London Ambulance Service NHS Trust

A clinical audit to assess the use of Oramorph in the London Ambulance Service

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Clinical Audit & Research Unit

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Executive Summary

Background

Patients in severe pain usually receive morphine intravenously (IV); however, when IV access is not possible or suitable, Oramorph is an alternative solution. Similar to IV morphine, Oramorph can lead to side effects and patients should be re-assessed after administration. This clinical audit aimed to determine whether Paramedics within the LAS are administering Oramorph in line with guidelines and to assess whether Oramorph is successful in relieving pain.

Methodology

We reviewed 220 Patient Report Forms (PRFs) where Oramorph was administered during March 2015. The PRFs were reviewed for compliance to LAS protocol and UK Ambulance Services Clinical Practice Guidelines. One-hundred and fifty-nine PRFs were clinically reviewed to determine if patients were indicated to receive Oramorph, given their presentation and any possible contraindications.

Results

Administration Indicated
Of the 220 patients administered Oramorph, it was indicated on 79% of occasions (n=173). The most common reason Oramorph was not indicated was that another form of analgesia would have been more appropriate.

Pre-administration
99% of patients had their pain assessed prior to administration, with 80% being in severe pain (a pain score of seven or above). 82% of patients received all relevant observations with level of consciousness, respiratory rate, blood pressure, and medical history being documented for nearly all patients (100%; 99.5%; 99%; and 97% respectively). However, documentation of patients' current medication was the poorest at 83%.

Administration
All patients were administered Oramorph within the stated dose and via the correct route. Just over a third of PRFs had a drug pack code recorded.

Post-administration
After receiving Oramorph, 65% of patients had their pain re-assessed and 67% had all other relevant observations documented. Cardiovascular function, respiration rate and level of consciousness were documented for the majority of patients (72%; 71% and 70% respectively). However, a quarter of patients had no post-administration observations recorded at all.

Recommendations

1. Clinicians will be informed of the key clinical audit findings in a Clinical Update article, including the indications for Oramorph administration and necessity for post-administration observations. An infographic will also be distributed to all ambulance stations and shared on the Service's Listening into Action Facebook page.
2. CARU will share the findings with the Medicines Management Group.
3. CARU will determine whether the implemented actions have led to an improvement in post-Oramorph observations and documentation.

Background

To manage severe pain, Paramedics in the London Ambulance Service NHS Trust (LAS) are able to administer morphine directly in to a patient's vein (intravenously). Inevitably, there will be occasions when an alternative to intravenous (IV) morphine is required, for example, inability to access a vein, the patient refuses cannulation, or a less invasive form of analgesia is needed. An alternative option in such situations is to provide Oramorph, an oral form of morphine, which the patient swallows from an oral syringe. As with all forms of morphine, Oramorph can produce side effects including respiratory and cardiovascular depression (JRCALC, 2013).

There were three incidents between 2014 and 2016 where paediatric patients were administered double the indicated dose of Oramorph. Whilst it was not reported to have caused any harm to the patients, giving a higher dose than necessary does carry potential risks. The use of Oramorph by LAS clinicians has not previously been assessed and it is important to gain assurance that it is being used appropriately.

The recent LAS's Care Quality Commission (CQC) inspection report stated that there were "no systems, checks or regular audits in place to ensure medicines removed from paramedic or general drug packs had been administered to patients. This included oral morphine solution." (CQC, 2015). Following the CQC report, the LAS has focused on how clinicians manage and document drugs. This clinical audit will further contribute to the Service's work on medicine's management.

Aims & Objectives

This clinical audit aimed to:

- Determine whether LAS Paramedics are administering Oramorph in line with UK Ambulance Service Clinical Practice Guidelines 2013
- Assess whether Oramorph use is successful in relieving patients' pain

Methodology

Design

A retrospective snapshot clinical audit was undertaken, where Patient Report Forms (PRFs) were reviewed for the first 220 patients given Oramorph in March 2015. All PRFs where IV access wasn't attempted prior to Oramorph administration (n=134) were clinically reviewed by a Consultant Paramedic or Advanced Paramedic Practitioner to determine whether Oramorph was the most appropriate form of analgesia. A further 25 PRFs were also clinically reviewed where IV access was attempted to determine whether Oramorph was indicated given the patient's presentation and contraindications, or whether another analgesic would have been more suitable, such as paracetamol.

Audit standards

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

Aspect of care	Target	Exceptions*	Definitions
Administration indicated	100%	None	JRCALC (2013)
Pre-administration assessment			
Pain assessment recorded before administration	100%	Patient refused; patient unable to communicate	JRCALC (2013)
Relevant observations taken before administration: • Respiratory rate • Blood pressure • Level of consciousness • Medical history • Medication • Allergies	100%	Patient refused; patient unable to communicate	JRCALC (2013)
Administration			
Correct dose	100%	None	JRCALC (2013)
Correct route	100%	None	JRCALC (2013)
Drug pack code documented	100%	None	LAS (2014)
Post-administration assessment			
Pain assessment recorded after administration	100%	Patient refused; patient unable to communicate	JRCALC (2013)
Relevant observations taken after administration: • Respiratory rate • Cardiovascular function • Level of consciousness	100%	Patient refused; patient unable to communicate	JRCALC (2013)

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

Table 1: Clinical audit standards

Data analysis

Data were entered into a Statistical Package for the Social Sciences (SPSS) database and analysed using descriptive statistics. Due to rounding, percentages may not always equal 100.

Results

Patient Demographics

The majority of patients were female (59%. n=130), with a mean age of 49 (ranging from 2 to 94 years), as shown in Figure 1.

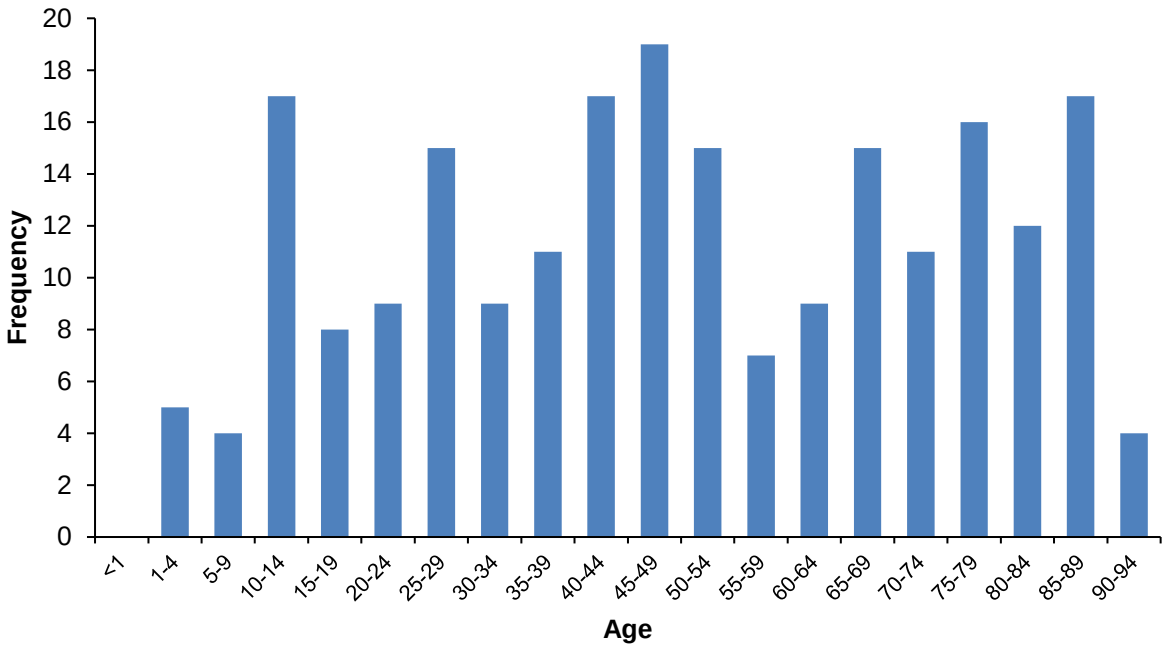

Figure 1: Age range of patients administered Oramorph

Nearly all patients (99%, n=218) were administered Oramorph to relieve pain, one of whom had a suspected myocardial infarction (MI) and failed IV access (clinically reviewed). For the two remaining patients it was not clear why Oramorph was given as there was no indication of pain on their PRFs.

Administration Indicated

Of the 220 patients in the sample given Oramorph, it was indicated on 79% of occasions (n=173). A large number of patients (71%, n=157) were also administered other forms of analgesia, most commonly Entonox (81%, n=128), followed by paracetamol (37%, n=58) and ibuprofen (15%, n=24).

Aspect of care	Exceptions	Sample	Compliant n (%)	Non-compliant n (%)
Administration indicated	0	220	173 (79%)	47 (21%)

Table 2: Compliance with clinical audit standards (administration indicated)
*Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%*

When Oramorph was appropriately given (n=173), most patients had IV access attempted prior to administration (n=75), followed by patients who reported severe pain (n=67). The administration to the patient with a suspected MI was deemed appropriate following clinical review as IV access had failed. Figure 2 provides further detail on appropriate and inappropriate administrations of Oramorph.

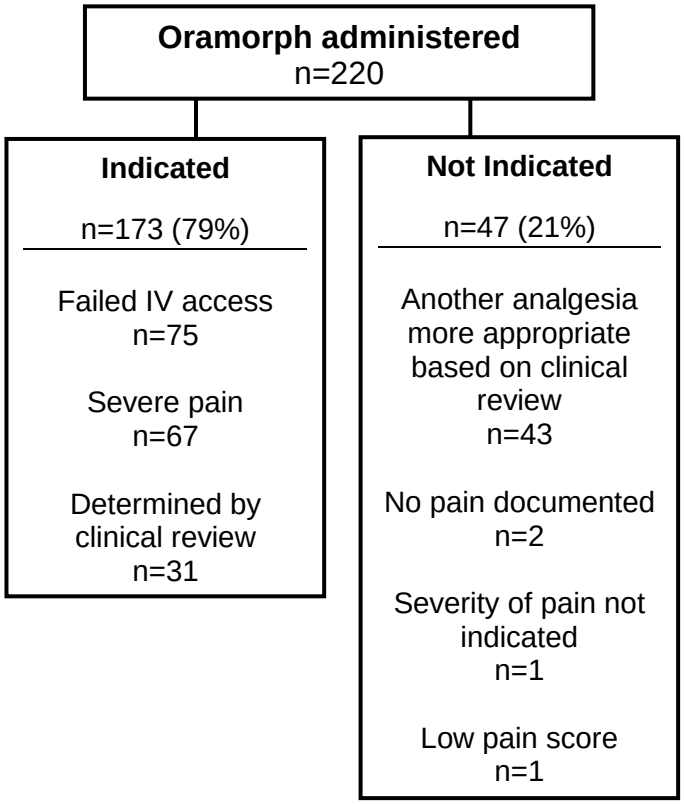

Figure 2: Appropriate and inappropriate administrations of Oramorph

Based on clinical review, another form of analgesia was deemed more appropriate for 43 patients who could have received:

- IV morphine or paracetamol (77%, n=33)
- Oral paracetamol or ibuprofen (14%, n=6)
- Subcutaneous morphine (9%, n=4)

Upon clinical review, it was noted that 47 patients given Oramorph would have benefitted from receiving additional analgesia: Entonox (91%, n=43), oral paracetamol (6%, n=3) and oral paracetamol or ibuprofen (2%, n=1).

Pre-administration Assessment

Aspect of care	Exceptions	Sample	Compliant n (%)	Non-compliant n (%)
Pain assessment recorded before administration	8	212	209 (99%)	3 (1%)
Relevant observations taken before administration	0	220	180 (82%)	40 (18%)

Table 3: Compliance with clinical audit standards (pre-administration assessment)
*Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%*

Pain Assessment
Where an initial pain assessment could be obtained before Oramorph administration (n=212), it was recorded for 99% of patients (n=209). The presenting complaints of the three patients who did not have an initial pain assessment were 'Fall', 'Finger Injury' and 'Chest/Leg Pain'. A pain assessment could not be sought for eight patients who were either unable to understand (n=5), refused a pain assessment (n=2) or were unable to communicate (n=1).

Most patients were in severe pain (80%, n=167/209), as shown in Figure 3.

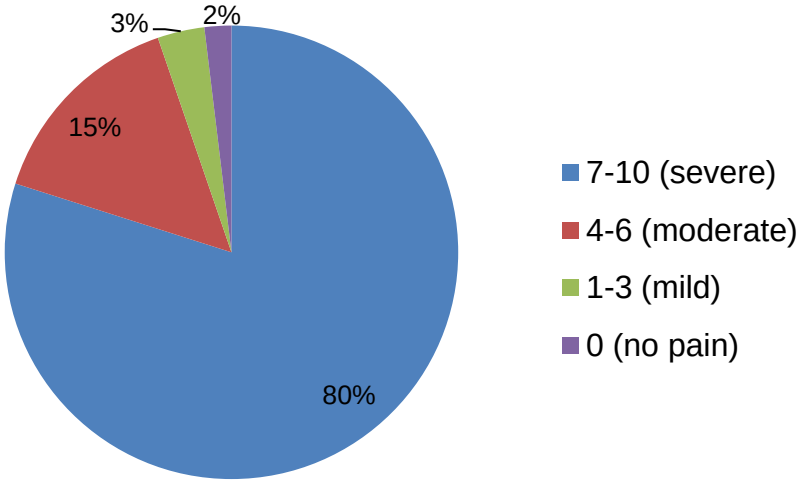

Figure 3: Initial pain score (severity) of patients administered Oramorph[i]

[i] Narrative pain assessments were matched to the corresponding numerical category

Relevant observations taken before administration

Eighty-two percent (n=180/220) of patients received all relevant observations prior to Oramorph administration.

All patients had their level of consciousness (LoC) assessed (100%, n=220) and nearly all had their respiratory rate (RR) documented (99.5%, n=219). The majority also had a blood pressure (BP) reading recorded, or relevant observations where a BP was not possible for paediatric patients (99%, n=218). The majority of patients had their medical history (Medical Hx) documented, to check for possible cautions when administering morphine (97%, n=214) and most had consideration of allergies documented (96%, n=211). However, patients' current medication was only documented for 83% of patients (n=183), as shown below in Figure 4.

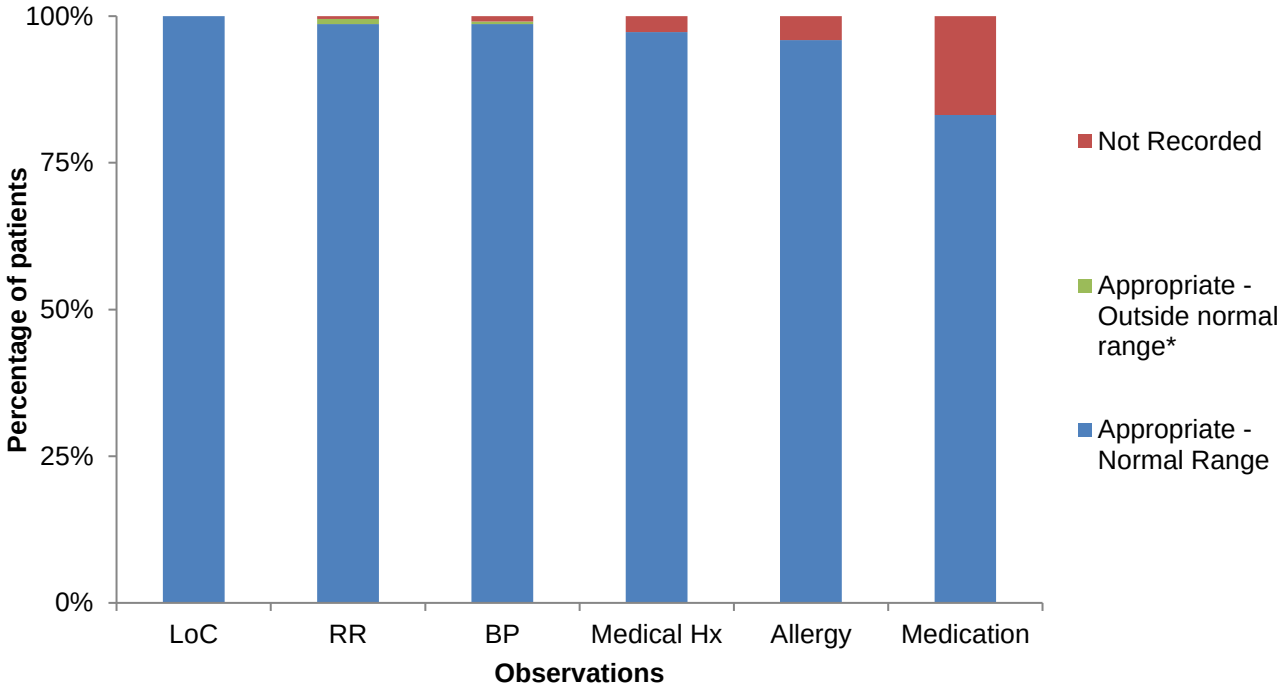

Figure 4: Observations before Oramorph administration

*Clinically reviewed

Oramorph Administration

Aspect of care	Exceptions	Relevant sample	Compliant n (%)	Non-compliant n (%)
Correct dose	0	220	220 (100%)	0 (0%)
Correct route	0	220	220 (100%)	0 (0%)
Drug pack code recorded	0	220	78 (35%)	142 (65%)

Table 4: Compliance with clinical audit standards (administration)
*Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%*

Correct dose
Paramedics administered Oramorph within the stated dose for all patients (100%, n=220), which is a maximum of 20mg for adults and smaller age-dependent doses for children. Ninety percent of patients (n=199) received 20mg of Oramorph in total, all of which were 12 years and over.

The most common initial dose given was 10mg (40%, n=88), followed by 20mg (24%, n=52) and 5mg (17%, n=38). It was noted that four Paramedics incorrectly used ‘ml’ (n=3) or ‘m’ (n=1) instead of ‘mg’ when recording the dose measurement.

Correct route
All patients (100%, n=220) received Oramorph orally.

Drug pack code
Only 35% (n=78) of PRFs had a drug pack code recorded, meaning it was not documented on the paperwork of 142 patients (65%).

Post-administration Assessment

Aspect of care	Exceptions	Sample	Compliant n (%)	Non-compliant n (%)
Pain assessment recorded after administration	7	213	138 (65%)	75 (35%)
Relevant observations taken after administration	0	220	147 (67%)	73 (33%)

Table 5: Compliance with clinical audit standards (post-administration assessment)
*Key **Red**: 0-74%, **Amber**: 75-94%, **Green**: 95-100%*

Pain assessment
Following the administration of Oramorph, 65% of eligible patients (n=138/213) had their pain re-assessed. There was no evidence of a second pain assessment for the remaining 35% (n=75). Seven patients could not provide a pain score as they were either unable to understand (n=5), refused an assessment (n=1) or were unable to communicate (n=1).

Overall, 67% of patients (n=93/138) reported a decrease in their pain; with a 33% decrease in patients reporting severe pain. A breakdown of the pain assessments post-administration are shown in Figure 5.

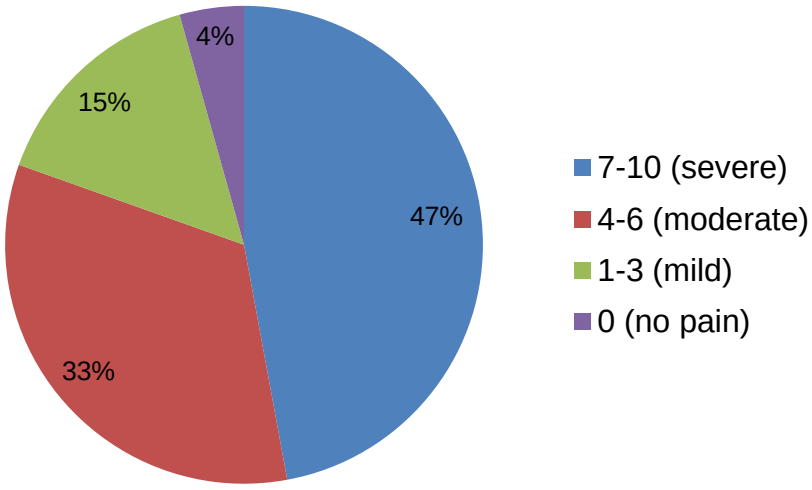

Figure 5: Final pain score of patients after Oramorph administration[ii]

[ii] Narrative pain assessments were matched to the corresponding numerical category

Relevant observations taken after administration

Over a quarter of patients (n=56) did not have their pain or vital signs re-assessed post-Oramorph administration.

Sixty-seven percent of patients (n=147) had all the necessary observations taken after Oramorph administration (cardiovascular function, respiration rate and level of consciousness). Seven percent of patients (n=16) had at least one relevant observation recorded; however, 26% (n=57) had none.

Just under three-quarters of patients (72%, n=159) had their cardiovascular function measured via the assessment of either their heart rate (HR) or BP. A respiration rate was recorded after Oramorph administration for 71% of patients (n=156). Level of consciousness was documented for 70% of patients (n=153), as shown in Figure 6.

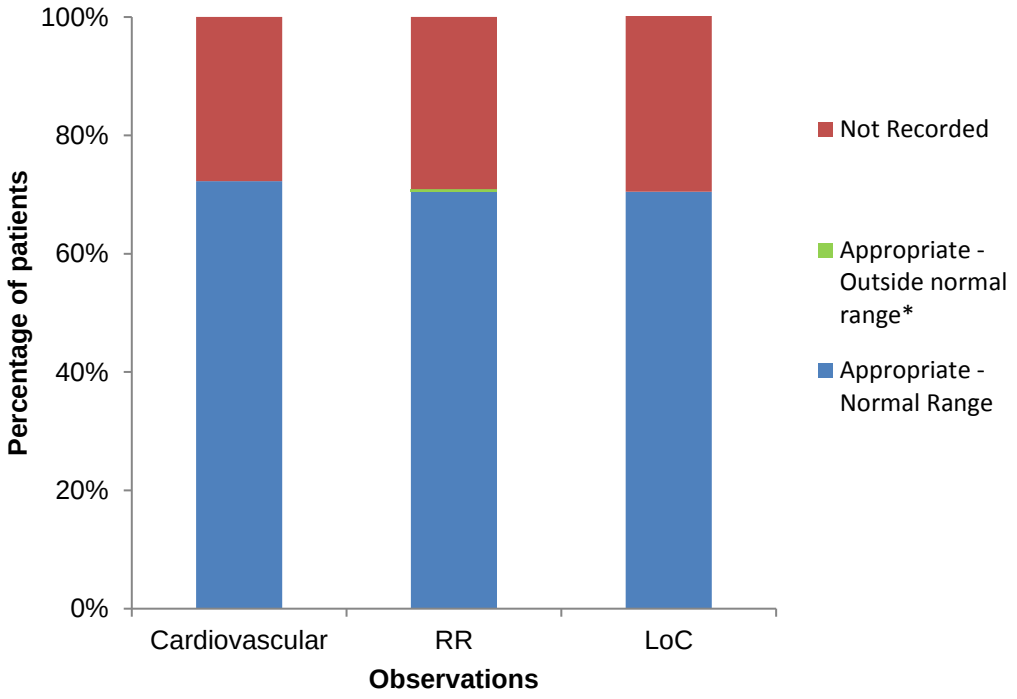

Figure 6: Observations after Oramorph administration

*Clinically reviewed

Discussion

This clinical audit demonstrates high compliance overall, particularly with pre-administration observations and the dose and route of Oramorph administration. However, there were instances where administration was not indicated and compliance was poor in recording post-administration pain assessments and observations, together with drug pack codes.

Oramorph was indicated for over three-quarters of patients, meaning another form of analgesia may have been more suitable for the remaining patients. In addition, for one-quarter of patients there was no evidence to suggest that their pain or vital signs were re-assessed after Oramorph administration. Recording post-administration observations is necessary as the effectiveness and any side effects of drugs administered to patients should be passed over during clinical handover at hospital (LAS, 2016$_a$). A Clinical Update article will be written to ensure crews are aware of the indications for Oramorph, together with the importance of reassessing patients' pain and vital signs post-analgesia administration. An infographic presenting the key findings of this clinical audit will also be disseminated as a poster to all ambulance stations and shared on the Service's Listening into Action Facebook page.

All patients received Oramorph orally within the maximum dose, but the correct unit of measurement and documentation of drug pack codes need attention. Just under two-thirds of PRFS did not have a drug pack code recorded, meaning it would be challenging to link the patient with a batch and manufacturer number in the event of a recall or adverse reaction to the drug (LAS, 2015$_a$; LAS, 2016$_b$). However, it should be acknowledged that this audit data is from March 2015 and since then the Service has done considerable work on medicines management and the importance of documenting drug pack codes (LAS, 2015$_a$). In order to contribute to the Service's recent work, this report will be shared with the Medicines Management Group.

Whilst it is encouraging to report that all clinicians gave the correct dose of Oramorph via the correct route and nearly all patients had their severity of pain assessed, further improvements are required. The recommendations of this clinical audit aim to improve clinicians' understanding of the indications for administration and the necessity for post-administration assessments. This, combined with the Service's recent work on medicines management, should see improvements when the use of Oramorph is re-audited once all actions have had sufficient time to take effect.

Recommendations and Actions

	Recommendation	Action	Responsible Officer	Director	Deadline
1	Frontline staff are informed of the key clinical audit findings including: • Indications for Oramorph • The importance of assessment post-administration	The Clinical Audit Officer will write a Clinical Update article	Clinical Audit Officer	Chief Quality Officer	March 2017
		The CARU Staff Engagement Officer will produce an infographic for the Listening into Action Facebook Page and facilitate discussions amongst frontline staff	CARU Staff Engagement Facilitator	Chief Quality Officer	February 2017
		CARU will print the infographic as a poster and share with ambulance stations	Clinical Audit Assistant		
2	Findings are shared with the Medicines Management Group	The Clinical Audit Officer will share this report with the Medicines Management Group	Clinical Audit Officer	Chief Quality Officer	January 2017
3	Determine whether the implemented actions have led to an improvement in post-Oramorph observations and documentation	CARU will re-audit the aspects of care in need of most improvement	Clinical Audit Manager	Chief Quality Officer	March 2020

Table 6: Recommendations and actions

References

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Joint Royal Colleges Ambulance Liaison Committee, 2013. UK Ambulance Services Clinical Practice Guidelines 2016. Bridgwater: Class Professional Publishing.

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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.

Description of staff activity	**Approximate Cost**
Project design	£166.17
Data collection	£315.04
Quality assurance	£23.57
Clinical review/advice	£222.62
Data analysis	£126.30
Report write up	£277.86
Feedback on report	£206.68
Report re-drafting	£246.29
Management Information	£48.26
Total	**£1,632.79**

Table 7: Cost analysis for this clinical audit project