London Ambulance Service NHS Trust

Stroke Annual Report: 2011/2012

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Foreword

“The management of patients who suffered a stroke, or ‘brain attack’, has historically been very poor. The expectation was that this was a group of patients, mostly elderly, with a condition for which the outcome was often poor and for which little effective management was available.

In contrast, the London Ambulance Service NHS Trust (LAS) has, over the past decade, led the way in improving survival for patients who have suffered a ‘heart attack’ or out of hospital cardiac arrest. The standards we have set in this area have driven up the expectations of not only patients, the public but other ambulance services both nationally and internationally.

It is therefore with great pride that we publish the first annual report into the care given to our stroke patients. This report, as highlighted by Professor Rudd’s comments below, demonstrates that as in cardiac care, the LAS has been instrumental in working in partnership to deliver a service which has dramatically influenced the standard of care available to the many patients across London who have suffered a stroke.

We have demonstrated that the LAS is able to accurately identify patients who have suffered a stroke, prioritise those for whom clot busting treatment is an option, and ensure the most appropriate triage decision is made for all these patients. We have worked closely with the Stroke Networks and with individual hospitals to improve the response to this group of patients. This report not only identifies those areas where we have made great progress but also identifies where we can improve our response, to ensure an even faster referral, accepting the especially challenging nature of some of these calls.”

Fionna Moore, BSc, FRCS, FRCSEd, FCEM, FIMC RCSEd, Medical Director and Consultant in Emergency Medicine, LAS NHS Trust.

“The reconfiguration of stroke care in London two years ago has been one of the most successful changes that the NHS has seen in recent years. Previously, despite clear evidence for prompt delivery of acute stroke care and repeated national audit reports indicating failings in the service, there was still the situation that large segments of the London population only had access to second rate stroke care at best. Stroke is a medical emergency: the quicker patients get to a centre capable of providing the appropriate care the more likely it is that the patient will survive and go home having made a full recovery. The LAS has been a key partner in delivering a stroke service that is now recognised as being one of the best in the world. We have shown that we are saving more lives and reducing the financial burden to society as a consequence of the changes. From the beginning LAS staff have been enthusiastic supporters of the reorganisation, frequently being the group that have pushed for even more stringent standards than the others developing the service. They have delivered everything they promised, as this report shows, contrary to the expressed views of many prophets of doom both from within the health professions and the general public.

However, we must not be complacent. With the current financial difficulties and a huge restructuring of the health service there are many uncertainties for the future. Hopefully common sense and a belief in evidence based medicine will mean that the changes that we have all worked for will continue, and indeed be made even better. “

Professor Anthony G Rudd, MA MB BChir FRCP(London), London Stroke Clinical Director

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Introduction

Stroke is a 'brain attack' caused by a disruption to the blood supply in the brain. It is the second biggest killer and the most common cause of severe disability affecting people in London [1]. In 2007, NHS London published *Healthcare for London*: *A Framework for Action*, which highlighted significant variations in the quality of stroke care across the capital and presented ambitious plans to reform stroke services in London [2]. These reforms proposed the introduction of a network of specialist acute stroke centres to allow early assessment using a Computerised Tomography (CT) scan of the brain and to provide urgent specialist treatment. These centres would further be supported by stroke units and community services dedicated to the long term rehabilitation of stroke patients. Following comprehensive consultations, *A Stroke Strategy for London* was published in 2009 outlining a number of goals, including that Londoners should be no more than a 30 minute ambulance journey away from acute stroke facilities with rapid access to high quality specialist treatment available 24 hours a day, seven days a week [1].

The London Ambulance Service NHS Trust (LAS) played a vital role in the implementation of the new stroke network. In February 2010, a transitional London-wide pathway was introduced, whereby ambulance staff transported patients to one of eight dedicated Hyper-Acute Stroke Units (HASUs). Patients were eligible for the pathway if LAS staff diagnosed a possible stroke following an assessment using the Face, Arm and Speech Test (FAST) and if their symptoms were less than three hours old. In July 2010, the LAS successfully implemented the second phase of the pathway so that all new stroke patients are now transported directly to a HASU.

To ensure that patients attended by the LAS receive world-class emergency medical assistance and prompt access to a specialist facility, the Clinical Audit and Research Unit (CARU) established a stroke registry to enable the LAS to report on patient care. Stroke Care Packs detailing LAS-wide and Ambulance Complex-level performance are distributed across the Service each month in order to monitor the quality of care provided and identify areas for improvement. CARU is pleased to present this document - its first annual stroke report - which allows more thorough examination of the care provided to our stroke patients.

From 1st April 2011 to 31st March 2012, 8,680 patients presented to LAS staff with symptoms of a stroke as identified by assessment using the FAST[1]. This report details the demographics of these patients, and our clinical and operational performance. Data were sourced from Patient Report Forms (PRFs), Emergency Operations Centre (EOC) call logs, Clinical Coordination Desk (CCD) records and vehicle Mobile Data Terminals (MDT). Detailed journey time information can be found in the Appendices.

[1] For ease of reporting, patients recognised as presenting with a possible stroke following a positive assessment on the FAST are referred to as stroke patients in this report. However, one should note that a conclusive stroke diagnosis can only be confirmed or rejected following a CT scan at hospital.

1. Profile of patients

1.1. Age and gender

The average age of the 8,680 stroke patients attended by the LAS was 72 years. The majority of patients were female (52.3%, n=4,543), and they were on average 4 years older than male patients (74 years vs. 70 years respectively). The distribution of age groups by gender is shown in Figure 1 below.

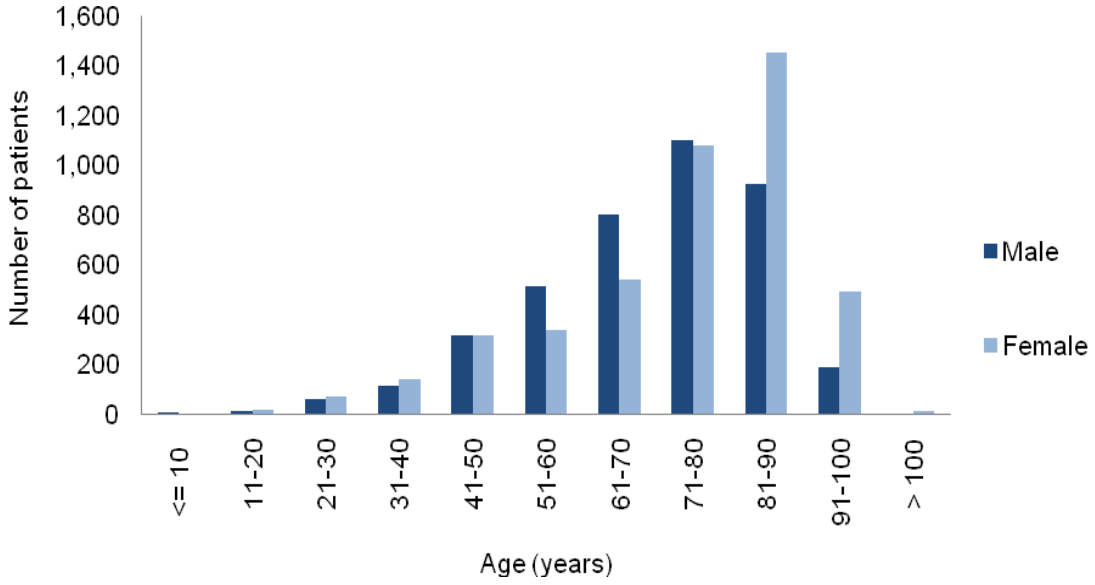


Figure 1: Age by gender

1.2. Ethnicity

The majority of patients who provided ethnicity information to attending crews reported that they were of a 'White' ethnic origin (66.1%, n=5,741). 11% (n=954) of patients were either unable or unwilling to state their ethnicity.

As can be seen in Table 1 below, 'White' patients suffered their stroke an average of 7 years later than patients who described themselves as 'Asian / British Asian', and 8 years later than 'Black / British Black' patients.

Ethnicity	N	%	Age (mean)
White	5,741	66.1%	74
Asian / British Asian	573	6.6%	67
Black / British Black	639	7.4%	66
Mixed	46	0.5%	65
Other	247	2.9%	66
Refused / unable	954	11.0%	69
Not documented	480	5.5%	68

Table 1: Average age by ethnicity

1.3. Prevalence

There was little variation in the prevalence of stroke by month and day of the week. However, a greater number of strokes occurred in the month of October (8.8%, n=768) and the most common day of the week was Friday (15.1%, n=1,312). Stroke patients were most frequently attended in the morning, with 28.6% (n=2,482) of patients requiring assistance between 8am and 12pm.

2. Call categorisation

The LAS triages all 999 calls for help using the Medical Priority Dispatch System which guides callers through a set of questions designed to establish the nature and severity of the patient's condition. To ensure that potential stroke patients are identified as early as possible, Emergency Medical Dispatchers also undertake a telephone evaluation using the FAST.

Based on the information provided by the caller, the call is assigned a chief complaint which leads to the allocation of one of two response categories. The highest priority response category (Category A) is allocated to 999 calls where the patient's condition is believed to be immediately life threatening. Calls where there is good evidence of a new onset of stroke symptoms fall into this category; 61.3% (n=5,317) of stroke

patients were allocated a Category A response. The remaining 38.7% (n=3,363) of patients were assigned lower priority Category C responses, as the information available to the call taker suggested immediate intervention was not required.

Table 2 below shows that just over half (54.4%; n=4,718) of patients, who were identified as having a stroke by the attending ambulance staff, were also allocated a chief complaint of stroke at the point of the 999 call.

Chief complaint	N	%
Stroke	4,718	54.4%
Health Care Professional (HCP) Admission[2]	855	9.9%
Unconscious / Fainting	700	8.1%
Falls	612	7.1%
Sick Person	609	7.0%
Convulsions / Fitting	261	3.0%
Breathing Problems	228	2.6%
Chest Pain	195	2.2%
Headache	68	0.8%
Diabetic Problems	67	0.8%
Other	367	4.1%

Table 2: Chief complaint allocated during the 999 call

[2] HCPs will call the LAS when a patient is to be admitted to hospital and their condition necessitates ambulance conveyance. Section 8 provides further information for patients where a HCP requested LAS attendance (n=855).

3. Response times[3]

The Department of Health (DH) set a target for UK ambulance services to respond to all Category A patients within 8 minutes of the 999 call. For stroke patients who were categorised as requiring a Category A response, the median time from the 999 call to the LAS arrival on scene was 7 minutes. In cases where LAS staff attended calls that were assigned a lower category response, the median response time was 11 minutes. Overall, the median response time for all stroke patients was 8 minutes.

Category	N *	Average (minutes)		Range ^ (minutes)
		Median	Mean	
All patients	7,825	8	11	0-188
Category A calls	4,835	7	8	0-35
Category C calls	2,990	11	16	0-188

* Health Care Professional admissions (n=855) are excluded from this table as they can request a response within a specific timeframe (see section 8 for more information).

^ Extended ranges can be explained by a number of reasons, including availability of resources and instances where calls were initially given a lower priority before being upgraded by a clinician following further assessment of the patient's condition.

Table 3: Response times

4. Patient care

4.1. Face, Arm and Speech Test (FAST)

All patients who are suspected to have suffered a stroke must be assessed using the FAST by the attending ambulance staff. In order for the FAST to be deemed as complete all elements (facial and arm weaknesses, and speech disturbances) must be considered. If the patient's condition or other circumstances make it impossible to assess one or more elements, staff are asked to clearly document the reasons why they were unable to fully assess the patient.

96.5% (n=8,380) of patients received a full FAST or valid reasons for non-completion of elements were provided.

Of interest, facial weakness was the most routinely omitted element of the FAST (n=136), followed by arm weakness (n=121) and slurred speech (n=119).

[3] This section employs median values. However, means and ranges are also provided in the table for comparison purposes. Reasons for specific extended time ranges can be found in monthly Stroke Care Packs.

4.2. Onset of symptoms[4]

It is important to establish the time of onset of a stroke as accurately as possible, especially if treatment with thrombolysis (clot-busting drug) is being considered, as there is a shift in the balance between benefit and risk with time. The time of onset of stroke symptoms was recorded for 82.7% (n=7,176) of patients. For a further 12.7% (n=1,100) of patients, it was not possible to determine the time of onset of symptoms (e.g. when patients awoke with stroke symptoms).

4.3. Blood Pressure measurement

The patient's blood pressure should be measured as it may be elevated during or following a stroke and could require immediate management on arrival at hospital. Equally, many patients will have suffered from elevated blood pressure as the underlying cause of the stroke. 99.4% (n=8,630) of patients had their blood pressure assessed. Valid reasons why blood pressure could not be measured were provided for a further 0.5% (n=40) of patients. Of these 40 patients, equipment issues prevented blood pressure being monitored for 27 patients, 12 patients refused to have their blood pressure measured and in one case blood pressure was not assessed due to the patient presenting with time critical features. Overall, 99.9% (n=8,670) of patients had their blood pressure measured or a valid reason provided where it was not assessed.

4.4. Blood Glucose measurement

Blood glucose should be assessed in patients where a stroke is suspected as hypoglycaemia may also present with neurological signs that mimic stroke. 97.1% (n=8,426) of patients had their blood glucose measured. In 2.2% (n=190) of cases staff documented that they were unable to measure blood glucose due to issues with equipment, which was either missing or not functioning properly. In addition, 0.1% (n=11) of patients refused to have their blood glucose assessed. In total, 99.4% (n=8,627) of stroke patients had their blood glucose assessed or a valid exception documented.

[4] Due to rounding, percentages will not equal 100%.

5. On-scene times[5]

The LAS encourages staff to spend no longer than 30 minutes on-scene to ensure that stroke patients reach hospital at the earliest opportunity. The median time spent on-scene for all stroke patients was 31 minutes (see Table 4 below). Overall, just under half of crews (46.4%, n=4,024) spent less than 30 minutes on-scene attending patients.

A single responder (either in an LAS fast response car, motorcycle or cycle) may be dispatched alongside an ambulance, especially if located closer to the patient than the nearest available ambulance or in locations where an ambulance vehicle is likely to be delayed due to difficult traffic conditions. When patients were attended by a single responder as well as an ambulance crew, longer on-scene times were incurred than when patients were attended by an ambulance crew alone (medians of 33 and 30 minutes respectively). In 47.1% (n=4,092) of cases the ambulance crew arrived later than the single responder, and the average time the single responder awaited an ambulance in these instances was 6 minutes.

Patients	N *	Average (minutes)		Range ^ (minutes)	% within 30 minutes
		Median	Mean		
All stroke patients	8,679	31	34	5-210	46.4% (n=4,030)
Only ambulance on-scene	3,880	30	32	5-210	53.4% (n=2,071)
Both single responder and ambulance crew on-scene	4,799	33	35	9-172	40.8% (n=1,959)

* One patient is excluded due to missing time information on the PRF and the EOC call log.

^ Extended ranges can be explained by a number of reasons, including delays gaining access to the location, difficulties moving patients, and time spent persuading patient's to travel to hospital.

Table 4: On-scene times

6. Conveyance

6.1. Patient destination

All patients with a new onset of stroke symptoms as identified using the FAST are taken directly to a HASU. Conveyance to an Emergency Department (ED) may be appropriate if the patient's condition is such that a journey to a HASU may be unsafe (for example, if the patient's airway is not manageable, if the patient is agitated or deeply unconscious or is having recurring seizures). Patients should also be

[5] This section employs median values. However, means and ranges are also provided in the table for comparison purposes. Reasons for specific extended time ranges can be found in monthly Stroke Care Packs.

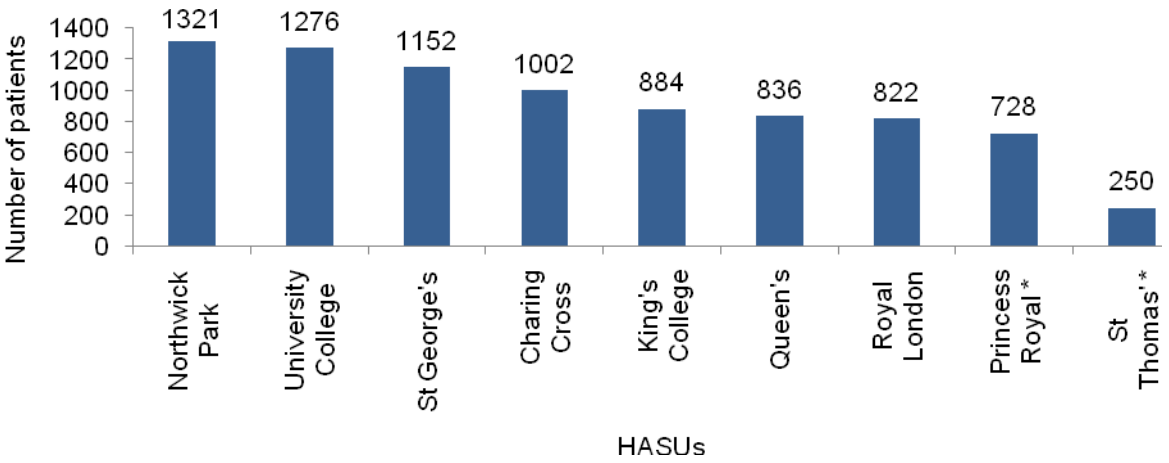
transported to the nearest ED in instances where stroke symptoms resolve on-scene leaving no residual impact (possibly indicating a transient ischaemic attack).[6]

Of the 8680 patients, 32 were not conveyed by the LAS. 31 patients refused conveyance to either a HASU or ED against the advice of attending ambulance staff, and one patient was assisted by a LAS single responder but handed-over to a different ambulance service provider for conveyance to hospital.

The vast majority of patients (98.7%; n=8,533) were transported to an appropriate facility, with 95.7% (n=8,271) taken directly to a HASU and 3.0% (n=262) appropriately to the nearest ED.[7,8] 1.3% (n=115) of patients were conveyed to an ED, but in fact required transport to a HASU.

6.2. HASU utilisation

Northwick Park Hospital HASU received the highest number of our patients (16.0%, n=1,321), followed by University College Hospital (15.4%; n=1,276) (see Figure 2 below).



* The HASU at St. Thomas' Hospital acted as a temporary facility whilst the HASU at Princess Royal University Hospital was being established (opened on 26th October 2011)

Figure 2: HASU utilisation

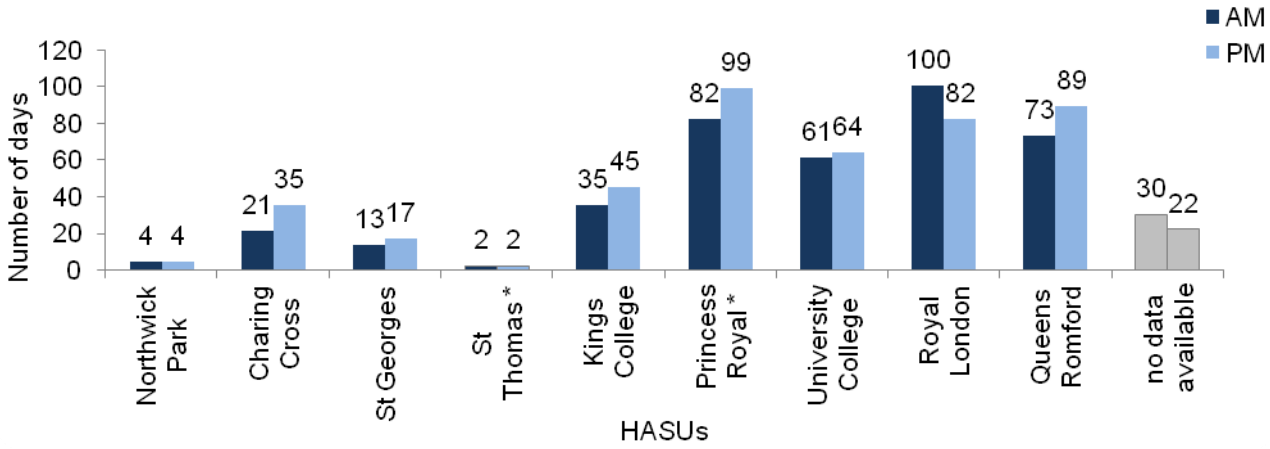
Since the launch of the stroke network in London, the LAS's Clinical Coordination Desk (CCD) has monitored the HASU bed capacity with the aim of balancing the patient flow to each unit. If there is no or low bed availability at the nearest HASU, CCD may advise conveyance to a nearby unit if safe to do so. However, it should be

[6] A transient ischaemic attack is caused by a temporary fall in the blood supply to the brain. Unlike a stroke, a transient ischaemic attack resolves within 24 hrs.

[7] Further details regarding the patients conveyed to ED appropriately can be found in Appendix 1.

[8] Due to rounding, percentages will not equal 100%.

noted that as tertiary specialist facilities HASUs will continue to accept patients regardless of reported bed availability. As can be seen in Figure 3 below, there is a great deal of variation in bed availability. It is interesting to note that the most utilised HASU - Northwick Park (see Figure 2) - reported the most bed availability with just four mornings and four afternoons where no beds were available.



Source: LAS Emergency Bed Service

* The HASU at St. Thomas' Hospital acted as a temporary facility whilst the HASU at Princess Royal University Hospital was being established (which opened on 26th October 2011)

Figure 3: The number of mornings and afternoons HASUS declared zero bed availability between July 2011 and March 2012

6.3. Pre-alert (blue-light) calls

Patients with stroke symptoms that are less than four and a half hours old may be potentially eligible to receive thrombolysis at the HASU. These patients therefore require rapid conveyance to a HASU using blue lights with a pre-alert call to ensure that the stroke team are ready to immediately assess the patient. Patients whose stroke symptoms are older than four and a half hours are transported to a HASU under normal driving conditions.

5,284 patients transported to a HASU had onset of symptoms within the four and a half hour window and were therefore eligible for a pre-alert (blue-light) journey. 95.5% (n=5,045) of these patients were correctly conveyed with a pre-alert call, however 4.5% (n=239) were transported to a HASU under normal driving conditions. A further 1,027 patients conveyed to a HASU received a pre-alert call, although their onset of symptoms was outside the four and half hour window, or the time of onset of symptoms was either unknown or not documented. Crews have the discretion to place a pre-alert if they have concerns regarding patient's condition or feel that there is a potential for deterioration.

7. Journey times[9]

The London stroke network has been designed so that patients should spend no longer than 30 minutes travelling by ambulance directly to a HASU using a blue light transfer with a pre-alert call. The median journey time for patients conveyed to a HASU with a pre-alert call was 13 minutes. Overall, the median journey time from scene to hospital was 14 minutes.

Patients	N*	Average (minutes)		Range (minutes)
		Median	Mean	
All stroke patients conveyed	8,647	14	16	1-130
Patients conveyed to a HASU with a pre-alert call	6,311	13	15	1-80
Patients eligible for a blue light journey but conveyed to a HASU under normal driving conditions	239	18	20	3-73
Patients conveyed to a HASU under normal driving conditions	1,720	21	23	1-130
Patients conveyed to an ED	377	12	14	2-55

* 33 patients are not included in this table: 31 patients refused conveyance, 1 patient was conveyed by another ambulance service and therefore times are not available and 1 case was missing time information on the PRF and the EOC call log.

^ Extended ranges are due to various factors, including instances where symptoms evolved during the journey to ED and crews were redirected to HASUs, traffic conditions and vehicle failures.

Table 5: Journey times

[9] This section employs median values. However, means and ranges are also provided in the table for comparison purposes. Reasons for specific extended time ranges can be found in monthly Stroke Care Packs.

8. National Clinical Quality Indicators (CQIs)

In April 2011, the DH started to monitor the performance of English Ambulance Services in delivering stroke care as part of a series of Clinical Quality Indicators (CQIs).

8.1. Call to HASU

The first CQI examines the proportion of stroke patients potentially eligible for thrombolysis who arrive at a HASU within 60 minutes of the 999 call. 'Potentially eligible for thrombolysis' is defined as those patients whose stroke symptoms are less than four and a half hours old when leaving the scene of incident, or where the time of onset of symptoms was not documented on the PRF. Please note that HCP referrals are excluded from this indicator as health professionals request a response within a specific timeframe (see section 8 for more information).

From April 2011 to March 2012, 5,337 stroke patients were deemed potentially eligible for thrombolysis and were conveyed directly to a HASU. Of these, 64.5% (n=3,444) arrived at a HASU within 60 minutes of the time the 999 call was made.

8.2. Pre hospital care bundle

The second CQI for stroke care is the percentage of patients who receive all the essential elements of pre hospital care for their condition or valid exceptions to its provision (e.g. patients refused an element of care).[10] The pre hospital stroke care bundle includes FAST assessment, blood pressure and blood glucose measurement.

In total, 93.5% (n=8,117) of patients were provided with a full care bundle or a valid exception to an element of care was provided.

9. Patients referred by Health Care Professionals[11]

LAS staff attended 855 stroke patients referred by Health Care Professionals (HCPs), most commonly a GP, who had assessed the patient in person or via the phone. 999 calls made by HCPs requesting assistance for their patients, are triaged differently from those made by the general public. HCPs provide a suspected diagnosis and request one of the following responses: immediately life threatening (equivalent to Category A – within 8 minutes), not immediately life threatening but requiring lights and sirens (30 minutes), or within one, two, three and four hours.

[10] Equipment issues are not a valid exception under the DH CQI criteria.

[11] This section employs median values. However, mean and range are also provided in the table for comparison purposes. Reasons for specific extended time ranges can be found in the monthly Stroke Care Packs.

Based on the response time specified by the caller, 56.4% (n=482) of patients referred by HCPs received a Category A response, while 43.6% (n=373) were allocated a Category C response. The median response time for all patients referred by HCPs was 10 minutes. Patients allocated a Category A response had a median 999 call to scene time of 7 minutes which was within the DH target of 8 minutes. The median response time for patients allocated a Category C response was 24 minutes. Whilst this may be well within the time requested by the HCP, it is considerably longer than the 11 minute response time received by patients who were handled through the standard 999 system (see section 3).

Category	N	Average (minutes)		Range (minutes)
		Median	Mean	
All Health Care Professional admissions	855	10	20	0-355
Category A calls	482	7	8	0-38
Category C calls	373	24	35	2-355

Table 6: Response times for Health Care Professional admissions

Three patients referred by HCPs refused transport to hospital against the advice of LAS staff. Of 852 patients who were conveyed, 89.6% (n=763) were transported to a HASU. The remaining 10.4% (n=89) of patients were conveyed to an ED. Of interest, 87.6% (n=78) of these patients were conveyed to an ED because the LAS staff were instructed to do so by the HCPs who had arranged the transport.

10. Discussion

Over the last two years, acute stroke care in the capital has undergone an outstanding transformation with patients now receiving direct access to Hyper-Acute Stroke Units (HASUs) dedicated to the rapid assessment and treatment of an acute stroke. This report highlights the key achievements of the LAS in ensuring that patients receive world-class care as part of the stroke network arrangements in London. The findings demonstrate that LAS staff are highly compliant with the acute stroke pathway, with 98.7% of stroke patients conveyed directly to the most appropriate unit. During the period covered in this report, patients received a prompt response from the LAS following the 999 call and journey times to HASUs have been consistently well within the targets set by London stroke networks. This is an outstanding achievement, as the speed in which stroke patients reach specialist care has a huge impact on their chances of survival and the prospect of making a full recovery after the event.

Despite these impressive accomplishments, there are still areas where additional improvements could be made. In particular, further efforts aimed at reducing time spent on-scene would benefit acute stroke patients by enabling them to arrive at a HASU even more promptly. We have already taken measures to achieve this: as of September 2011 staff are no longer required to undertake an electrocardiogram (ECG) when attending acute stroke patients, unless there is a specific indication. In addition, staff are encouraged to reduce the time spent on-scene by taking secondary observations in the vehicle en-route to a HASU. Nevertheless, it is worth noting that there are many factors that influence on-scene times, including mobility problems and difficulties gaining co-operation when the patient is experiencing the debilitating effects of an acute stroke. Time spent on-scene and the overall duration between the 999 call and arrival at the HASU are being monitored by the LAS on a monthly basis to ensure that more patients can arrive at a specialist unit in the shortest possible timeframe.

The delivery of care to patients is of a high standard with 93.5% of patients receiving the stroke care bundle, although the LAS recognises that there is room for improvement. To ensure that stroke patients receive optimal care, the LAS has participated in the Ambulance Service Cardiovascular Quality Improvement (ASCQI) project: a national initiative aimed at improving pre hospital care by ensuring that every patient presenting with stroke receives each element of the care bundle. The project was initially launched at Pinner ambulance station where staff have identified a need to enhance clinical education. As such, Pinner staff invited Stroke Consultants from local HASUs to provide training days on the neurological examination of stroke patients, and an informational DVD was produced interviewing a stroke patient about their experience. In addition, a multimedia training package following patients' journey from the 999 call through to rehabilitation is in development. The ASCQI project has now been rolled out throughout the organisation and future improvements are expected to the delivery of the stroke care bundle across the LAS.

One of the issues identified in this report is a difficulty in assessing blood glucose levels in a small number of patients due to missing equipment. In an effort to address the problem, the LAS has began issuing new vehicle-based equipment packs designed to reduce the number of incidents where blood glucose monitors are not available.

There are a number of areas that we will continue to develop in collaboration with the Stroke Network, which are responsible for managing the stroke services across London, to ensure that patients are conveyed to the most appropriate facility for their needs. Further work is required in improving HASU bed availability to maximise efficiency across the network, in order to ensure that patients can be transported to the nearest HASU without unnecessary delay.

In addition, we need to ensure that our staff and GPs, who refer their patients to the LAS, work together to ensure that patients are taken to the most appropriate hospitals for their condition. Whilst in some instances it may be appropriate for the GP/other HCP (based on their knowledge of the patient's medical history) to instruct LAS staff to convey a patient with acute stroke symptoms to a local ED, crews need to be aware that they can challenge this decision if they believe that a HASU would be more appropriate.

Further developments to stroke pathways in London and future training of LAS staff will to a large extent be dependent on having access to outcome data for individual patients, including confirmed diagnoses and treatment information. In the future, the LAS aims to link pre hospital data with patient outcome information provided by hospitals through working with the London Stroke Networks and though contributing to the Sentinel Stroke National Audit Programme (SSNAP). This will enable the LAS to feedback to staff on the impact of care that they delivered, inform future developments in pre hospital care and provide an even more comprehensive overview of the performance of stroke services across London.

11. Points for action

In order to continue providing excellent clinical care to our patients, it is important for crews to:

- Aim to spend less than 30 minutes on-scene with stroke patients where possible, so that patients can reach appropriate treatment at the earliest opportunity.
- Ensure that all patients who have a new onset of stroke are conveyed to a HASU, if safe to do so.
- Ensure that a pre-alert call to the receiving HASU is placed when conveying patients whose onset of symptoms is within the 4.5 hour window.
- Always provide an appropriate stroke care bundle, including a full FAST assessment.
- Ensure the availability of a fully functioning kit, including blood pressure sphygmomanometer and blood glucose monitor.
- Always document the time of onset of symptoms. If unable to do so, staff should document the reasons accordingly.

It is also important that staff facilitate data collection and reporting by:

- Using illness code 103 for all patients who are assessed as FAST positive.
- Correctly documenting the hospital and HASU suffix code to allow accurate identification of patient destination.
- Clearly documenting all observations and any reasons why an element of care may not have taken place.

The LAS is committed to further increasing the efficiency of the London stroke pathway and will:

- Continue to support the stroke networks in optimising HASU bed capacity across London so that patients can be conveyed to the most appropriate specialist centre.
- Work with GPs to ensure that patients are referred to the most appropriate hospital for their condition.
- Collect patient outcomes to enable feedback to staff and inform future developments in pre hospital care of stroke patients.

References

1. Healthcare for London. *Stroke Strategy for London* (2009). Available from: http://www.londonhp.nhs.uk/wp-content/uploads/2011/03/London-Stroke-Strategy.pdf
2. NHS London. *Healthcare for London: A Framework for Action* (2007). Available from: http://www.londonhp.nhs.uk/wp-content/uploads/2011/03/A-Framework-for-Action.pdf

Appendix 1: Reasons for appropriate conveyance to an ED

Valid reasons for conveyance to an ED	N	%
GP's instructions	82	31.3%
Symptoms resolved on-scene	60	22.9%
Level of consciousness	37	14.1%
Pre-existing weakness	21	8.0%
Patients refused HASU	15	5.7%
Advised by CCD	13	5.0%
Airway unmanageable	11	4.2%
Paediatric patients	7	2.7%
Abnormal vital signs	5	1.9%
Seizures unmanageable	3	1.1%
Other	8	3.1%

Appendix 2: Pre-alert journey times per HASU

HASU	N	Median (minutes)	Mean (minutes)
St Thomas' Hospital *	202	9	12
Queens Hospital	638	11	12
Northwick Park Hospital	1021	13	14
Royal London Hospital	631	13	15
Kings' College Hospital	710	13	14
Charing Cross Hospital	723	14	14
University College Hospital	978	14	16
St Georges' Hospital	870	14	14
Princess Royal Hospital *	538	15	16

* The HASU at St. Thomas' Hospital acted as a temporary facility whilst the HASU at Princess Royal University Hospital was being established (opened on 26th October 2011)

Appendix 3: Journey times per Primary Care Trust

Primary Care Trust	N*	Median (minutes)	Mean (minutes)
Barking & Dagenham	144	9	11
Barnet	273	18	20
Bexley	161	23	24
Brent	235	11	11
Bromley	263	12	14
Camden	141	9	10
City & Hackney	125	12	13
Croydon	248	17	18
Ealing	213	14	15
Enfield	185	27	28
Greenwich	143	20	21
Hammersmith & Fulham	89	8	9
Haringey	151	18	20
Harrow	180	9	10
Havering	202	8	9
Hillingdon	220	18	18
Hounslow	163	17	18
Islington	111	10	11
Kensington & Chelsea	97	10	11
Kingston	102	16	17
Lambeth	170	8	9
Lewisham	164	14	15
Merton & Sutton	264	13	13
Newham	118	13	14
Redbridge	186	15	16
Richmond & Twickenham	130	19	20
Southwark	182	8	9
Tower Hamlets	140	7	8
Waltham Forest	163	20	22
Wandsworth	152	10	10
Westminster	206	8	10
Other	16	20	18
LAS wide	**5337**	**13**	**15**

* This table refers to stroke patients within the CQI criteria (i.e. patients who were deemed potentially eligible for thrombolysis and were conveyed directly to a HASU). See section 7 for further definitions.