrs:mins): : Not documented

12.4 Finish time (hrs:mins) : : Not documented

12.5 Grade of most senior surgeon scrubbed:

Consultant Non consultant career grade (NCCG) Specialist registrar (SpR)

12.6 Type of surgery: Elective Unplanned Emergency

[NB If "Unplanned", you can also specify whether it "Emergency" and vice versa]

12.7 What type of anaesthetic was used? General Local/Block

12.8 Grade of most senior anaesthetist in theatre:

Consultant Non consultant career grade (NCCG) Specialist registrar (SpR)

12.9 Lowest systolic blood pressure (mmHg) :

12.10 Highest pulse at time of surgery:

Section 13: Procedure specific operative data

13.1 Was a carotid shunt used? Yes No [NB Excludes ATTEMPTED shunting]

13.2 Type of endarterectomy: Standard Eversion Other [If NOT 'Other', go to 13.3]

13.2a Specify other type of carotid endarterectomy:

13.3 Was a carotid patch used? Yes No

13.4 Were distal tacking sutures used? Yes No

13.5 Was heart surgery undertaken synchronously? Yes No

Section 14: Destination immediately post-operatively

14.1 Where was the patient admitted immediately post-operatively?

Intensive care unit High dependency unit Level 1 care unit Ward

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

Section 15: Complications [Questions 15.1, 15.2, 15.4, 15.5 are mandatory & must be completed before the record can be submitted]

15.1 Did the patient suffer any complications during inpatient stay? Yes No [If 'No' is selected, go to 16.1]

15.2 Did the patient die during inpatient stay? Yes No [If 'No' is selected, go to 15.3]

15.2a If yes, give the date that the patient died: [dd/mm/yyyy]

15.2b Specify the cause of death:

15.3 Did the patient have a myocardial infarct? Yes No

15.4 Did the patient return to theatre for bleeding? Yes No

15.5 Did patient have perioperative stroke? Yes No [If 'No' is selected, go to 15.6]

[NB If the patient had >1 perioperative stroke, the answer given in 15.5a should reflect the timing of the FIRST perioperative stroke]

15.5a If yes, specify timing of perioperative stroke: ≤ 24 hrs of operation >24 hrs and prior to discharge
[If ' ≤ 24 hrs of operation', go to 15.5b] [If ' >24 hrs of operation', go to 15.5c]

15.5b Severity of perioperative stroke ≤ 24 hrs: [From the list below circle the appropriate option]

Rankin Score
<ul style="list-style-type: none">AsymptomaticNon-disabling symptoms, no interference with lifestyleMinor disability, some restriction in lifestyle but does not interfere with patient's capacity to look after selfModerate disability, symptoms significantly interfere with lifestyle or prevent totally independent existenceModerately severe, symptoms prevent independent existence but patient does not need attention for 24hrsSeverely disabled, totally dependent day and night

15.5c Severity of perioperative stroke >24 hrs: [From the list below circle the appropriate option]

Rankin Score
<ul style="list-style-type: none">AsymptomaticNon-disabling symptoms, no interference with lifestyleMinor disability, some restriction in lifestyle but does not interfere with patient's capacity to look after selfModerate disability, symptoms significantly interfere with lifestyle or prevent totally independent existenceModerately severe, symptoms prevent independent existence but patient does not need attention for 24hrsSeverely disabled, totally dependent day and night

15.6 Cranial nerve injury: Yes No

15.7 Other complication(s), specify:

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

Section 16: Final discharge data [Questions 16.2, 16.4 are mandatory & must be completed before the record can be submitted]

16.1 Date patient was discharged by surgeons: [dd/mm/yyyy]

16.2 Date patient was discharged from hospital: [dd/mm/yyyy]

16.3 Discharge Destination:

Usual place of residence Nursing Home Residential Home Other Hospital Other

[If NOT 'Other', go to 16.4]

16.3a Other discharge destination, specify:

16.4 What was the Rankin score at hospital discharge? [From the list below circle the appropriate option]

Rankin Score

- Asymptomatic
- Non-disabling symptoms, no interference with lifestyle
- Minor disability, some restriction in lifestyle but does not interfere with patient's capacity to look after self
- Moderate disability, symptoms significantly interfere with lifestyle or prevent totally independent existence
- Moderately severe, symptoms prevent independent existence but patient does not need attention for 24hrs
- Severely disabled, totally dependent day and night

The free text box below is for comments regarding the answer(s) given to any question(s) in Sections 1-16 if required. For each comment given, specify the question number to which it applies.

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

PHASE 2

Section 17: Patient status at 30days post-operatively

[Questions 17.1 is Mandatory & must be completed before the record can be submitted]

17.1 Was the patient alive at 30days post-operatively? Yes No [If 'Yes' is selected, go to 18.1]

17.1a If no, give date patient died [dd/mm/yyyy]

17.1b Indicate whether the cause of death is known: Unknown Known [If 'Unknown' is selected, go to 18.1]

17.1c Specify the cause of death:

Section 18: Post-operative follow-up attendance

[Questions 18.1, 18.2, 18.3 are mandatory & must be completed before the record can be submitted]

18.1 Was the patient offered a post-operative follow-up appointment? Yes No [If 'No', go to the free text box after section 19]

18.2 If yes, did the patient attend post-operative follow-up appointment? Yes Did not attend [If 'Did not attend', go to 18.2a]

18.2a If patient did not attend, specify reason: [After 18.2a, go to the free text box after section 19]
Patient cancelled Clinic cancelled DNA – no advance warning
DNA-left without being seen DNA-arrived late Other

18.3 Give date patient attended post-operative follow-up: [dd/mm/yyyy]

18.4 Specify specialty of professional that assessed the patient:

Surgeon Neurologist Stroke Physician Care of the elderly Consultant Combination Other
[If NOT 'Other', go to 19.1]

18.4a If other clinician, specify specialty: [] [e.g. Vascular SpR]

Section 19: Post-operative follow-up data

[19.1– 19.5 are mandatory & must be completed before the record can be submitted]

19.1 Did the patient return to theatre <30days after operation? Yes No [NB 19.1 will be automatically populated with the value given in 15.4]

19.2 Was evidence of cranial nerve injury found at follow-up? Yes No

19.3 Has the patient had a stroke since discharge? Yes No [If 'No', go to 19.4]

19.3a If yes, specify date patient suffered stroke: [dd/mm/yyyy]
[NB If only year/month (mm/yyyy) is available, (dd) should be entered as 15th]

19.4 Rankin score at this visit (follow-up): [From the list below circle the appropriate option]

Rankin Score

- Asymptomatic
- Non-disabling symptoms, no interference with lifestyle
- Minor disability, some restriction in lifestyle but does not interfere with patient's capacity to look after self
- Moderate disability, symptoms significantly interfere with lifestyle or prevent totally independent existence
- Moderately severe, symptoms prevent independent existence but patient does not need attention for 24hrs
- Severely disabled, totally dependent day and night

UK CAROTID ENDARTERECTOMY (UKCEAA) – CLINICAL AUDIT DATASET

[Insert date of birth]

[Insert patient audit no.]

[Insert gender]

[For your reference only, insert patient's local Hospital No.]

19.5 What drug therapy is the patient on post-operatively? Anti-thrombotic Statin Beta-blocker
[If NOT on 'Anti-thrombotic', go to the free text box after section 19]

19.5a If the patient is on anti-thrombotic drug(s) specify which one(s) [Tick all appropriate drugs]

Aspirin Clopidogrel Dipyridamole Warfarin

The free text box below is for comments the regarding the answer(s) given to any question(s) in Sections 17-19 if required.
For each comment given, specify the question number to which it applies.

APPENDIX 1b – ROUND 2 PROFORMA

Phase 1 [Referral to hospital discharge]

Section 1: Demographics

- 1.1 Date procedure was undertaken: _____ [DD/MM/YYYY]
[Date entered should be from 1st Dec 2005 onwards]
- 1.1a **New!** Was this procedure successfully completed? Yes Abandoned *[Tick 1 option only]*
[If Yes, go to 1.2] [If Abandoned, 1.1b must be completed]
[NB This form still needs to be completed even if the procedure was abandoned]
- 1.1b **New!** If procedure was Abandoned, give reason: _____
- 1.2 RCP surgeon code: _____
[On the web tool, this field is filled automatically if an individual login was used to access the web tool. If a 'unit admin' login was used, the relevant code must be selected from a drop down menu] [3 digits]
- 1.2a **New!** GMC Number: _____
[On the web tool, this field is filled automatically once Q1.2 is filled] [7 digits]
- 1.3 Hospital name: _____
[On the web tool, this field is filled automatically if the surgeon or radiologists performs carotid procedures at 1 hospital only, otherwise the relevant hospital name must be selected manually from a drop down menu] [Describes hospital where the procedure was performed]
- 1.4 RCP Hospital code: _____
[On the web tool, this field is filled automatically] once Q1.3 [3 digits]
- 1.5 Date of birth: _____ [DD/MM/YYYY]
- 1.6a Patient code: _____
[Describes a random number (up to 3 digits) that you give to the patient for anonymity]
- 1.6b **New!** Patient hospital number: _____
[On the web tool, this field is visible to hospital staff only] [Describes the identifier that is on the patient's local hospital records]
- 1.7 Gender: Male Female *[Tick 1 option only]*
- 1.9 Ethnicity: *[Tick 1 option only]*
- | | | |
|-------------------------------|-----------------------|---|
| White | <input type="radio"/> | British, Irish, Any other white background |
| Mixed | <input type="radio"/> | White and Black Caribbean, White and Black African, White and Asian, Any other Mixed background |
| Asian or Asian British | <input type="radio"/> | Indian, Pakistani, Bangladeshi, Any other Asian background |
| Black or Black British | <input type="radio"/> | Caribbean, African, Any other Black background |
| Chinese or other ethnic group | <input type="radio"/> | Chinese, Any other |
- 1.10 **New!** Which of the following procedures was performed? *[Tick 1 option only]*
 Surgical carotid endarterectomy Angioplasty/stent Combined CEA and angioplasty/stent
[If Surgical carotid endarterectomy is selected, ignore 13.1 to 13.1b and 13.10 to 13.12]
[If Angioplasty/stent is selected, ignore 12.3a and 13.4 to 13.9]
[If Combined CEA & angioplasty/stent is selected, ignore 13.1 to 13.2a]
- 1.11 Date patient was admitted to this Hospital in **this episode** of care: _____ [DD/MM/YYYY]
[Date entered CANNOT be after date of procedure (1.1) but can be EQUAL to date of procedure (1.1)]

Section 2: Risk Factors

- 2.1 Diagnosed Diabetic: Yes No [Tick 1 option only]
- 2.2 Any current symptoms of or treatment for ischaemic heart disease or congestive heart failure?
Yes No [Tick 1 option only]
- 2.3 **New!** Known peripheral arterial vascular disease (symptoms or previous intervention) Yes No
- 2.4 Pre-operative blood pressure (e.g. taken on day or prior to surgery or in clinic):
Systolic BP (mmHg): [] [Min= 20, Max=350]
New! Diastolic BP (mmHg): [] [Min= 20, Max=350]

Section 3: Referral to surgeons

- 3.1 Date of referral to team under whose care surgery or angioplasty/stenting was undertaken: _____ [DD/MM/YYYY]
[Date entered can be from 1st Dec 2003 onwards but CANNOT be after date of procedure (1.1)]
- 3.1a **New!** Date patient was first seen by team under whose care surgery or angioplasty/stenting was undertaken: [DD/MM/YYYY]
[Date entered can be from 1st Dec 2003 onwards but CANNOT be after date of procedure (1.1)]
- 3.2 Who referred the patient to the team under whose care surgery or angioplasty/stenting was undertaken? [Tick 1 option only]
General Practitioner Neurologist Stroke Physician **New!** Radiologist
Care of the Elderly Consultant **New!** Vascular Surgeon **New!** Cardiologist/Cardiothoracic surgeon
New! Ophthalmology **New!** Self referral **New!** Other Surgeon Other
[If NOT Other, go to 3.3] [If Other, 3.2a must be completed]
- 3.2a If answered *Other* to 3.2, specify: _____
- 3.3 **New!** Was the patient referred from another Trust? Yes No [Tick 1 option only]

Section 4: Indications that triggered referral

- 4.1 Was the patient symptomatic for carotid disease? Yes No [Tick 1 option only]
[If 'No', ignore 4.1a to 4.1d and 7.1.]
[If 'Yes', ignore 4.1e and 4.1a or 4.1b and 4.1c must be completed]
- 4.1a **New!** If 'Yes', give the date the patient experienced the symptom that triggered referral for surgery or angioplasty/stent:
_____ [DD/MM/YYYY] [If date is given, go to 4.1c]
[Date entered can be from 1st Dec 2000 onwards but CANNOT be after date of procedure (1.1)]
Date not known [If this option is selected 4.1b must be completed]
- 4.1b **New!** If Date Not known, estimate the time between the date the patient experienced the symptom and the date that the initial referral for surgery or angioplasty/stent was made: [Tick 1 option only]
1-2 days 3-7 days 8-14 days 15-21 days 22-28 days >28 days
- 4.1c What was the symptom that triggered referral for surgery or angioplasty/stent? [Tick 1 option only]
[NB only the INDEX symptom is required even if the patient had other symptoms]
Amaurosis fugax Transient ischaemic attack Stroke
New! Chronic cerebral hypoperfusion **New!** Other [If Other is selected, 4.1d must be completed]
- 4.1d **New!** If answered *Other* to 4.1c, specify:

- 4.1e **New!** If 'No' to 4.1, is CEA or angioplasty/stent being undertaken prior to major surgery (e.g. CABG) or as part of randomised trial? [Tick 1 option only]
Major surgery (e.g. CABG) Randomised trial Neither of these

Section 5: DIAGNOSTIC carotid imaging [i.e. Imaging that identified ICA stenosis requiring treatment]

- 5.1 Date of the initial DIAGNOSTIC carotid imaging that identified ICA stenosis requiring treatment: _____
 [DD/MM/YYYY] [Date entered can be from 1st Dec 2003 onwards but CANNOT be after date of procedure (1.1)]
- 5.2 Specify imaging modalities used on date given in 5.1: [Select at least 1 option]
 Duplex MR angiogram Catheter angiogram CT angiogram Other or Not documented
- 5.2a Grade of ipsilateral carotid stenosis (based on NASCET criteria): [Tick 1 option only]
 [Describes measurement used to identify suitability for intervention]
 <50% 50%-69% 70%-89% 90%-99% Occluded
- 5.2b Grade of contralateral carotid stenosis (based on NASCET criteria): [Tick 1 option only]
 Not done <50% 50%-69% 70%-89% 90%-99% Occluded
- 5.3 **New!** Has the patient had further pre-operative carotid imaging after initial scan, to confirm diagnosis? [Tick 1 option only]
 Yes No [If No, go to 6.1] [If Yes, 5.3a must be completed]
- 5.3a **New!** Date patient had further pre-operative carotid imaging after initial scan, to confirm diagnosis: _____
 [DD/MM/YYYY] [Date entered MUST be BEFORE date of procedure (1.1)]
- 5.3b **New!** Specify imaging modalities used on date given in 5.3a: [Select at least 1 option]
 Duplex MR angiogram Catheter angiogram CT angiogram Other or Not documented
- 5.3c **New!** If answered Yes to 5.3, specify grade of ipsilateral carotid stenosis (based on NASCET criteria):
 <50% 50%-69% 70%-89% 90%-99% Occluded
- 5.3d **New!** If answered Yes to 5.3, did the patient have a string sign (with a collapsed ICA)? Yes No
- 5.3e **New!** If answered Yes to 5.3, specify grade of contralateral carotid stenosis (based on NASCET criteria): [Tick 1 option only]
 Not done <50% 50%-69% 70%-89% 90%-99% Occluded

Section 6: Most recent carotid imaging prior to undergoing this surgery or angioplasty/stent

- 6.1 **New!** Has the patient had further pre-operative carotid imaging to confirm patency immediately prior to surgery or angioplasty/stent?
 Yes No [If No, go to 7.1] [If Yes, 6.1a must be completed]
- 6.1a **New!** If answered Yes to 6.1, give date of pre-operative imaging to confirm patency prior to surgery or angioplasty/stent:
 _____ [DD/MM/YYYY] [Date entered MUST be ON or BEFORE date of procedure (1.1)]

Section 7: Function prior to undergoing this surgery or angioplasty/stent

7.1 **New!** Give date of the most recent ISCHAEMIC event prior to surgery or angioplasty/stent: _____ [DD/MM/YYYY]
[Date entered can be from 1st Dec 2003]

7.2 Rankin score immediately pre-operatively or prior to angioplasty/stent: [Tick 1 option only]

- 0 Asymptomatic
- 1 Non-disabling symptoms no interference with lifestyle
- 2 Minor disability some restriction in lifestyle but does not interfere with patient's capacity to look after self
- 3 Moderate disability symptoms significantly interfere with lifestyle or prevent totally independent existence
- 4 Moderately severe symptoms prevent independent existence but patient does not need attention 24hrs
- 5 Severely disabled totally dependent day and night

Section 8: Previous carotid interventional procedures

8.1 Previous ipsilateral carotid surgery: Yes No [Tick 1 option only]

8.2 Previous ipsilateral carotid angioplasty or stent: Yes No [Tick 1 option only]

Section 9: Tests prior to undergoing this surgery or angioplasty/stent

9.1 Creatinine: [] (mmol/L) [Min=5 Max=1000]

Section 10: Drug therapy prior to undergoing this surgery or angioplasty/stent

- 10.1 Was the patient on anti-platelet/thrombotic treatment prior to surgery or angioplasty/stent? Yes No
[If No, go to 10.3] [If Yes, 10.2 must be completed]
- 10.2 Which of the following drugs was the patient taking prior to surgery or angioplasty/stent: *[Select at least 1 option]*
 Aspirin Clopidogrel Dipyridamole Warfarin **New!** Other
[If Aspirin is NOT selected, ignore 10.2a & 10.2b] [If Clopidogrel is NOT selected, ignore 10.2c & 10.2d]
[If Dipyridamole is NOT selected, ignore 10.2e & 10.2f] [If Warfarin is NOT selected, ignore 10.2g & 10.2h]
- 10.2a Was ASPIRIN stopped prior to surgery or angioplasty/stent? Yes No *[If No, ignore 10.2b]*
- 10.2b If ASPIRIN was stopped, specify the number of days it was stopped prior to surgery or angioplasty/stent:
 [] *[Days]*
- 10.2c Was CLOPIDOGREL stopped prior to surgery or angioplasty/stent? Yes No *[If No, ignore 10.2d]*
- 10.2d If CLOPIDOGREL was stopped, specify the number of days it was stopped prior to surgery or angioplasty/stent:
 [] *[Days]*
- 10.2e Was DIPYRIDAMOLE stopped prior to surgery or angioplasty/stent? Yes No *[If No, ignore 10.2f]*
- 10.2f If DIPYRIDAMOLE was stopped, specify the number of days it was stopped prior to surgery or angioplasty/stent:
 [] *[Days]*
- 10.2g Was WARFARIN stopped prior to s surgery/angioplasty/stent Yes No *[If No, ignore 10.2h]*
- 10.2h If WARFARIN was stopped, specify the number of days it was stopped prior to surgery or angioplasty/stent:
 [] *[Days]*
- 10.3 Was the patient on statin therapy prior to surgery or angioplasty/stent? Yes No *[Tick 1 option only]*
- 10.4 Was the patient on beta-blockers therapy prior to surgery or angioplasty/stent? Yes No *[Tick 1 option only]*

Section 11: Delay to surgery or angioplasty/stent

- 11.1 **New!** If elapsed time between the symptom that triggered referral and surgery or angioplasty/stent is greater than 2 weeks, specify reason(s):

[Select at least 1 option]

[If Other is NOT selected, ignore 11.1a]

Delay in presentation	<input type="checkbox"/>	Limited availability of surgeon	<input type="checkbox"/>	Other	<input type="checkbox"/>
Delay in referral	<input type="checkbox"/>	Limited availability of anaesthetist	<input type="checkbox"/>		
Delay in carotid imaging	<input type="checkbox"/>	Limited availability of radiologist	<input type="checkbox"/>		
Patient cancellation/delay - unfit	<input type="checkbox"/>	Lack of operating time	<input type="checkbox"/>		
Patient cancellation/delay – patient choice	<input type="checkbox"/>	Other case took priority	<input type="checkbox"/>		

- 11.1a **New!** If answered *Other* in 11.1, specify:

Section 12: Procedure details

- 12.1 Which carotid artery was treated? Left Right [Tick 1 option only]
- 12.2 Start time: [:] [Hours:Minutes]
- 12.3 Finish time: [:] [Hours:Minutes]
- 12.3a **New!** If length of procedure is <1hour or >3hours, give reason:

- 12.4 Grade of most senior surgeon in theatre: [Tick 1 option only] [If NOT Specialist registrar, go to 12.5]
Consultant Non consultant career grade Specialist registrar
- 12.4a **New!** If most senior surgeon in theatre was *Specialist registrar*, specify year of training: [Tick 1 option only]
Year 1 Year 2 Year 3 Year 4 Year 5
- 12.5 **New!** Was this a joint consultant operation with two consultant surgeons operating together? Yes No
- 12.6 Type of surgery: Elective Unplanned/Emergency [Tick 1 option only]
- 12.7 Type of anaesthetic used during surgery? General Local/Blocks **New!** Started with LA, switched to GA
- 12.8 Grade of most senior anaesthetist in theatre: [Tick 1 option only] [If NOT Specialist registrar, go to 13.1]
Consultant Non consultant career grade Specialist registrar
- 12.8a **New!** If most senior anaesthetist in theatre was *Specialist registrar*, specify year of training: [Tick 1 option only]
Year 1 Year 2 Year 3 Year 4 Year 5

Section 13: Specific procedure data [Complete Q13.1 to Q13.1b and 13.10 to 13.12 ONLY if the patient had angioplasty/stent]

13.1 **New!** If angioplasty/stent only performed was conventional was surgery an option? Yes No [Tick 1 option only]

13.1a **New!** Whose care was the patient under when they underwent angioplasty/stent? [If NOT Other, go to 13.2]

Vascular surgeon Neurosurgeon Radiologist Stroke Physician Other

13.1b **New!** If answered *Other* to 13.1a, specify: _____

13.2 **New!** Was this patient in a stenting versus surgery clinical trial? Yes No

13.2a **New!** If the patient was in a stenting versus surgery trial were they in ICSS or ACST-2? ICSS ACST-2

13.3 **New!** Pathology: [Select at least 1 option] [If NOT Other, ignore 13.3a]

Atherosclerosis Post endarterectomy restenosis Post radiotherapy Other

13.3a **New!** If answered *Other* to 13.3, specify: _____

13.4 Was a carotid shunt used? Yes No **New!** Attempted and abandoned [Tick 1 option only]

13.5 Type of endarterectomy: Standard Eversion [Tick 1 option only]

13.6 Was a carotid patch used? Yes No [Tick 1 option only]

13.7 Were distal tacking sutures used? Yes No [Tick 1 option only]

13.8 Was heart surgery undertaken synchronously? Yes No [Tick 1 option only]

13.9 **New!** Which of the following completion assessment techniques were used? [Select at least 1 option]
[If 'None', go to 14.1] [If NOT 'None', select at least 1 option]

None Angiography Duplex scan Angioscopy Hand-held Doppler

13.10 **New!** Site of angioplasty/stenting: [Select at least 1 option]

Carotid bifurcation (including proximal ICA) Distal ICA (below base of skull)

Common Carotid artery External Carotid artery

13.11 **New!** Procedure details: Angioplasty alone Stent Cerebral protection device [Select at least 1 option]

[If Stent is NOT selected, ignore 13.11a & 13.11b] [If Cerebral protection device is NOT selected, ignore 13.11c & 13.11d]

13.11a **New!** If answered *Stent* to 13.11, specify type: [Select at least 1 option] [If NOT Other, ignore 13.11b]

Abbott XAct Abbott Acculink Bard Vivax Boston Scientific Wallstent
Boston Scientific NEX stent Cordis Precise Invatec Cristallo Medtronic Exponent Other

13.11b **New!** If answered *Other* to 13.11a, specify: _____

13.11c **New!** If answered *Cerebral protection device* to 13.11, specify type: [Tick 1 option only] [If NO Other, ignore 13.11d]

Filter Flow reversal Proximal occlusion (MoMa) Distal occlusion (PercuSurge) Other

13.11d **New!** If answered *Other* to 13.11c, specify: _____

13.12 **New!** Grade of most senior radiologist performing intervention: [Tick 1 option only]

Consultant Non consultant career grade Specialist registrar

Section 14: Destination post-operatively or post angioplasty/stent

14.1 **New!** Time spent in recovery area: *[Tick 1 option only]*

None <4 hours >4 ≤ 12 hours >12 hours

14.2 Where was the patient admitted post-operatively or post angioplasty/stent (after any period in recovery)?

Intensive care unit High dependency unit Ward **New!** PACU *[Tick 1 option only]*

Section 15: Complications during inpatient stay

15.1 Did the patient suffer any complications during inpatient stay? Yes No *[If No, go to 15.6]*

15.1a **New!** If answered 'Yes to 15.1', which of the following complications did the patient experience? *[Select at least 1 option]*

Myocardial Infarct	<input type="checkbox"/>	Cranial nerve injury (includes neuropraxia)	<input type="checkbox"/>	Occlusion of treated carotid artery	<input type="checkbox"/>
Stroke	<input type="checkbox"/>	Heart Failure (includes cardiac arrhythmia)	<input type="checkbox"/>	Respiratory	<input type="checkbox"/>
TIA	<input type="checkbox"/>	Urinary	<input type="checkbox"/>	Thromboembolism related to the treated carotid artery	<input type="checkbox"/>
Amaurosis fugax	<input type="checkbox"/>	Cardiac arrest	<input type="checkbox"/>	Post-intervention hypertension	<input type="checkbox"/>
Bleeding	<input type="checkbox"/>	Fit	<input type="checkbox"/>	Other	<input type="checkbox"/>

[If Myocardial infarct is NOT selected, ignore 15.2]

[If TIA is NOT selected, ignore 15.4]

[If Other is NOT selected, ignore 15.1b]

[If Stroke is NOT selected, ignore 15.3, 15.3a, 15.3b, 15.3c & 15.3d]

[If Cranial nerve injury is NOT selected, ignore 15.5 & 15.5a]

15.1b If answered 'Other' to 15.1a, specify: _____

15.2 **New!** If the patient experienced a *myocardial infarct*, specify timing: *[Tick 1 option only]*

≤24hrs of undergoing procedure

>24hrs after undergoing procedure and prior to discharge

15.3 If the patient experienced a *stroke*, specify timing: *[Tick 1 option only]*

New! During procedure (woke up with a stroke)

≤24hrs of undergoing procedure

>24hrs after undergoing procedure and prior to discharge

[If During procedure (woke up with stroke) OR ≤24hrs of undergoing procedure ignore 15.3a]

[If >24hrs of undergoing procedure and prior to discharge 15.3a must be completed]

15.3a **New!** If patient experienced a stroke >24hrs after undergoing procedure and prior to discharge, give date patient of stroke:

_____ [DD/MM/YYYY] *[Date entered MUST be AFTER date of procedure (1.1)]*

15.3b **New!** Side of stroke: Side on which this procedure was done Contralateral side *[Tick 1 option only]*

15.3c Severity of stroke: *[Tick 1 option only]*

- 0 Asymptomatic
- 1 Non-disabling symptoms no interference with lifestyle
- 2 Minor disability some restriction in lifestyle but does not interfere with patient's capacity to look after self
- 3 Moderate disability symptoms significantly interfere with lifestyle or prevent totally independent existence
- 4 Moderately severe symptoms prevent independent existence but patient does not need attention 24hrs
- 5 Severely disabled totally dependent day and night

- 15.3d **New!** Give date the assessment in 15.3c was made: _____ [DD/MM/YYYY]
[Date entered must be on or after date procedure was undertaken (1.1)]
- 15.4 **New!** If patient experienced TIA, specify timing:
≤24hrs of undergoing procedure >24hrs after undergoing procedure and prior to discharge
- 15.5 **New!** If patient experienced *cranial nerve injury*, specify date injury was found: _____ [DD/MM/YYYY]
[Date entered must be on or after date procedure was undertaken (1.1)]
- 15.5a **New!** Affected cranial nerve (or branch): [Select at least 1 option]
Hypoglossal Facial Glossopharyngeal Vagus Recurrent laryngeal
- 15.6 **New!** Did the patient return to theatre for ANY reason during hospital stay? Yes No [If 'No', go to 15.7]
- 15.6a **New!** If answered Yes to 15.6, specify reason patient returned to theatre: [Select at least 1 option] [If NOT Other, go to 15.7]
Bleeding Stroke Thromboembolism related to the treated carotid artery Other
- 15.6b If answered *Other* to 15.6a, specify: _____
- 15.7 Did the patient die during inpatient stay? Yes No [Tick 1 option only]
[If No, go to 16.1]
- 15.7a If answered Yes to 15.7, give the date that the patient died: _____ [DD/MM/YYYY]
[Date entered must be equal to or greater than 1.1(date of procedure)]
- 15.7b **New!** Specify PRIMARY cause of death: Myocardial Infarct Bleeding Stroke Other
[If NOT Other, complete 17.1. Then 18.1 to 21.1a DO NOT need to be completed]
[If Other, 15.7c must be completed]
- 15.7c **New!** If answered *Other* to 15.7b, specify: _____

Section 16: Discharge data

- 16.1 Date patient was discharged by team under whose care surgery or angioplasty/stent was performed:
_____ [DD/MM/YYYY] [MUST be on or after date of procedure (1.1)]
- 16.2 Date patient was discharged from hospital: _____ [DD/MM/YYYY]
[MUST be on or after date of procedure (1.1)]
- 16.3 Discharge Destination: Home Care Home Other Hospital Other [If NOT 'Other' go to 16.4]
- 16.3a If answered *Other* to 16.3, specify: _____
- 16.4 What was the Rankin score at hospital discharge? [Tick 1 option only]
- 0 Asymptomatic
 - 1 Non-disabling symptoms no interference with lifestyle
 - 2 Minor disability some restriction in lifestyle but does not interfere with patient's capacity to look after self
 - 3 Moderate disability symptoms significantly interfere with lifestyle or prevent totally independent existence
 - 4 Moderately severe symptoms prevent independent existence but patient does not need attention 24hrs
 - 5 Severely disabled totally dependent day and night

Section 17: Phase 1 Data entry

- 17.1 **New!** Who completed Phase 1? [Tick 1 option only]
- Surgeon Specialist Registrar (Surgical) Basic surgical trainee Nurse
- Audit personnel Radiologist Specialist Registrar (Radiological) Other
- [If Other, 17.1a must be completed]
[If NOT Other, go to 18.1]
- 17.1a **New!** If answered *Other* to 17.1, specify: _____

Phase 2 [30-day survival/Follow-up assessment]

Section 18: Patient status at 30days after undergoing procedure

- 18.1 Did the patient die following discharge (up to 30 days after undergoing this procedure)? Yes No
[If No, go to 19.1]
- 18.1a If answered Yes to 18.1, give date patient died: _____ *[DD/MM/YYYY]*
[Date entered must be equal to or greater than 16.2 (date patient was discharged from hospital)]
- 18.1b Cause of death: Myocardial infarct Bleeding Stroke Other Unknown *[Tick 1 option only]*
[If NOT Other, go to 21.1]
- 18.1c If answered *Other* to 18.1b, specify: _____ *[Go to 21.1]*

Section 19: Follow-up attendance

- 19.1 Was the patient offered a post-discharge follow-up appointment? Yes No *[If No, go to 21.1]*
- 19.2 If answered Yes to 19.1, did the patient attend post-operative follow-up appointment? Yes No *[Tick 1 option only]*
[If No, go to 21.1]
- 19.2a If answered Yes to 19.2, give date of post-discharge follow-up assessment: _____ *[DD/MM/YYYY]*
[Date entered must be ON or AFTER date of procedure (1.1)]
- 19.2b **New!** Form of follow-up: *[Tick 1 option only]*
 Patient seen in OPD (own Trust) Patient seen in OPD (other Trust) Telephone follow-up Postal follow-up
- 19.3 Specify specialty of professional that assessed the patient: *[Select at least 1 option]*
 Surgeon Neurologist Stroke Physician Care of the Elderly Consultant
 Cardiologist/Cardiothoracic surgeon Other *[If NOT Other, go to 20.1]*
- 19.3a If answered *Other* to 19.3, specify specialty: *[e.g. Vascular SpR]* _____

Section 20: Post-operative follow-up data

- 20.1 **New!** Was the patient re-admitted for a complication <30days after operation and after hospital discharge?
 Yes No *[If No, go to 20.2]*
- 20.1a **New!** If answered Yes to 20.1, give date patient was re-admitted: _____ *[DD/MM/YYYY]*
[Date entered must be equal to or greater than 16.2 (date patient was discharged from hospital)]
- 20.1b **New!** Specify reason for re-admission: Stroke Cardiac Respiratory Other *[Select at least 1 option]*
[If 'No', go to 20.2]
- 20.1c **New!** If answered *Other* to 20.1b, specify: _____
- 20.2 Was evidence of cranial nerve injury found at follow-up (that was NOT identified prior to discharge)? Yes No
[If 'No', go to 20.3]
- 20.2a **New!** If answered Yes to 20.2, which nerve (or branch) was affected? *[Select at least 1 option]*
 Hypoglossal Facial Glossal pharyngeal Vagus Recurrent laryngeal
- 20.3 Has the patient had a stroke since discharge? Yes No *[If No, go to 20.4]*
- 20.3a If answered Yes to 20.3 give date patient experienced stroke (if exact date is not known, give best estimate):
[Date entered must be EQUAL to or GREATER than 16.2 (date patient was discharged from hospital)]
- 20.4 Rankin score at this visit (follow-up): *[Tick 1 option only]*
 0 Asymptomatic
 1 Non-disabling symptoms no interference with lifestyle
 2 Minor disability some restriction in lifestyle but does not interfere with patient's capacity to look after self
 3 Moderate disability symptoms significantly interfere with lifestyle or prevent totally independent existence
 4 Moderately severe symptoms prevent independent existence but patient does not need attention 24hrs
 5 Severely disabled totally dependent day and night
- 20.5 What drug therapy is the patient on post-operatively? *[Select at least 1 option]*
 Anti-platelet/thrombotic Statin Beta-blockers *[If NOT Anti-platelet/thrombotic, go to 21.1]*
- 20.5a If answered *Anti-platelet/thrombotic* to 20.5, specify drug(s): *[Select at least 1 option]* *[If NOT Other, go to 21.1]*
 Aspirin Clopidogrel Dipyridamole Warfarin **New!** Other
- 20.5b **New!** If answered *Other* to 20.5a, specify: _____

Section 21: Phase 2 Data entry

- 21.1 **New!** Who completed Phase 2? *[Tick 1 option only]*
 Surgeon Specialist Registrar (surgical) Basic surgical trainee Nurse
 Audit personnel Radiologist Specialist Registrar (radiological) Other
[If NOT Other, ignore 21.1a]
- 21.1a **New!** If answered *Other* to 21.1, please specify: _____

NOTES

*The table below is for your own notes ONLY i.e. the notes will not be analysed by the audit statistician.
On the web tool, limited space is provided at the end of each section for your note.*

Section 1	
Section 2	
Section 3	
Section 4	
Section 5	
Section 6	
Section 7	
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Section 12	
Section 13	
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Section 17	
Section 18	
Section 19	
Section 20	
Section 21	

APPENDIX 2 - HOSPITAL EPISODES STATISTICS (HES)

Data for each country is held by a different agency:

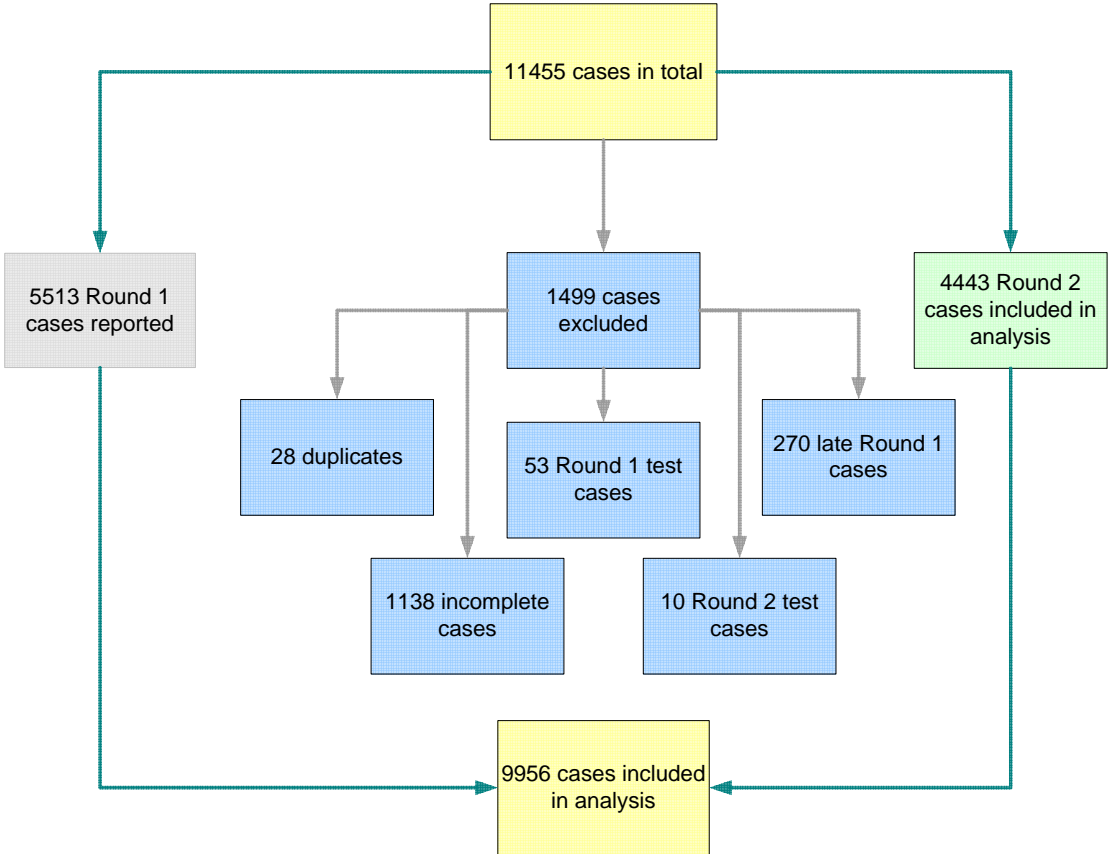
England - Hospital Episode Statistics, www.doh.gov.uk

Wales - Information Products Unit of Health Solutions, www.wales.nhs.uk

Scotland - Scottish Morbidity Records, www.isdscotland.org

Northern Ireland - Hospital Information Branch of the DHSSPSNI,
www.dhsspsni.gov.uk

APPENDIX 3 – CASE SELECTION FOR INCLUSION IN THIS REPORT



APPENDIX 5 - Stroke Care Networks

Networks encompass the whole stroke pathway by connecting different organisations and teams involved along the patients journey, so individuals experience co-ordinated management from the first contact which extends to lifelong support as a stroke survivor. Networks involve stroke survivors and carers as active partners in coordinating and supporting service development.

<http://www.improvement.nhs.uk/stroke/StrokeCareNetworks>

- | | |
|--|--|
| 1 Anglia Stroke and Cardiac Network | 17 North East London Cardiovascular and Stroke Network |
| 2 Avon, Gloucestershire, Wiltshire and Somerset Cardiac and Stroke Network | 18 North of England Cardiovascular Network |
| 3 Bedfordshire and Hertfordshire Heart and Stroke Network | 19 North Trent Cardiac Network |
| 4 Birmingham, Sandwell and Solihull Cardiac and Stroke Network | 20 North West London Cardiac and Stroke Network |
| 5 Black Country Cardiovascular Network | 21 Peninsula Heart and Stroke Network |
| 6 Cardiac and Stroke Networks in Cumbria and Lancashire | 22 Shropshire and Staffordshire Heart and Stroke Network |
| 7 Cheshire and Merseyside Cardiac Network working with the stroke community | 23 South Central Vascular Networks |
| 8 Coventry and Warwickshire Cardiovascular Network | 24 South East London Cardiac and Stroke Network |
| 9 Dorset Stroke Network | 25 South West London Cardiac and Stroke Network |
| 10 East Midlands Cardiac and Stroke Network | 26 Surrey Heart and Stroke Network |
| 11 Essex Cardiac and Stroke Network | 27 Sussex Heart Network |
| 12 Greater Manchester and Cheshire Cardiac and Stroke Network | 28 West Yorkshire Cardiovascular Network |
| 13 Herefordshire and Worcestershire Cardiac and Stroke Network | |
| 14 Kent Cardiovascular Network | |
| 15 North and East Yorkshire and Northern Lincolnshire Cardiac and Stroke Network | |
| 16 North Central London Cardiac and Stroke Network | |

