



London Ambulance Service **NHS**  
NHS Trust

**A re-audit of the management of sickle cell crisis and patients' experience of  
the care provided by the London Ambulance Service**

December 2016

**Clinical Audit & Research Unit**

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## Executive Summary

### Background

Sickle cell is a prevalent condition within London, with the London Ambulance Service NHS Trust (LAS) attending over 4,000 patients in sickle cell crisis last year. The Clinical Audit and Research Unit (CARU) audited the care provided to patients in sickle cell crisis in 2004 and again in 2011, and showed that improvements to care were made. However, feedback from the LAS Patients' Forum and the Sickle Cell Society suggest that there is still room for improvement. This clinical audit aimed to re-assess the care provided to patients in sickle cell crisis to determine whether further improvement is required. We also aimed to understand patients' experiences through a postal questionnaire.

### Methodology

Patients were included if they were attended by the LAS in April 2016 for sickle cell crisis (n=358). Patient Report Forms (PRFs) were reviewed for compliance to LAS protocols and the UK Ambulance Services Clinical Practice Guidelines, with 137 PRFs clinically reviewed by a Senior Clinical Advisor.

Two-hundred and twenty-four patients were sent a letter, information sheet and patient questionnaire (consisting of nine tick-box questions and a free-text box). For patients under 18 years of age, questionnaires were sent to their next of kin. Seventy-three questionnaires were returned, a response rate of 33%.

### Results

*Since the original clinical audits, a number of improvements have been made:*

- 90% of patients (n=361) had their pain assessed twice, a 28% increase from the 2011 re-audit and a 49% increase from the original 2004 audit<sup>i</sup>.
- Nearly all patients (99%, n=353) had their oxygen saturation measured, an increase of 7% from the 2004 findings.
- All eligible patients whose oxygen saturations were below 94% received supplemental oxygen (100%, n=9); an increase of 27% and 25% from the 2011 and 2004 audits respectively.
- 64% of eligible patients (n=142) were administered morphine, a 16% and 57% increase from the 2011 and 2004 clinical audits. A number of patients had taken opiate analgesia prior to LAS arrival, some of which reached the maximum dose of 20mg. Questionnaire responses indicated that pain relief

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<sup>i</sup>All percentage changes are percentage point increases or decreases

helped to some extent for the majority of patients; however, one patient expressed confusion over which analgesia crews could administer in a crisis.

- Over three-quarters of patients with chest pain had an ECG carried out (82%, n=113), a 53% increase from the previous clinical audit.
- Over half of patients (60%, n=205) were assisted to the ambulance, which was a 7% increase from 2011.
- 98% of patients (n=275) were triaged to their usual treatment centre where an agreed protocol is in place; an 11% increase from the previous clinical audit and a 17% increase from the original audit. However, over a quarter of patients (27%, n=95) did not have their usual treatment centre documented on the call log.

*A decrease was also found:*

- 92% of eligible patients (n=308) were administered Entonox, a 3% decrease from 2011.

*The following aspects of care were not measured in the previous reports:*

- When the call handler was made aware that the patient was in crisis, 91% (n=243) were assigned the correct MPDS determinant (26C3). 76% of patients (n=261) received a response within the commissioned surge target response time of either 45 minutes (Surge Red) or 1 hour (Surge Purple). The median response time was 14 minutes, ranging from 2 minutes to 3 hours and 11 minutes. A number of patients commented that response times were longer than expected in their questionnaires. On one occasion, an ambulance was dispatched but the patient did not cancel the ambulance before they made their own way to hospital.
- Most clinicians administered morphine via the appropriate route (90%, n=134) and all administered an appropriate dose (100%, n=148). Documentation of drug wastage and drug pack codes is in need of improvement (48%, n=60/126; and 56%, n=13/23 respectively).
- Nearly all clinicians followed the patient's treatment plan (94%, n=45/48). However, the remaining 308 patients did not have a treatment plan documented.

## **Summary**

The care delivered to patients in sickle cell crisis has improved dramatically in recent years and is of a high standard. Areas for improvement were noted and with the exception of opiate administration, these were mostly around internal procedures (i.e. documenting drug wastage). Patients experiencing sickle cell crisis can help LAS clinicians to provide an even higher standard of care by ensuring that call takers are fully aware of their symptoms and have a treatment plan available.

## Recommendations

1. The Sickle Cell Society should liaise with Sickle Cell Centres in London to ensure all patients have a copy of their treatment plan, where appropriate.
2. The LAS will seek advice from sickle cell specialists in order to provide guidance for crews on pharmacology, specifically: the maximum initial and total doses of morphine in the pre-hospital setting and interactions with previous medication taken by the patient.
3. An article will be written for the Sickle Cell Society newsletter and website to inform patients with sickle cell of: the importance of informing call handlers when they are in crisis; cancelling an ambulance when not required; expected response times, and ambulance clinicians' treatment capabilities.
4. The clinical audit findings, including patient questionnaire quotes, will be shared with the tutors delivering the sickle cell face-to-face CSR training module.
5. A Clinical Update article will be produced to inform frontline staff of the key findings of this clinical audit, including the importance of: obtaining two pain assessments; appropriate pain management, and documenting the patient's treatment plan.
6. Feedback will be provided to call handlers who triaged calls incorrectly.
7. An infographic will be sent to stations and shared on the Service's Listening in Action Facebook page to present the key audit findings and facilitate discussion amongst clinicians.
8. Identified areas for improvement in medicines management will be shared with the Medicines Management Group.
9. This report will be shared with the LAS Patients' Forum and Sickle Cell Society.
10. An article will be produced for the EOC Quality Assurance Bulletin to remind call handlers of the correct sickle cell triage and documentation of treatment centres.
11. The CARU induction talk delivered to EOC staff will be updated to ensure new staff are aware of the correct triage for patients in sickle cell crisis.
12. A further re-audit will be undertaken to assess whether the above actions, once implemented, have led to increased administration of opiate analgesia to patients in sickle cell crisis.

## **Background**

Of all hospital admissions related to sickle cell disease in the UK each year, 75% are in London<sup>1</sup>. This is due to London's ethnically diverse population and the fact that sickle cell disease predominantly affects people of African, Caribbean, Middle Eastern, Eastern Mediterranean and Asian origin<sup>2</sup>. In 2015/16 the London Ambulance Service NHS Trust (LAS) attended 4,335 patients in sickle cell crisis.

Sickle cell disease is a hereditary condition characterised by abnormal red blood cells that become sickle shaped due to abnormal haemoglobin, the oxygen-carrying protein within red blood cells<sup>3</sup>. This change in shape can cause blood cells to become stuck in the blood vessels and when this occurs, tissues and organs can be depleted of oxygen, causing severe pain known as a sickle cell crisis.

The LAS first undertook a clinical audit on the care provided to patients in sickle cell crisis in 2004<sup>4</sup>. The clinical audit identified a number of clinical concerns in the management of this patient group, including a lack of oxygen administration, pain relief and intravenous (IV) fluids. In addition a number of patients were inappropriately asked to walk to the ambulance. The audit also raised concerns over the varying time it took for an ambulance to reach patients in sickle cell crisis. These findings led to a change in the triage of sickle cell calls which resulted in Emergency Medical Dispatchers being able to override the Medical Priority Dispatch System (MPDS) and upgrade the call to a faster response. This protocol was subsequently adopted internationally. The findings also informed national sickle cell treatment guidelines in the 2006 and 2009 editions of the UK Ambulance Service Clinical Practice Guidelines<sup>5, 6</sup>. Local quality improvement actions were also put in place, including education for frontline clinicians. To determine whether these actions led to improvements, sickle cell crisis was re-audited in 2011<sup>7</sup>.

The re-audit demonstrated that the care provided to patients in sickle cell crisis had improved in many areas since the original clinical audit; as many more received the correct call triage, a thorough assessment and necessary treatment. However, feedback from the Sickle Cell Society and LAS Patients' Forum suggested further improvement may be required. In light of such feedback, we undertook a further re-audit with the additional component of a questionnaire to understand patients' experiences of the care provided by the LAS when they are in sickle cell crisis.

## **Aims & Objectives**

This clinical audit aimed to:

- Determine whether patients in sickle cell crisis receive the standard of care outlined in UK Ambulance Service Clinical Practice Guidelines 2013
- Assess whether the care delivered to patients in sickle cell crisis has further improved following the previous clinical audit in 2011, particularly with regard to: recording two pain assessments; analgesia administration; supplemental oxygen administration; an ECG for patients with chest pain, and being assisted to the ambulance

- Gain a better understanding of the experiences of patients in sickle cell crisis who are attended by the LAS
- If indicated, develop recommendations to facilitate further improvement

## **Methodology**

### Design

A retrospective clinical audit was undertaken comprised of clinical audit data collection and a patient experience questionnaire.

#### *Clinical audit data collection*

Patients were included if they were attended by the LAS in April 2016 and their corresponding Patient Report Form (PRF) was coded with illness code 59 (sickle cell crisis) (n=361) or their call was triaged as MPDS code 26C3 (Sickle Cell/Thalassaemia) (n=31).

Thirty-four patients (9%) were excluded from the clinical audit, the majority of which were due to misread illness codes by the PRF scanner (n=19). Other exclusions included: the patient was not in crisis (n=8); hospital transfer (n=4); illness code 59 used inappropriately (n=2), and a missing PRF (n=1). This left a total sample size of 358.

Quality Assurance Managers (QAM) in the Emergency Operations Centre Quality Assurance Unit listened to a sample of calls triaged as Red1 or Red2 (eight minute response). All calls had been correctly triaged and the remaining Red1 and Red2 calls did not require review. QAMs assessed a further 35 calls where the patient had been given an alternative MPDS code (such as 26C2) and quality assured each other's reviews to ensure consistency.

The PRFs for 137 patients were clinically reviewed where additional clinical advice was needed on the appropriateness of treatment given, including patients who presented with complications.

#### *Patient experience questionnaire*

Fifty-two patients contacted the LAS for a sickle cell crisis more than once during April 2016. These patients were asked about their last known contact with the LAS and were only sent one questionnaire.

Where NHS Summary Care Records could be found, 224 patients in the sample were sent a hand-written envelope containing a letter (Appendix 1), information sheet (Appendix 2) and a questionnaire (Appendix 3), together with a pre-paid return envelope. The questionnaire contained nine tick-box questions and a free-text box where the patient was asked to provide any additional information if they wished.



## Audit standards

Adherence to the following standards of care derived from the JRCALC Clinical Practice Guidelines for use in UK Ambulance Services<sup>8</sup> was measured.

<b>Aspect of care</b>	<b>Target</b>	<b>Exceptions*</b>	<b>Definitions</b>
<b>Triage</b>			
Call assigned 26C3 MPDS determinant	100%	Call handler not made aware patient in sickle cell crisis; Healthcare Professional (HCP) admission; triaged as higher priority due to symptoms	MPDS, 2008 <sup>9</sup>
Response received within commissioned Category C target	100%	Category A call; call handler not made aware patient in sickle cell crisis; HCP admission; ambulance cancelled after dispatch	OP023 (LAS, 2014) <sup>10</sup>
Where triaged as Category A, response received within target	75%	Category C call; HCP admission; ambulance cancelled after dispatch	OP023 (LAS, 2014) <sup>10</sup>
<b>Assessment and Treatment</b>			
Initial and final pain assessments recorded (pain score or narrative)	100%	Patient unable to communicate; patient unable to understand; patient refused	JRCALC, 2013 <sup>8</sup>
Entonox administered	100%	Pain score <5; contraindication to drug; patient refused; pain assessment not possible; pain score not documented	JRCALC, 2013 <sup>8</sup>
Opiate analgesia administered	100%	Pain score <7; contraindication to drug; patient refused; non-Paramedic crew; pain assessment not possible; pain score not documented	JRCALC, 2013 <sup>8</sup>
Oxygen saturation measured	100%	Patient refused	JRCALC, 2013 <sup>8</sup>
Patient given supplemental oxygen	100%	Patient refused; Entonox administered; SpO <sub>2</sub> >94%	JRCALC, 2013 <sup>8</sup>
12 lead ECG undertaken for patients with chest pain	100%	Patient has no chest pain; patient refused	JRCALC, 2013 <sup>8</sup>
<b>Management</b>			
Patient assisted to ambulance	100%	Patient refused assistance; patient declined hospital	JRCALC, 2013 <sup>8</sup>
Patient's treatment plan followed	100%	Patient doesn't have a treatment plan; HCP admission; patient refused; treatment plan not documented	JRCALC, 2013 <sup>8</sup>
Patient transported to centre where they are normally treated	100%	Patient's condition is life threatening; patient is not assigned a treatment centre; patient refused; HCP admission; treatment hospital is too far from patient location; treatment centre not documented; patient declined hospital	JRCALC, 2013 <sup>8</sup>

\*Concern for crew safety is also an exception for delivering every aspect of care.

Table 1: Clinical audit standards

## Data analysis

### *Clinical audit data collection*

Data were entered into a Statistical Package for the Social Sciences (SPSS) database and analysed using descriptive statistics. When comparing with the 2004 and 2011 audit findings, all percentage changes are percentage point increases or decreases.

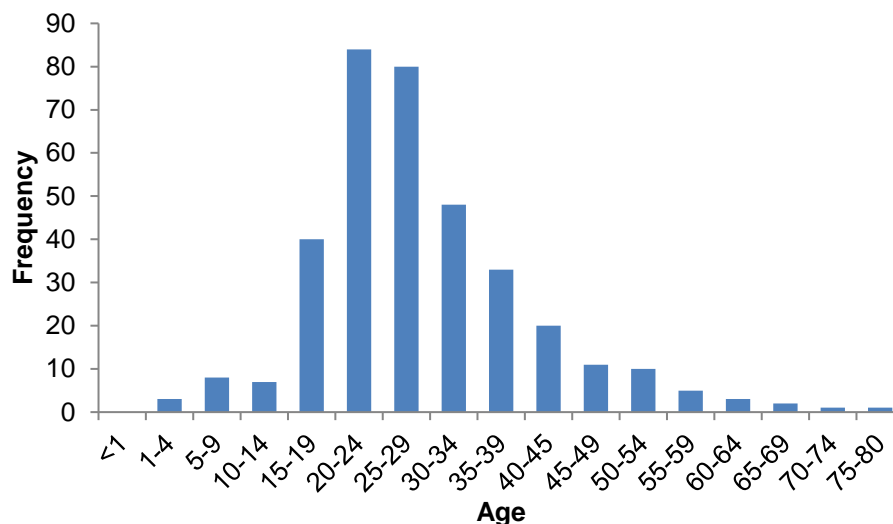
### *Patient experience questionnaire*

Data were entered into Microsoft Excel and analysed using descriptive statistics. The free-text responses to the questionnaire were analysed using Thematic Analysis.

## **Results**

### Patient demographics

The majority of patients were male (52%, n=185/358), with a mean age of 29 years (ranging from 1 to 78 years), as shown in Figure 1.



*Figure 1: Age range of patients in sickle cell crisis*

On 152 occasions, the patient did not wish to state their ethnicity/were unable to due to their condition (n=93) or the ethnicity code was left blank (n=59). Where an ethnicity code was given, over half of patients stated they were Black or Black African (64%, n=131/206). The majority of attendances were at a private address (87%, n=312).

## Results: Clinical Audit

### Call triage

Aspect of care	Exceptions n	Sample n	Compliant n (%)	Non-compliant n (%)	% change since 2011	% change since 2004
Call assigned 26C3 MPDS determinant	91	267	243 (91%)	24 (9%)	+25%	NC
Response received within commissioned Category C target	84	274	229 (84%)	45 (16%)	NC	NC
Where triaged as Category A, response received within target	283	75	34 (45%)	41 (55%)	NC	NC

*Table 2: Compliance with clinical audit standards (call triage)*

Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%, NC: Not Comparable<sup>ii</sup>

### Call triage

Ninety-one patients were exempt from receiving MPDS determinant 26C3 as the call was: triaged as a R1 or R2 response (n=75); deemed to have been assigned an appropriate following call review (n=8); the caller did not mention sickle cell (n=4), or the call was a HCP admission (n=4).

Where the call handler was informed that the patient was in sickle cell crisis and they had no high priority symptoms, 91% were correctly assigned MPDS determinant 26C3 (n=243); a 25% increase compared with the previous clinical audit. Nine percent (n=24) were incorrectly assigned another determinant, with most triaged as 26C2 'Sick Person Abnormal Breathing' (67%, n=16), followed by 26D1 'Sick Person Not Alert' (25%, n=6).

Nearly all calls were received when the Service was operating at Surge Red under the LAS Demand Management Plan (99%, n=356). Under this surge level, the response time for R1 and R2 calls remains at eight minutes; however, the C1 commissioned response time is extended from 19 to 45 minutes:

- Just under half of R1 and R2 calls met response target time (45%, n=34)
- Over three-quarters of C1 calls met the surge level response target time (84%, n=228). In fact, 59% of these calls received a response within 19 minutes (n=159).

<sup>ii</sup> This aspect of care is not comparable to the previous clinical audit as it was not measured or reported

Two further calls were received when the Service was in Surge Purple (when the C1 target is extended to one hour) and one patient received a response within this target.

The median response time for calls was 14 minutes (ranging from 2 to 191 minutes), an increase of 6 minutes compared with our previous clinical audit. Response times to 16 C1 calls were not assessed where: the caller did not mention sickle cell (n=11); the call was a HCP admission (n=4), and the vehicle was cancelled en-route (n=1).

On two occasions an ambulance was dispatched and the call was then cancelled by the patient whilst the vehicle was en-route, or the patient was not on-scene when the clinicians arrived. These two patients did not receive treatment and are therefore excluded from the remaining standards in this clinical audit, giving a sample size of 356.

## Assessment and treatment

Aspect of care	Exceptions n	Sample n	Compliant n (%)	Non- compliant n (%)	% change since 2011	% change since 2004
Initial and final pain assessments recorded (pain score or narrative)	6	350	316 (90%)	34 (10%)	+28%	+49%
Entonox administered	28	328	301 (92%)	27 (8%)	-3%	+30%
Opiate analgesia administered	134	222	142 (64%)	80 (36%)	+16%	+57%
Oxygen saturation measured	0	356	353 (99%)	3 (1%)	NC	+7%
Patient given supplemental oxygen	347	9	9 (100%)	0 (0%)	+27%	+25%
12 lead ECG undertaken for patients with chest pain	219	137	113 (82%)	24 (18%)	+53%	NC

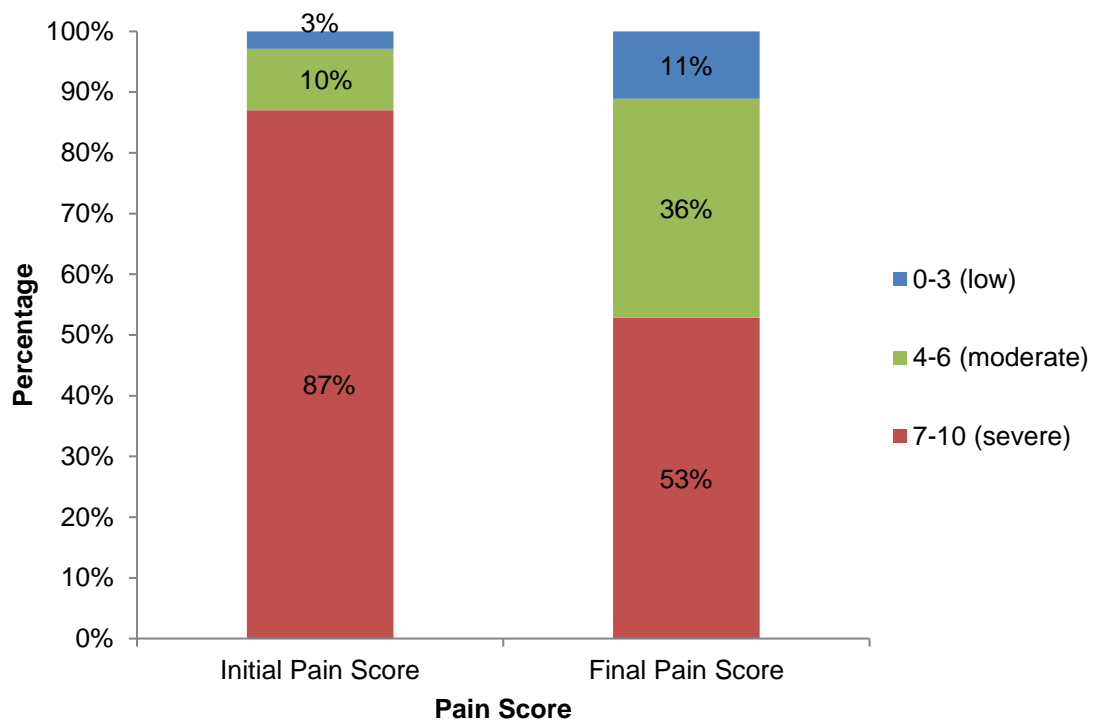
*Table 3: Compliance with clinical audit standards (assessment and treatment)*  
Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%; NC: Not Comparable<sup>iii</sup>

### Pain assessments

Clinicians were not able to obtain a pain assessment for six patients who were either unable to communicate (n=3) or refused to report their pain (n=3). Of the remaining patients, both an initial and final pain assessment were recorded for 90% (n=316/350), a 28% and 49% increase from the 2011 and 2004 clinical audits respectively. For the 34 patients (10%) who did not have two pain assessments recorded, 30 (88%) had only an initial assessment and four (12%) had no assessment at all.

Two-thirds of patients (66%, n=208) reported a decrease in pain. The remaining 108 patients (34%) saw no improvement in their pain, five of whom in fact reported an increase. The proportion of initial and final pain assessments are shown in Figure 2.

<sup>iii</sup> This aspect of care is not comparable to the previous clinical audit as it was not measured or reported



*Figure 2: Initial and final pain scores of patients in sickle cell crisis<sup>iv</sup>*

#### Appropriate analgesia administered

When taking all forms of analgesia and circumstances in to account, 59% of patients (n=209) received appropriate overall pain management. Reasons for inappropriate pain management are listed in Appendix 4.

92% of patients who reported a pain score above five received Entonox (n=301/328), which is a 30% increase from 2004 and a slight decrease of 3% from 2011. For the remaining 27 patients, it was not recorded whether the clinician offered Entonox.

Patients who report being in severe pain should receive opiate analgesia. Morphine was given to 64% (n=142/222) of eligible patients, a 16% and 57% increase from the findings in 2011 and 2004. No reason was documented as to why the remaining eighty eligible patients (36%) who did not receive morphine. In order to draw a comparison with our previous clinical audits, the administration of morphine was not assessed for 134 patients because they either: did not have a pain score of seven or above (n=52); refused (n=34); were attended by a non-paramedic crew who cannot administer opiates (n=33), or the patient had a contraindication to opiates (n=15).

Over half of patients (67%, n=240) had taken their own analgesia prior to the arrival of the LAS. However, for 34 of these patients (14%), it was not documented which analgesia had been taken. A number of patients had taken opiate analgesia prior to LAS arrival, some of which reached the maximum dose of 20mg.

<sup>iv</sup> Half scores (such as 8.5) were rounded up to fit a whole pain score and narrative pain assessments were matched to the corresponding category

## Medicines management

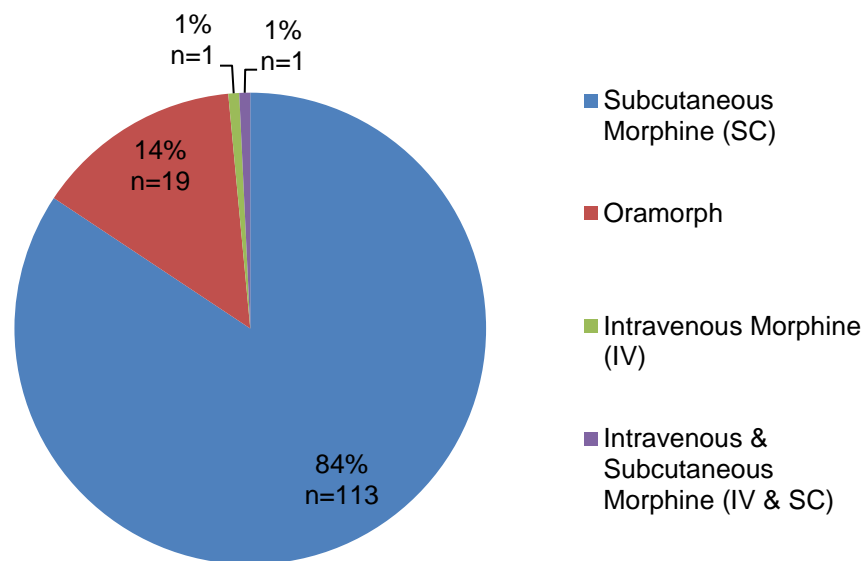
	Exception n	Relevant Sample n	Compliant n (%)	Non-compliant n (%)
Route appropriate	207	149	134 (90%)	15 (10%)
Dose appropriate	208	148	148 (100%)	0 (0%)
Drug pack code documented	333	23	13 (56%)	10 (44%)
Drug wastage documented	230	126	60 (48%)	66 (52%)

*Table 4: Medicines management for opiate administration*

Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%

### Route

Ninety percent of patients received opiate analgesia via the appropriate route (n=134/149), the most common of which was subcutaneous, illustrated in Figure 3.



*Figure 3: Appropriate routes of morphine administration<sup>v</sup>*

Fifteen patients (10%) received opiate analgesia via a route outside guidelines: intravenously (n=7), intramuscularly (n=4) or it was given orally for severe pain (n=4).

### Dose

Where dosage was recorded (n=148/149), all patients were given the correct dose of morphine. The most common dose was 10mg (60%, n=89), followed by 5mg (26%, n=39) and 20mg (5%, n=7).

<sup>v</sup> In accordance with patients' treatment plan

### *Drug pack code*

Where a drug from the drug pack was administered (Oramorph), the drug pack code was recorded on 56% of PRFs (n=13/23).

### *Drug wastage*

As morphine for injection is a controlled drug, all amounts must be accounted for and crews should document whether or not there is any drug wastage. Of the patients who received IV, SC or IM morphine (n=126), the drug wastage section of the PRF was fully completed for 48% of patients (n=60). Non-compliance was mainly due to the drug wastage section not being signed or countersigned by crew members (88%, n=58/66) or the section was left blank (12%, n=8/66).

### Oxygen saturation

Oxygen saturation was measured for all but three patients (99%, n=353), a 7% increase from the 2004 clinical audit. All patients whose oxygen saturation was below 94%, and who were not given Entonox for pain relief, were given supplemental oxygen (100%, n=9); an increase of 27% and 25% from the previous audit findings in 2011 and 2004 respectively. An additional 17 patients received supplemental oxygen when their saturation reading was above 94%.

### Chest pain & ECG

Of the 137 patients who were documented as experiencing chest pain and did not refuse an ECG, 82% (n=113) had one carried out, a 53% increase compared with the previous clinical audit. The crew documented a suspicion of Acute Chest Syndrome (ACS) for three patients with chest pain (2%).

### IV fluids and rehydration

No patients in the sample were documented as being clinically dehydrated.



## Management

Aspect of care	Exceptions n	Sample n	Compliant n (%)	Non- compliant n (%)	% change since 2011	% change since 2004
Patient assisted to ambulance	13	343	205 (60%)	138 (40%)	+7%	0%
Patient's treatment plan followed	308	48	45 (94%)	3 (6%)	NC	NC
Patient transported to centre where they are normally treated	74	282	275 (98%)	7 (2%)	+11%	+17%

*Table 5: Compliance with clinical audit standards (management)*

Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%; NC: Not Comparable

### Assistance to ambulance

Over half of patients were assisted to the ambulance (60%, n=205), which is a 7% increase compared with the findings in 2011. For the remaining patients, it was not clear whether or not the patient was assisted (69%, n=95/138) or patients walked to the ambulance (31%, n=43/138). Nine patients declined assistance to the ambulance and four refused conveyance to hospital.

### Treatment plan

A large number of patients did not have a treatment plan documented on their PRF (96%, n=295), so we were unable to determine if a treatment plan was followed. It was not possible to assess whether crews followed the patients' treatment plan for a further 13 patients who: did not possess a treatment plan (2%, n=7); refused to follow their treatment plan (1%, n=3), or were a HCP admission and their care had already been initiated by another healthcare provider (1%, n=3).

For the remaining 48 patients, a treatment plan was documented and followed on 94% of occasions (n=45).

### Transported to usual treatment centre

Nearly all patients were taken to the centre where they are normally treated when in sickle cell crisis (98%, n=275), an increase of 11% and 17% from the 2011 and 2004 clinical audits respectively.

Whether or not the patient was taken to their usual treatment centre could not be determined for 74 patients as: a treatment centre was not documented (n=55); patients wanted to be taken to an alternative centre (n=7); patients declined hospital (n=4); patients did not have a treatment centre (n=4); the call was a HCP admission (n=3), or the treatment centre was deemed too far and the patient agreed to go to an alternative centre (n=1).

## Results – Patient Questionnaire

Seventy-three questionnaire responses were received from patients, a response rate of 33%. Over half of patients gave additional feedback in the free-text box. The themes of most free-text responses corresponded with questions asked in the questionnaire. Additional themes included: call triage, treatment centre conveyance and the patient’s overall opinion of the LAS, details of which are in Appendix 5.

Q1: When a caller phones 999 and informs the LAS they are having a sickle cell crisis, we aim to get a car or ambulance to them within 20 minutes when the Service isn’t under severe pressure. When you called the LAS on this occasion, do you feel you waited an appropriate length of time?

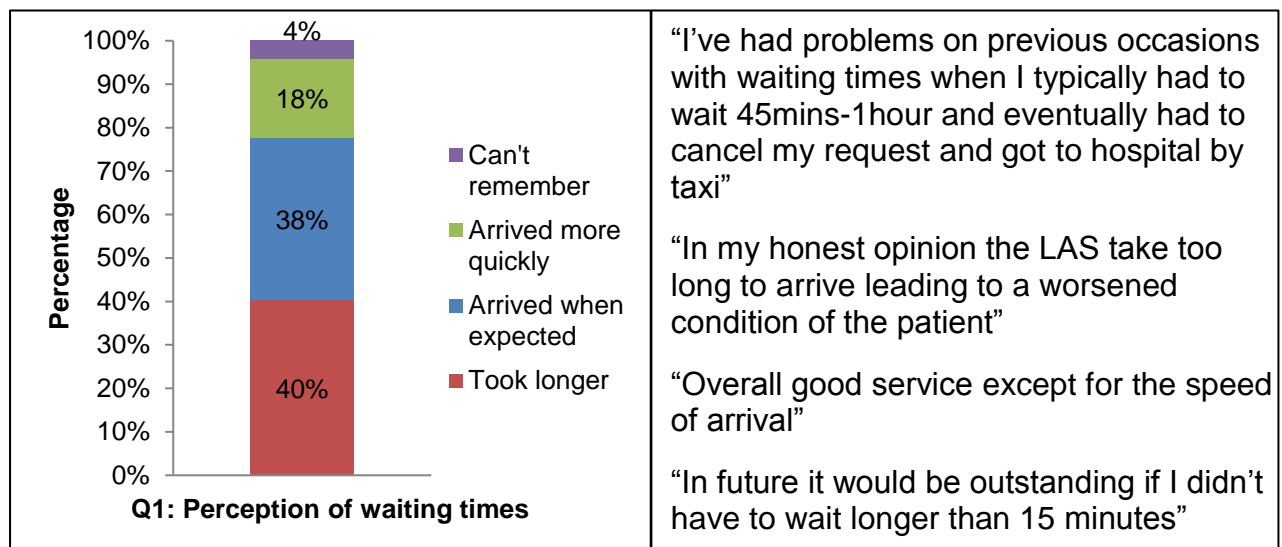


Figure 4: Patients’ perception of waiting times when in sickle cell crisis

Anonymous record linkage to the clinical audit data showed that patients who felt the ambulance took longer had an average response time of 32 minutes.

Q2: Did the ambulance clinician(s) ask you how much pain you were in?

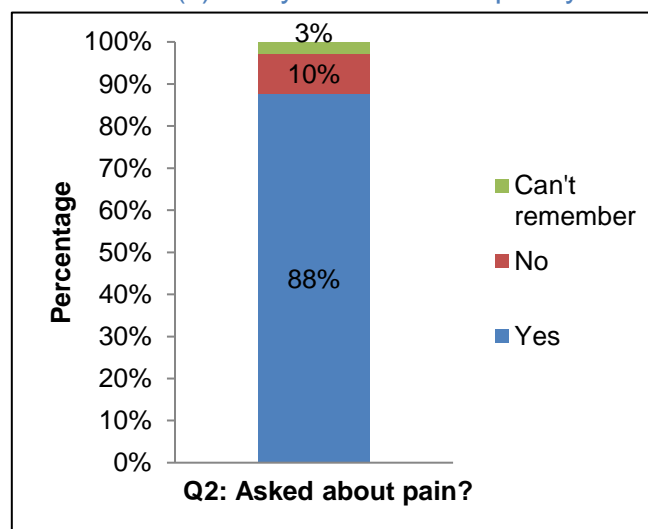
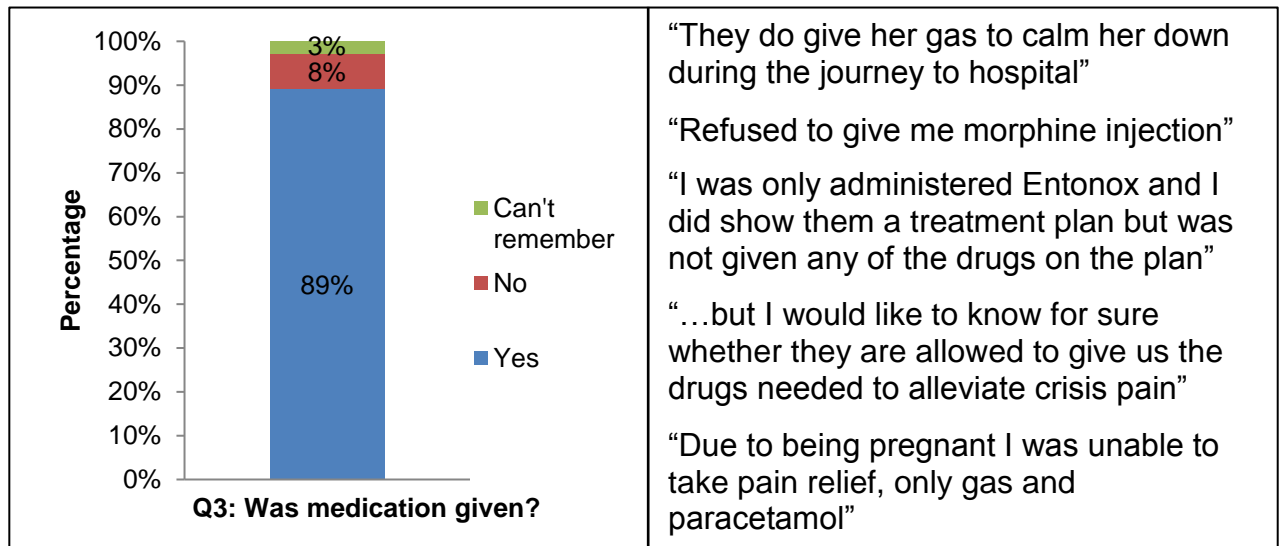


Figure 5: Patients’ responses regarding clinicians conducting a pain assessment

Matching the questionnaire responses to the clinical audit data in fact showed that all patients who responded to the questionnaire had an initial pain score documented.

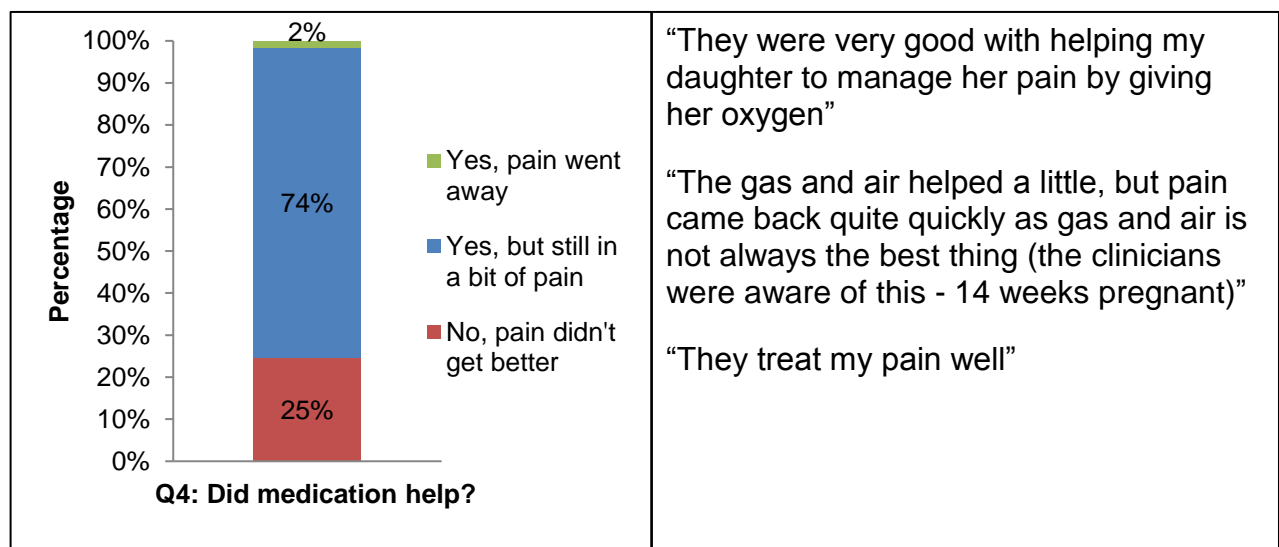
Q3: If you were in pain, did the ambulance clinician(s) give you medication/drugs to relieve the pain?



**Figure 6: Patients' responses on receiving medication whilst in sickle cell crisis**

Six patients (8%) stated they were not provided with pain relief and from looking at their PRFs: three had a contraindication; two were not given opiate analgesia with no reason documented, and one was given analgesia.

Q4: If the ambulance clinician(s) gave you pain relief, did this help with your pain?



**Figure 7: Patients' perception regarding the effect of the medication administered**

The PRFs showed that patients who stated the analgesia given helped with their pain were more likely to have been given 10mg of morphine or above (72%, n=18/25), compared to patients who patients who stated their pain did not get any better (43%, n=3/7).

Q5: Did the ambulance clinician(s) offer to assist you (by using a carry chair or stretcher) so you didn't have to walk to the ambulance?

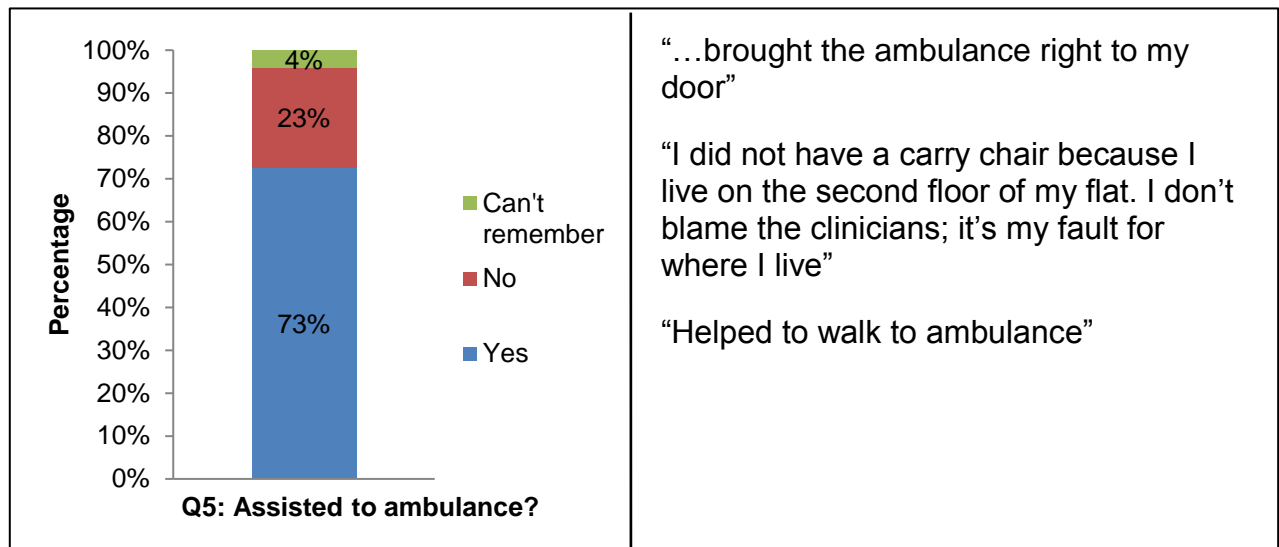


Figure 8: Patients' responses regarding assistance to the ambulance

Seventeen patients (23%) stated that they were not offered assistance to the ambulance. Clinicians recorded using a trolley bed or carry chair and trolley bed for ten of these patients.

Q6: On this occasion, did the ambulance clinician(s) ask whether you have a treatment plan or “passport” detailing what treatment helps you best in a crisis?

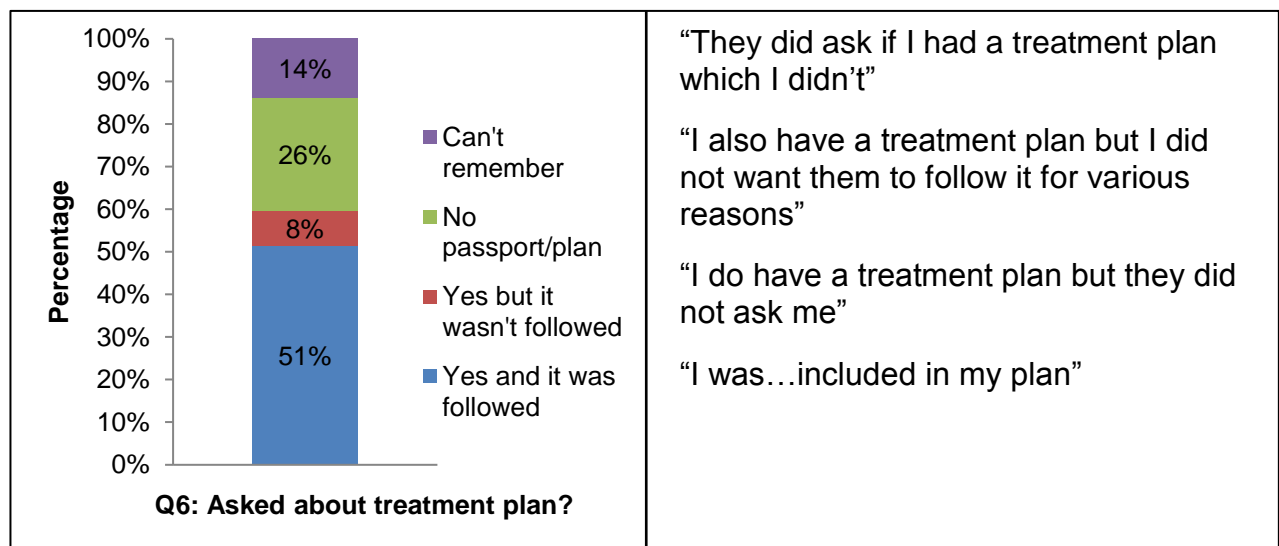


Figure 9: Patients' responses regarding treatment plans

Fifty-nine of the patients who responded to the questionnaire did not have a treatment plan documented on their PRF. However, the patients' responses show that over half of these patients had in fact been asked about their treatment plan (61%, n=36/59).

Q7: Do you feel the ambulance clinician(s) treated you with a sense of urgency?

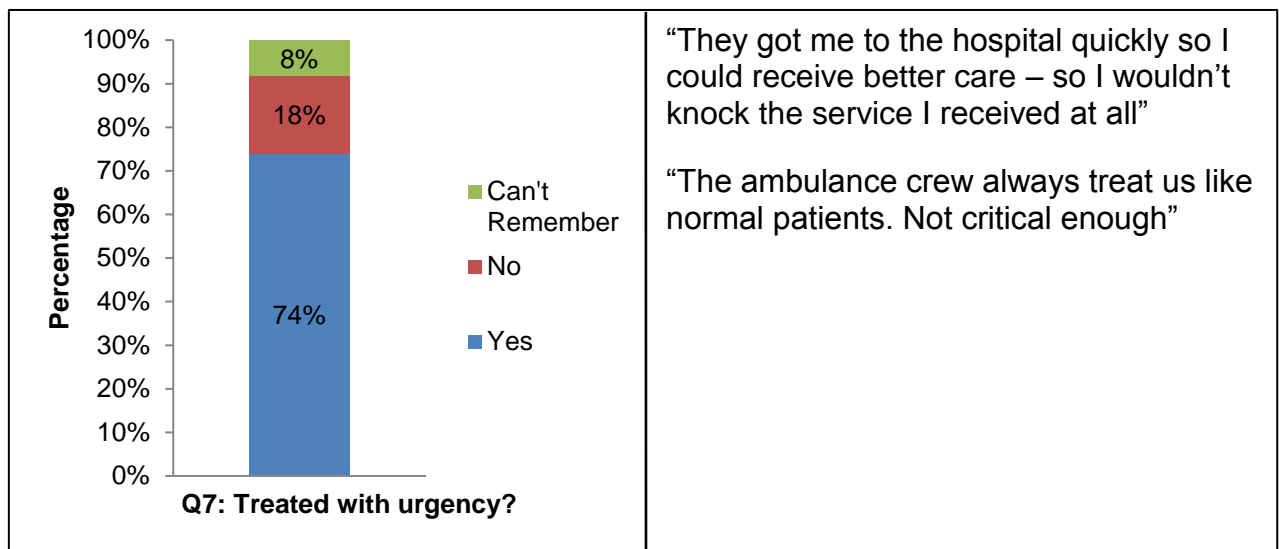


Figure 10: Patients’ perception of the urgency of treatment

Patients’ opinions did not mirror the average time spent one scene as patients who felt they were treated with a sense of urgency by ambulance clinicians had a longer average on-scene time (34 minutes) compared to those who felt they were not (31 minutes).

Q8: How would you rate the courtesy of the ambulance clinician(s)?

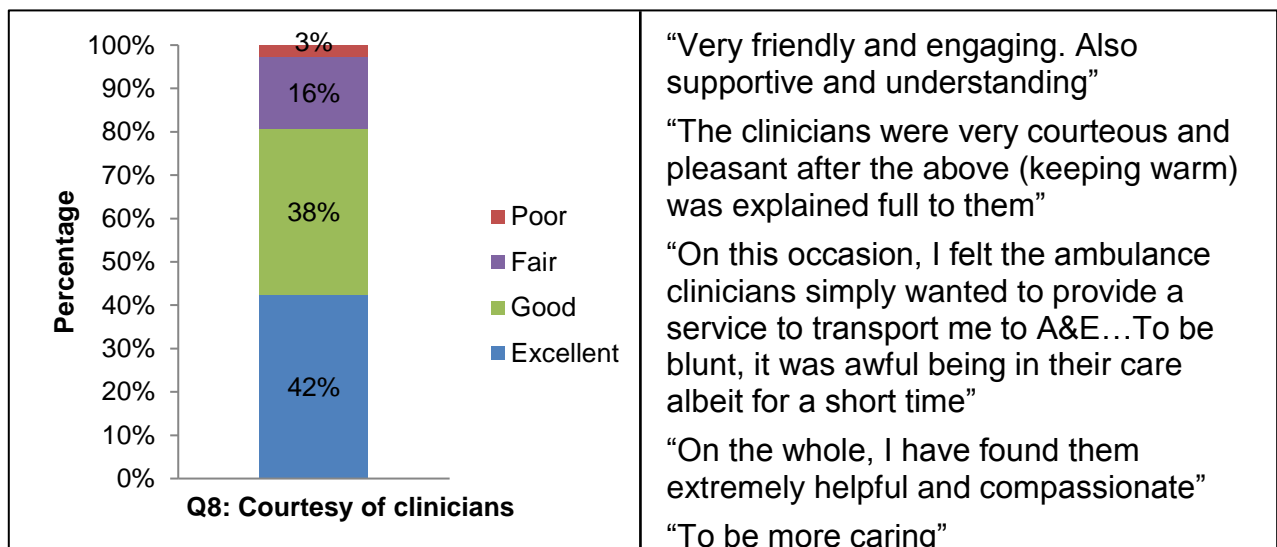


Figure 11: Patients’ perception of the courtesy of the ambulance clinicians

Patients’ perceptions of clinician courtesy were supported by the patients’ free-text responses, where the vast majority of patients felt crews were friendly, caring and compassionate.

Q9: Do you agree or disagree with the following statement? On this occasion, I felt the ambulance clinician(s) had a good understanding of sickle cell anaemia.

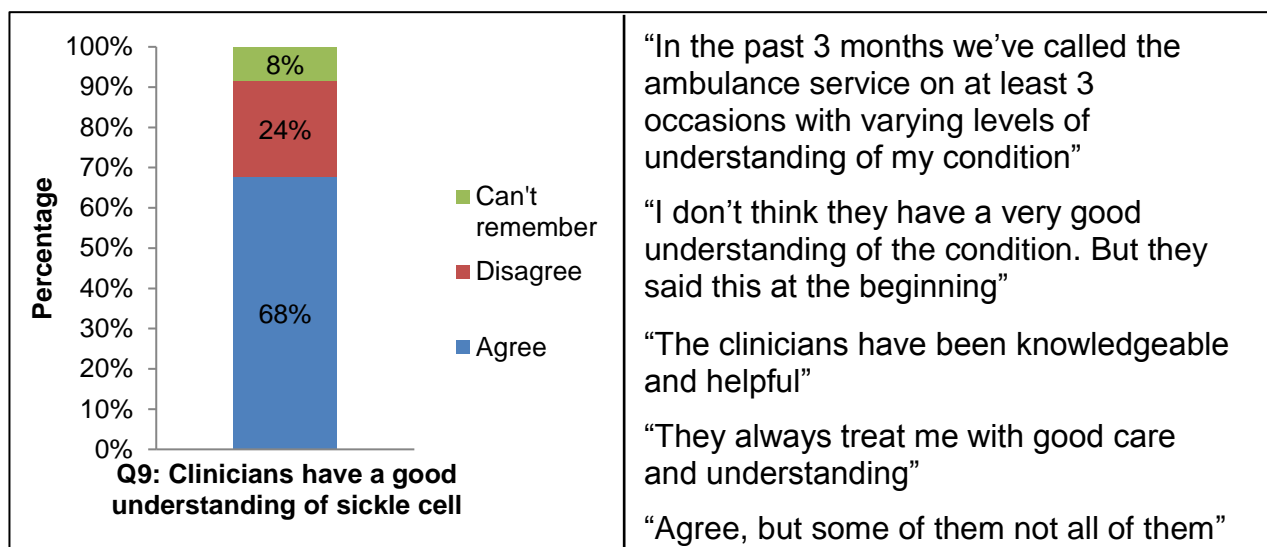


Figure 12: Patients’ perception of clinician understanding of sickle cell anaemia

A large proportion of patients (68%, n=48) believed clinicians have a good understanding of sickle cell anaemia. Some free-text responses indicated that the level of understanding varied between clinicians.

## Discussion

The overall results show that the care delivered to patients in sickle cell crisis has improved in recent years and is of a high standard. Further progress is needed in providing adequate pain relief and the remaining areas for improvement are mainly related to internal procedures, such as medicines management.

Use of the sickle cell MPDS determinant (26C3) has increased since the last clinical audit and nearly nine out of ten calls in the sample were triaged appropriately, with feedback having been provided to call handlers who triaged calls incorrectly. We will remind current EOC staff of the correct sickle cell triage in an EOC Quality Assurance Bulletin and inform new staff in their Clinical Audit and Research Unit induction session. Patients can also help the LAS when they dial 999 by informing the call handler they are suffering a sickle cell crisis and cancelling an ambulance when no longer required, both of which will be included in an article for the Sickle Cell Society newsletter.

The average response time for patients in sickle cell crisis has increased by approximately fifteen minutes compared with the previous clinical audit. However, the LAS attended 35% more life threatening calls in 2015/16 (which receive an eight minute response), meaning the Service has fewer resources available for calls triaged as Category C. Questionnaire responses indicated that ambulance waiting times were the poorest part of the Service and as a result, expected waiting times for patients in a crisis without complication will also be included in the newsletter Sickle Cell Society newsletter.

We have seen an increase in the number of patients who had two pain assessments recorded. However, there were still some patients who had their pain assessed only once and some did not have a pain assessment recorded at all, meaning we cannot determine whether the most appropriate form of analgesia was given. Since the previous clinical audit, the use of Entonox has decreased slightly, whilst opiate use has increased. Despite this, some responses to the questionnaire highlighted a perceived reluctance from crews to administer opiate analgesia. There were also cases where the dose of morphine given was insufficient. In cases where patients were still in severe pain despite having the maximum dose of 20mg, crews could have contacted the Clinical Hub for advice on whether to administer further analgesia.

To ensure crews are aware of the analgesic regimen patients in sickle cell crisis should receive, we will share our findings with the tutors delivering the face-to-face Core Skills Refresher (CSR) training delivered to each member of frontline staff. CARU will also write an article for the Clinical Update to ensure crews are aware of: the importance of obtaining two pain assessments; appropriate pain management, and the option of contacting the Clinical Hub for advice when the maximum dose of morphine has been reached. To inform the Clinical Update article, the Senior Clinical Advisor to the Medical Director will seek advice from sickle cell specialists on pharmacology, specifically when it's safe to administer further pain relief if a patient has taken their own, plus the maximum initial and total dose of morphine crews should safely be able to administer.

For the small proportion of patients who had a treatment plan documented, it was followed on the majority of occasions. Questionnaire responses indicate that the majority of the remaining patients had been asked about their treatment plan but it had not been documented. Questionnaire responses also highlighted that some patients did not have a treatment plan. As a result, we will recommend that the Sickle Cell Society liaises with Sickle Cell Centres in London to ensure that patients have a physical treatment plan where appropriate, such as when their analgesic regimen deviates from UK Ambulance Service Clinical Practice Guidelines. The Clinical Update article will also emphasise the importance of crews asking patients whether they have a treatment plan and following it.

Following the LAS' recent Care Quality Commission (CQC) inspection<sup>11</sup>, the Service has paid particular attention to medicines management. Whilst the majority of patients were given the correct dose of morphine via the appropriate route, drug wastage was recorded on a smaller number of occasions. Recording drug pack codes also requires improvement; however, it should be acknowledged that this audit data is from April 2016 and the Service has continued its work on medicines management in recent months. In order to contribute to recent initiatives, this report will be shared with the Medicines Management Group.

Regarding other on-scene treatment, nearly all patients had their oxygen saturation levels measured and there was an increase in the provision of supplemental oxygen. Considerably more patients with chest pain also had an ECG carried out, enabling clinicians to recognise the presence or absence of Acute Chest Syndrome, a very serious complication and leading cause of death in sickle cell crisis<sup>8</sup>. An improvement was also seen in the number of patients assisted to the ambulance,

which is crucial for patients in sickle cell crisis, as walking exacerbates hypoxia (oxygen deprivation) in the tissue. The majority of patient questionnaire responses indicated that they were assisted, but it is not always documented by crews. As a result, this will be reiterated in the Clinical Update article. Nearly all patients were conveyed to the centre where they are usually treated when in a sickle cell crisis, an improvement on our previous findings.

Patient feedback was the trigger for undertaking this clinical audit. As a result, we will share this report with the LAS Patients' Forum and Sickle Cell Society to demonstrate the improvements in patient care. An infographic presenting the key findings will also be sent to stations and shared on the Service's Listening into Action (LiA) Facebook page to stimulate discussion amongst frontline staff.

Despite some areas for improvement, it is positive that the majority of patients rated clinician courtesy as good or excellent, and most agreed that LAS clinicians had a good understanding of sickle cell. Through the aforementioned recommendations it is hoped that the care provided to patients in sickle cell crisis will further improve. To assess this we will re-audit the administration of opiate analgesia in sickle cell crisis, the clinical aspect of care in need of most improvement, once the actions have had sufficient time to take effect.



## Recommendations and Actions

	Recommendation	Action	Responsible Officer	Director	Deadline
1	Ensure sickle cell patients have a copy of their treatment plan, where appropriate	Recommend to the Sickle Cell Society that they liaise with Sickle Cell Centres in London to ensure that, where appropriate, patients have a copy of their treatment plan	Clinical Audit Officer	Chief Quality Officer	February 2017
2	Provide crews with guidance on pharmacology, specifically: <ul style="list-style-type: none"> <li>• When it is safe to give morphine after it has already been taken</li> <li>• The maximum initial and total doses of morphine for patients in crisis</li> </ul>	Seek advice from sickle cell specialists	Senior Clinical Advisor to the Medical Director	Chief Quality Officer	February 2017
3	Ensure patients with sickle cell are aware of: <ul style="list-style-type: none"> <li>• The importance of informing Call Handlers when they are in crisis and cancelling an ambulance</li> <li>• Target response times</li> <li>• LAS capabilities such as pain management</li> </ul>	Write an article for the Sickle Cell Society newsletter and website	Clinical Audit Officer	Chief Quality Officer	March 2017
4	Share findings with the tutors conducting the face-to-face CSR training	Share the clinical audit findings	Clinical Audit Officer	Chief Quality Officer	December 2016

	<b>Recommendation</b>	<b>Action</b>	<b>Responsible Officer</b>	<b>Director</b>	<b>Deadline</b>
5	The key findings of this clinical audit will be presented to frontline staff in a Clinical Update article, including the importance of: <ul style="list-style-type: none"> <li>• Both pain scores</li> <li>• Appropriate pain management and contacting the Clinical Hub</li> <li>• Assistance to ambulance</li> <li>• Treatment plans</li> </ul>	Write a Clinical Update article	Clinical Audit Officer	Chief Quality Officer	April 2017
6	Feedback will be provided to call handlers who triaged calls incorrectly	Discuss the correct sickle cell triage with call handlers involved	Quality Assurance Manager	Deputy Director of Operations – Control Services	December 2016
7	Disseminate key findings to clinicians and encourage discussions relating to the findings	Produce an infographic for dissemination to stations and share on LiA	CARU Staff Engagement Facilitator	Chief Quality Officer	March 2017
8	The Medicines Management Group are informed of the findings regarding medicines management	Share the clinical audit report	Clinical Audit Officer	Chief Quality Officer	December 2016
9	Report is shared with the LAS Patients' Forum and Sickle Cell Society	Share the clinical audit report	Clinical Audit Officer	Chief Quality Officer	December 2016
10	Ensure call handlers are aware of the correct sickle cell triage in MPDS and the documentation of usual treatment centre	Produce an article for a Quality Assurance Bulletin	Clinical Audit Officer	Chief Quality Officer	March 2017

	<b>Recommendation</b>	<b>Action</b>	<b>Responsible Officer</b>	<b>Director</b>	<b>Deadline</b>
11	Future EOC staff are informed of the key messages in this clinical audit	Amend the CARU induction talk for EOC staff to include audit findings	Clinical Audit Manager	Chief Quality Officer	February 2017
12	Assess whether the recommendations have led to an improvement in the number of patients given opiate analgesia	Re-audit the administration of opiate analgesia to patients in sickle cell crisis	Clinical Audit Manager	Chief Quality Officer	March 2020

Table 6: Recommendations and actions

## References

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11. Care Quality Commission, 2015. London Ambulance Service NHS Trust Quality Report. London: Care Quality Commission.

## Cost Analysis

Table 7 shows a breakdown of the approximate cost of this clinical audit project. Cost analysis is reported to provide the Service with an understanding of the resources involved in conducting this clinical audit project.

<b>Description of staff activity</b>	<b>Approximate Cost</b>
Project design	£989.47
Data collection	£897.61
Quality assurance	£65.52
Clinical review/advice	£286.07
Data analysis	£214.71
Report write up	£341.01
Feedback on report	£499.84
Report re-drafting	£972.89
Report to LAS multidisciplinary Clinical Audit and Research Steering Group	£90.92
Management Information	£48.26
Stationery (mail outs)	£239.81
<b>Total</b>	<b>£4,646.11</b>

Table 7: Cost analysis for this clinical audit project



**Appendix 1: Letter to patient**  
[MAIL MERGE ADDRESS]

**Clinical Audit and Research Unit**  
HQ Annexe  
8-20 Pocock Street  
London  
SE1 0BW  
Tel: 020 7783 2584  
emily.cannon@londonambulance.nhs.uk  
www.londonambulance.nhs.uk

[DATE]

Dear [NAME],

**RE: The care provided to patients in sickle cell crisis by the London Ambulance Service NHS Trust**

Following your use of the London Ambulance Service on [DATE] for a call related to a sickle cell crisis, I am writing to invite you to participate in a project looking at how we treat patients who have used our service.

Participation in the project is entirely voluntary and your decision to participate or opt-out of the project will not in any way reflect on future health care provided to you. Further information on the project is provided on the enclosed participant information sheet. If, after reading the information, you would like to take part in the study, please complete the questionnaire and return in the enclosed pre-paid envelope by Monday 27<sup>th</sup> June 2016. If you do not wish to participate in the project, please ignore this letter and any future correspondence regarding the clinical audit.

Please contact me using the details above if you need any assistance in completing the questionnaire or have any questions about the clinical audit.

Yours Sincerely,

Emily Cannon  
Clinical Audit Officer

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Si vous désirez recevoir ce document en français, cochez cette case et renvoyez ce formulaire en utilisant l'enveloppe préaffranchie fournie

Please specify here if you would like these documents in another language, and return this slip in the pre-paid envelope provided \_\_\_\_\_



## Appendix 2: Patient information sheet

### **Participant Information Sheet: The care provided to patients in sickle cell crisis by the London Ambulance Service NHS Trust**

I would like to invite you to take part in a project that aims to ensure high quality care is provided by the London Ambulance Service NHS Trust (LAS) to patients who call us because they are in sickle cell crisis. Before you decide whether or not you wish to participate, please read the following information carefully. If you have any questions, please contact me via the details overleaf.

#### **What is the purpose of the study?**

The study will review the quality of care given to patients in sickle cell crisis attended by the LAS to assess how well we treat our patients. We are interested in the care we deliver from the moment a request for an ambulance is made, until you are taken to hospital. By looking into this, we can ensure we provide a high quality service to patients who are in sickle cell crisis.

#### **Why have I been chosen?**

You are being invited to participate because according to our records, the LAS was called for you in April 2016 for emergency care relating to sickle cell.

#### **Do I have to take part?**

No – participation in the project is voluntary. If you do not wish to complete the questionnaire please ignore this letter and any related correspondence.

#### **What do I have to do?**

If you are happy to participate, we would like you to complete a short questionnaire that looks at your experience with the LAS. By completing the questionnaire, you consent to the LAS including your answers, together with any quotes you provide, in the project. The questionnaire is enclosed and will take you approximately ten minutes to complete. After finishing the anonymous questionnaire, you should return it in the enclosed pre-paid addressed envelope by Monday 27<sup>th</sup> June 2016.

#### **What are the possible benefits and risks of taking part?**

By taking part in the study, you will help us identify what we are doing well and what we can do to improve the service we provide to all future patients with sickle cell. There are no known risks associated with taking part in the questionnaire and we have made every attempt to sensitively address the issues we wish to explore. However, should you wish to seek advice or support as a result of taking part in the questionnaire, please contact the LAS Patient Experiences Department on 020 3069 0240 or email [ped@londonambulance.nhs.uk](mailto:ped@londonambulance.nhs.uk).

**Will my taking part in the study be kept confidential?**

Yes - in line with ethical and legal practices, all information will be treated confidentially. To ensure this, patient names and addresses will only be viewable by four clinical audit staff and will be deleted 28 days after the final questionnaire is sent out. Your responses will be anonymous and not linked to your personal information.

**What will happen to the results of the clinical audit?**

The results of the clinical audit will be published within the LAS and may be published outside the Service. You will not be identified in any report or publication. The report will also be shared with the LAS Patients' Forum and The Sickle Cell Society.

**Who has organised and reviewed the study?**

This project is part of an internal quality improvement programme organised and undertaken by the LAS. For your information, the project has been reviewed and approved by the LAS Caldicott Guardian to ensure that data will be used in line with the Data Protection Act 1988 and NHS Confidentiality Code of Practice 2003.

**Further information**

If you have a formal compliment or complaint about the care you received from the LAS, we have a Communications Department who process compliments, and a Patient Experiences Department who process formal complaints. Should you wish to formally provide either of these; further details can be found on the London Ambulance Service website:

[http://www.londonambulance.nhs.uk/talking\\_with\\_us.aspx](http://www.londonambulance.nhs.uk/talking_with_us.aspx).

If you have any questions or concerns regarding the project, please contact Emily Cannon (LAS Clinical Audit Officer) at:

London Ambulance Service NHS Trust  
HQ Annexe  
8-20 Pocock Street  
London  
SE1 0BW

Tel: 020 7783 2584

Email: [emily.cannon@londonambulance.nhs.uk](mailto:emily.cannon@londonambulance.nhs.uk)





### Appendix 3: Patient questionnaire

#### The care provided to patients in sickle cell crisis by the London Ambulance Service

Please complete the following questionnaire regarding the care provided by the London Ambulance Service NHS Trust (LAS) on the date stated in the enclosed letter.

By completing this questionnaire, you consent to both taking part in the project, and the LAS including your answers and quotes in the project. Participation is entirely voluntary and if you choose not to participate, this will not in any way reflect future health care provided to you. Your responses will be anonymised and stored confidentially. If you have any questions about the project, please contact Emily Cannon, LAS Clinical Audit Officer, on 020 7783 2584.

**1) When a caller phones 999 and informs the LAS they are having a sickle cell crisis, we aim to get a car or ambulance to them within 20 minutes when the Service isn't under severe pressure. When you called the LAS on this occasion, do you feel you waited an appropriate length of time?**

- The LAS arrived more quickly than I expected
- The LAS arrived when I expected
- The LAS took longer to arrive than I expected
- Can't remember / don't know

**2) Did the ambulance clinician(s) ask you how much pain you were in?**

- Yes
- No
- Can't remember / don't know

**3) If you were in pain, did the ambulance clinician(s) give you medication/drugs to relieve the pain?**

- Yes
- No  
(go to Question 5)
- Can't remember / don't know  
(go to Question 5)
- I wasn't in pain  
(go to Question 5)

**4) If the ambulance clinician(s) gave you pain relief, did this help with your pain?**

- Yes, my pain went away completely
- Yes, but I was still in a bit of pain
- No, my pain didn't get any better
- Can't remember / don't know

5) Did the ambulance clinician(s) offer to assist you (by using a carry chair or stretcher) so you didn't have to walk to the ambulance?

- Yes                       No                       Can't remember / don't know

6) On this occasion, did the ambulance clinician(s) ask whether you have a treatment plan or "passport" detailing what treatment helps you best in a crisis?

- Yes, and the ambulance clinician(s) followed it  
 Yes, but the ambulance clinician(s) did not follow it  
 No, I do not have a patient "passport" or treatment plan  
 Can't remember / don't know

7) Do you feel the ambulance clinician(s) treated you with a sense of urgency?

- Yes                       No                       Can't remember / don't know

8) How would you rate the courtesy of the ambulance clinician(s)?

- Poor                       Fair                       Good                       Excellent                       Can't remember / don't know

9) Do you agree or disagree with the following statement? On this occasion, *I felt the ambulance clinician(s) had a good understanding of sickle cell anaemia*

- Agree                       Disagree                       Can't remember / don't know

**Do you have anything else you would like to tell us about the care you were given by the London Ambulance Service on this occasion? If so, please complete the box below.**

Thank you for taking the time to complete our questionnaire. Please return it to the LAS by Monday 27<sup>th</sup> June 2016 using the pre-paid envelope provided.

Return Address: Emily Cannon, London Ambulance Service NHS Trust, 8-20 Pocock Street, London, SE1 0BW

#### Appendix 4: Reasons for inappropriate overall pain management

Reason for overall inappropriate pain management	Frequency of patients (%)
No morphine administered	93 (63%)
More morphine should have been administered	18 (12%)
Patient could have been administered a non-opioid-based analgesia	15 (10%)
Morphine administered via a route outside guidelines	11 (8%)
Maximum dose of morphine administered but the patient's pain score was still high and the CHUB were not consulted	5 (3%)
Received Oramorph despite a high initial pain assessment and no attempt at IV morphine	4 (3%)
Despite a low pain score, stronger analgesia should have been considered as there was no reduction in pain score	1 (1%)
	<b>147</b>

*Table 8: Reasons for inappropriate overall pain management*

## Appendix 5: Additional patient questionnaire quotes

### Call triage

“My other had difficulty getting the call centre to send an ambulance, the call centre attendant asked more questions than necessary with the intention of not sending an ambulance crew”

### Conveyance to usual treatment centre

“Most ambulance clinicians need to stop arguing with patients on what hospital they want to go to”

“Hospital advised them to take me elsewhere”

“A lot of the time was spent arguing about which hospital to take me when I clearly had a letter written by my consultant to take me to my known hospital”

“They wanted to take me to hospital and I did not go as I had experienced quite a number of admissions in the previous year”

### Overall opinion of the LAS

“I would like to thank the LAS for always taking care of me. Nothing is ever too much. I really appreciate the service”

“On every occasion I have called the ambulance I feel that they don't take sickle cell as a serious illness. Most of the time they treat me like I am abusing the service”

“Everything was fine this time around but I had very bad experience resulting to previous services”

“The LAS care was adequate on this occasion”

“I am very grateful for all their help and encouragement, we want to say a big thank you”

“Thank you all very much 😊😊😊😊 so helpful!”

“Never had to complain and I'm grateful on how they have treated me”

“The ambulance people (paramedics) are very good to me. Especially helpful when I am in difficulty. I feel safe with them”

“On the two occasions I have needed an ambulance the service has been outstanding”