

## East of England Ambulance Service NHS Trust

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Incident date: 29 September 2014  
Date of Final Report: 9 December 2014  
Investigating Manager: interim Duty Locality Officer  
Incident Type: Medication Incident  
Incident Level: Level 1 Concise Investigation

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## 1. Executive Summary

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At 17:33 on 29 September 2014, the East of England Ambulance Service NHS Trust received an emergency call through Norwich's Emergency Operations Centre (EOC) to attend to a 91 year old female patient who was complaining of chest pain. The call to the control room came via staff at the residential home where the patient was a resident and as this call was coded as a chest pain it was correctly triaged and graded as a life threatening call (RED2) with a response target of eight minutes. A Double Staffed Ambulance (DSA) consisting of two Paramedics was dispatched and arrived to this incident in thirteen minutes and 43 seconds, 5 minutes 43 seconds outside the timeframe standard.

During assessment of the patient, the Paramedics recorded that she was bradycardic with a heart rate of 46 beats per minute. In treating this patient's bradycardia, one of the Paramedics administered 500mcg Adrenaline 1:1000 intravenously instead of the intended 500mcg Atropine. On realisation of the error of the wrong drug being administered to the patient, the Paramedic called his Duty Locality Officer (DLO) for clinical advice and informed Addenbrookes Emergency Department staff of the error during his handover. The patient's heart rate had increased from 46 Beats Per Minute (BPM) to 80 BPM on leaving scene and no adverse signs or symptoms were recorded whilst the patient was conveyed to the receiving Hospital.

The patient was discharged from Addenbrookes hospital approximately two hours after admission. Upon enacting Duty Of Candour, the Investigating Officer spoke with the patient's daughter. She confirmed that she had suffered no ill effect as a result of being administered 1:1,000 adrenaline.

### **The investigation has identified the following lessons from this incident:**

- Although there is a process in place for checking drugs prior to administration, tiredness, fatigue and muscle memory can all contribute to the failure of this system. The responsibility for the incorrect administration rests with the Paramedic who failed to comprehend what he had read on the ampoule.
- Without dedicated time to undertake such tasks as drug bag restocking there is an increased risk of mistakes occurring.
- Access to drugs for restocking should be limited to members of staff that are competent in completing the task and access should not be given to alternate working duties staff as a matter of course unless they have had specific training on the correct procedures.

**The Investigating Officer has made the following recommendations:**

- Paramedic to ensure that all drugs are checked by crew mate and PCR signed prior to administration.
- Labels for syringes are made available on every station for all drugs carried in the drug bags in accordance with the Trusts Medicine Management policy.
- Access to drug stock should be limited to appropriate staff such as Duty Locality Officers and not be made readily available to all staff unless appropriately trained.
- There should be a clear audit trail as to who has sealed the bag indicating that it is stocked correctly and in date.
- It is recommended that a Duty Locality Officer in South Cambridgeshire takes ownership for the Medicines Management and drug bag restocking / resealing process as a portfolio. This has been actioned in the first week of December 2014 and a DLO has been appointed.
- Record books are reintroduced to drug bags to identify when a drug was put in or taken out from a bag and an accountable person assigned for quality assurance.

## *2. Main Report*

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### *2.1 Concise description of the incident*

At 17:33 on 29 September 2014, a 999 call was received by Norwich EOC from a career at a residential home for a 91 year old female who “hasn’t been feeling well all day, she’s not right, she’s saying she has a pain in her chest on the left side, she’s breathless when she moves”. This call was correctly coded as a ‘chest pain’ and graded as life-threatening therefore requiring the standard of an eight minute response time (RED2). A Double Staffed Ambulance (DSA) consisting of two Paramedics were passed the call at 17:33 and the crew were mobile to scene fifty two seconds thereafter. The DSA was dispatched from Cambridge Station. This DSA was then stood down at 17:35 as a closer DSA had been diverted off a lower acuity call coded a (Green 3 call with a target response time of 50 minutes or a 20 minute call back) and dispatched at 17:35. This DSA was then reassigned to their original call as a second call had been received and the response upgraded to a R2 call as this call had been recoded as life-threatening. The original DSA was reassigned to this original incident and arrived on scene at 17:47. The response time to this incident was thirteen minutes and 43 seconds from the receipt of the call. This response time was outside the timeframe standard. The reason given for this missed incident compliance was ‘Geographical’ by the EOC manager, there was no comments made by an operations manager as to the reason for this missed compliance.

Documented within the Patient Care Record (PCR) O/A (on arrival) – (no accurate time was submitted onto the PCR) the patients observations were as follows:

- pulse 46 BPM,
- blood pressure of 135/51,
- a capillary refill of over three seconds
- blood loss of 0 mls,
- a respiratory rate of 24,
- oxygen saturations of 89% (on room air)
- a capillary refill of under two seconds,
- alert with a GCS of 14,
- pale with dry skin,

At 18:00, the patient's observations were repeated and were as follows:

- pulse was 46 BPM,
- blood pressure of 144/51,
- a capillary refill of over two seconds,
- blood loss of 0 mls,
- a respiratory rate if 24
- oxygen saturations of 96% (on 100% oxygen)
- alert with a GCS of 14
- pale with dry skin,
- a temperature of 36.3,
- Blood glucoses reading of 9.1 mmol/l

On analysing the observations and reading the narrative within the PCR although the patient had a GCS of 14 it was recorded that she was “confused but no more than normal”. During discussions with the Paramedics involved, it became evident that this patient's GCS was usually 14 due to her dementia but at this time they both felt that she was more confused than normal as a possible result of her bradycardia and reduced perfusion.

Within the PCR the patient's primary complaint was recorded as “SOB (short of breath) / dizziness” with a time of onset of 15:00. The history was that the patient had been unwell all day and at 15:00 she felt dizzy and staff had reported that she was short of breath. Care staff at the residential home called the GP who told them to call 999. The carer that made the 999 call reported that the patient was ‘not right’ and told the call handler that she had “pain in her chest on the left side and she is breathless when she moves.” A set of observations were given to the call handler over the phone and were as follows:

- Blood pressure of 149/57
- Pulse of 46

- Oxygen levels of 86%

The patient's previous medical history was noted on the PCR as Angina, Dementia, Ischaemic Heart Disease, Chronic Kidney Disease stage 4 and glaucoma. No drug history was completed on the PCR and "See list" was input into this box.

When assessing the patient, the crew completed a full cardiovascular, respiratory and neurological assessment. The crew found it difficult ascertaining all of the facts and relevant due to the patient's dementia and the lack of information that was presented to them. This was not fully documented on the PCR but both Paramedics were able to demonstrate the assessment that they had undertaken. The Paramedics both then discussed extensively the benefit that atropine would provide to this patient and referenced this with Clinical Practice Guidelines. The indications for atropine were as follows:

- Heart rate dropping below 40 BPM (although not documented on PCR)
- The patient was compromised with reduced oxygen saturations and a prolonged capillary refill time (CRT).
- The patient was also showing signs of poor perfusion, dizziness and possibly new confusion.

After consulting Clinical Practice Guidelines further, the crew came to the conclusion that 500mcg Atropine administered Intravenously (IV) would be of benefit to this patient by increasing her heart rate and should lead to improved perfusion.

The patient was then transferred to the ambulance by stretcher. The patient was cannulated in order to administer the drug before they moved the patient to the ambulance. It was evident in both statements taken during the investigation that there was some difficulty in determining if the patient's confusion was acute or chronic which needed extensive time and questioning with the care staff on scene.

After further discussions surrounding the benefit to the patient from administering her atropine, the crew were certain that it would be of benefit and while one of the Paramedics was discussing further issues surrounding the patient's on-going care and medications with the carers outside the ambulance, the other Paramedic drew up what he believed was atropine and went onto administer 0.5ml from the syringe he believed was atropine as he intended to administer 500mcg IV. Once the drug was drawn up into the syringe, the Paramedic labelled it 'A' as there was no drug labelling stickers available for atropine. When his colleague returned to the ambulance following discussions with the care staff, both Paramedics then rechecked the ampoule that had just been given to the patient. After closer inspection it was noted that the Paramedic had in fact administered 500mcg adrenaline 1:1000 instead of the intended 500mcg atropine at 18:28.

Full multimodal monitoring was applied to the patient throughout their assessment and immediately after realising that the incorrect drug had been administered, all observations were rechecked and the patient closely observed. There was no adverse effect recorded on serial ECG traces.

A request was made by EOC for the availability of the local DLO as the crew wanted to speak to them in the first instance and admit to the mistake that they had made only several minutes after the error was identified.

The patient was then transported to Addenbrookes hospital under blue light (emergency) conditions and a pre-alert was given to A&E staff. The crew were met at Addenbrookes by their DLO who sought senior clinical advice in the first instance.

After extensive reflection post incident, and following a verbal debrief completed by the DLO, an email was sent to all South Cambridgeshire crews instructing them to open break the seal on all their drug bags and check that there were no further adrenaline ampoules next to the atropine to mitigate the risk. No inaccuracies were noted.

## *2.2 Background and context of incident*

The East of England Ambulance Trust was created on 1 July 2006 and covers the six counties which make up the East of England - Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk. The Trust provides a range of services, but is best known for the 999 Emergency Service.

Our diverse area is spread over about 7,500 square miles and contains a mix of rural, coastal and urban areas – from Watford to Wisbech and Cromer to Canvey Island.

Our services are tailored to meet the needs of each community's differing environmental and medical needs.

The Trust employs around 4,000 staff and 1,500 volunteers to deal with over 900,000 999 calls every year. In addition the Trust handles more than one million non-emergency patient journeys to and from routine hospital appointments.

The EOC is the communications centre for all emergency and urgent calls in the area, receiving all requests for ambulance responses and dealing with all communication with operational resources in that area. There are three EOCs in the Trust based in Norwich (Norfolk and Suffolk), Bedford (Bedfordshire, Cambridgeshire and Hertfordshire) and Chelmsford (Essex). Each HEOC has a call handling function where it accepts the 999 emergency calls, a dispatch function that sends the appropriate response to the calls

received and a clinical desk that provides clinical support via clinician based telephone triage.

In April 2011, changes in response codes were made to further identify the acuity of the call. This meant that clinically qualified advisors, based in the EOC, would be used to further assess the level of response required and advise on alternative care pathways should this be appropriate following initial triage. In addition they would be available to cover clinical issues that arose during the shift. In November 2011 the Trust introduced a new role to the EOC called Clinical Coordinators. Clinical Coordinators were tasked with ensuring that the most appropriate response was made available to ensure the most appropriate level of care dependant on patient need.

### *2.3 Terms of reference*

- Why was an incorrect drug administered?
- Review the system processes locally (the bag re-stocking and sealing process)
- Review the process in which the Paramedic used before administering the drug.
- Were there any pre-filled Atropine stocks available (both in the drug bag and the local pharmacy)
- Make contact with the family.

### *2.4 Investigation Lead and Team*

The investigation was led by [REDACTED] – Duty Locality Officer (interim) for the East of England Ambulance Service NHS Trust.

### *2.5 Scope of investigation*

This investigation covers a single patient care episode. This report covers the maladministration of medication to a patient from a Paramedic.

### *2.6 Investigation type, process and methods used*

This investigation is a level one concise investigation

-Information was gained from the Computer Aided Dispatch (CAD) system.

-The Patient Care Record and shift summary were reviewed.

-The drugs bag re-stocking process was observed and reviewed at Cambridge station. This process is not a Trust-wide process but one that has been adapted from Bedfordshire. Due to the on-going management restructure this was often completed by any staff working alternate duties.

-The Paramedic was interviewed who gave the wrong drug was asked for the indications for administering atropine and gave a clear outline of the process he follows before administering any drug.

-Continuous Professional Development (CPD) and reflective learning was reviewed for the Paramedic.

-The Medicines Management policy was considered along with Clinical Practice Guidelines and clinical updates.

-Stores orders for Cambridge station were reviewed and the main supplies store was contacted to ascertain if any prefilled syringes were available at the time.

## 2.7 Time Line Of Events

1733	999 call received in Norwich EOC
1733	DSA1 assigned to call
1735	DSA1 stood down from call and DSA2 assigned
1736	DSA2 stood down and DSA1 reassigned to call
1747	DSA1 booked on scene
1749	Crew with patient
1749*	Initial set of observations. *no time input on PCR – states “O/A” (on arrival)
1749	Crew started to take history from patient and clinically examine her
1750-1800	100% oxygen administered. *recorded as 1800 on PCR but crew confirmed that it was prior to this time.
1800	Second set of observations recorded
Approx 1810	IV access gained by Paramedic
Approx 1820	Patient removed to ambulance via stretcher trolley
1800-1825	On-going discussion around administering atropine for this patient between crew members.
1828	Paramedic outside of ambulance gaining further details from care staff and answering questions that they had about the patient's condition
1828	500mcg 1:1,000 Adrenaline administered IV instead of 500mcg atropine
1829	Second Paramedic back in ambulance and crew checked ampoule post administration for documentation
1829*	Crew requested availability of DLO *CAD details show this request received by EOC at 1824. ?timing error on scene for when drug was administered.
1830	Crew departed scene to Addenbrookes A&E. Full multimodal monitoring



	throughout. Pre-alert given to Addenbrookes A&E
1830	Third set of observations recorded.
1845	Crew arrived at Addenbrookes A&E
1845-1900*	Patient handed over to Addenbrookes A&E staff. Full details of mistake also relayed at this point. *no handover time recorded on PCR.
1907	Crew clear at Addenbrookes and returned to Cambridge station as passed end of their shift.
2201	DATIX submitted on Cambridge Station

### *2.8 Involvement of patient / relatives*

The Investigating Officer contacted the patient's daughter, who was recorded as next of kin on the PCR, via telephone on 5 November 2014. Duty of Candour was enacted and it became apparent that the patient had not suffered any detrimental effect from adrenaline being administered instead of atropine as she was discharged home "within a couple of hours" of arriving at Addenbrookes. The patient's daughter did not wish to be involved further with the investigation and did not wish to receive a copy of the final Serious Incident report. The patient's daughter had no other issues to raise about her mother's treatment from EEAST and described the Paramedics who attended her mother as brilliant.

### *2.9 Involvement and support of staff concerned*

The Paramedic contacted his Duty Locality Officer (DLO) as soon as he was aware of the mistake who met the crew at Addenbrookes A&E. Further support was offered immediately after the incident by the South Cambridgeshire DLO team. No restrictions were applied to the Paramedics practice during the investigation.

The South Cambridgeshire DLO team were contacted and asked to appoint a Welfare Officer for the staff involved.

The Paramedic involved was interviewed at length by the investigating officer and was given their contact details should he wish to ask any further questions.

### *2.10 Notable practice*

None noted.

### *2.11 Detection of incident*

Once clear from this incident, the Paramedic returned to their base station as the crew were passed the end of shift. The Paramedic submitted an internal incident report (DATIX) before leaving to travel home.

The incident was reviewed by the Serious Incident Panel on 2 October and confirmed and reported as a Serious incident on 8 October 2014.

## *2.12 Care and service delivery problems*

The following care and service delivery problems include:

### Service Delivery:

The response time was out of the standard RED2 response target by five minutes 43 seconds. No other Service Delivery Problems have been identified.

### Care Delivery

The wrong drug was administered to the patient as the drug was not checked properly prior to administration.

Although the Paramedic followed the correct procedure in administering medication, they did not comprehend what he had read due to muscle memory and reading what he had expected to see. The Paramedic used the following process prior to administration:

- Identified the need for medication
- Reviewed Clinical Practice Guidelines with colleague
- Opened drug bag and saw what he was expecting to see
- Read the name of the drug on the ampoule but did not comprehend that it said adrenaline and not atropine
- Checked that it was in date
- Checked for clarity of the fluid
- Drew up half the syringe as he was giving 500mcg
- Rechecked the Clinical Practice Guidelines
- Rechecked all monitoring
- Administered the drug

The drug was confirmed with his crew mate once he returned to the ambulance after the drug had been administered.

The drugs bag was incorrectly stocked:

Recent local changes to the drugs bag restocking process placed the IM drugs in the main drugs bag within a pouch clearly identified as “IM USE ONLY”. When the drug bag was

restocked, 1:1000 1mg of adrenaline, an intramuscular drug, was placed in the main part of the bag and not separated from the intravenous drugs. The local drugs bag restocking process is as follows:

- Crew sign out sealed drug bag at the start of their shift
- If unused and still sealed at the end of their shift the drugs bag is returned to the sealed cupboard and signed back in.
- If the seal has been broken and drugs have been administered during the shift by the crews, the drugs bag is signed back in and left on the floor in the drugs store for re-stocking.
- If a drug is administered then the following details are recorded on the following slip within the drug bag:

Date		C/S		Start/Finish Times	Drug Pack No.	
Crew Name 1				Crew Name 2		
Drug Name		CAD No.	Number of units used		Given by	Witness
Giving Set used		Y / N	XXXXXXXXXX		XXXXXXXXXX	XXXXXXXXXX

- All of the record slips for drug administration are then archived and stored on station.
- Drugs bag replenished and replenish form completed with the following information:

Restocked by	Initials:	Sign:	Date:
Resealed by	Initials:	Sign:	Date:
Discrepancies/Breakages	Drug	No. Units	Sign
First Drug due to go OOD		Expiry Date	

- The drugs bag is replenished with stock from the local drugs cupboard.
- The bag is then resealed and made available in the stocked bag cupboard.

On reviewing the drug bag restocking process on station, the 'restocked / resealed by' forms are no longer used and as such the Investigating Officer was unable to ascertain who had sealed the drugs bag as correct and when.

Drugs record books were reviewed and the Investigating Officer was unable to identify who or when someone had placed the ampoule of adrenaline into the drug bag. There was no

record of either adrenaline or atropine being signed out to the drug bag. This process was reviewed by one of the local DLO's to the area who was also unable to confirm how the drug had got into the bag. Inadequate record keeping and the lack of a consistent approach were highlighted.

Throughout September 2014, there were prefilled syringes of atropine available from the main supply store but not adrenaline 1:1000. The drug bag that was used for this incident had two prefilled syringes of adrenaline stored in the IM pouch and no prefilled syringes of atropine as the stock on Cambridge station at the time was all ampoules.

### *2.13 Contributory Factors*

Care delivery problems:

- Wrong Drug administered

#### **Patient factors**

The patient suffers with dementia and it was difficult for the crew to determine if condition was different from normal

#### **Individual factors**

The staff were tired and fatigued as the job was received near the end of their shift and their workload was high. The Paramedic that administered the wrong drug had 9.5 hours off between rostered shifts due to a planned rest day swap that finished at 21:00 the previous day, and then was back on duty at 06:30 on the date of the incident.

#### **Task factors**

- The name of the drug was read but not comprehended
- No dedicated time to restock drug bags as this is undertaken throughout the shift where possible

#### **Communication factors**

The correct drug was only confirmed with colleague post administration.

No clear instructions for the restocking process communicated to staff

#### **Team factors**

- Crewmate was outside of the ambulance talking to the care staff when the wrong drug was administered.
- DLO team in South Cambridgeshire is frequently changing due to on-going delays with the management restructure

#### **Training**

There is no training given to new / interim DLO's for restocking process.

#### **Equipment and resources**

- Drug bag was incorrectly stocked. IM drugs were in the main part of the drug bag and not separated as IM only in the IM pouch.

Pre filled syringes of atropine were available from the main supply store throughout September but they had not replaced the ampoules that were already in the drug bags

### **Working condition factors**

Time pressure involved in restocking drug bags as there is no dedicated time to achieve this task throughout the shift.

### **Organisational and strategic factors**

Lack of Trust wide drug bag restocking and auditing process.

## *2.14 Root Cause Analysis*

Although the Paramedic involved went through the correct procedure of checking a drug prior to administration he failed to comprehend what he had read, this was coupled by not ensuring his crew mate also checked the drug prior to administration. In following the safety aspects for drug administration set out in the Clinical Practice Guidelines, the Paramedic was able to demonstrate a clear understanding of the process but did not appreciate the importance of comprehending what was read. This evidenced a lack of following the process of which fatigue and tiredness played a key role in this lack of comprehension.

It also became evident that the drugs bag restocking and resealing process in South Cambridge did not allow for an appropriate level of accountability and lacked a robust approach to record keeping. The risk of the wrong administration would have been greatly reduced if the drug bag was stocked correctly and consistently following on from previous guidance that was issued.

## *2.15 Lessons learnt.*

- Although there is a process in place for checking drugs prior to administration, tiredness, fatigue and muscle memory can all contribute to the failure of this system. The responsibility for the incorrect administration rests with the Paramedic who failed to comprehend what he had read on the ampoule.
- The drug bag restocking and resealing process in South Cambridgeshire needs reviewing to ensure that the correct drugs are in the allotted pouch and that there is some accountability and audit trail for when drugs were entered into the drug bags.
- Without dedicated time to undertake such tasks as drug bag restocking there is an increased risk of mistakes occurring.
- Access to drugs for restocking should be limited to members of staff that are competent in completing the task and access should not be given to alternate working duties staff as a matter of course unless they have had specific training on what to do.

## 2.16 Recommendations

- Paramedic to ensure that all drugs are checked by crew mate and PCR signed prior to administration.
- Labels for syringes are made available on every station for all drugs carried in the drug bags in accordance with the Trusts Medicine Management policy.
- Access to drug stock should be limited to appropriate staff such as Duty Locality Officers and not be made readily available to all staff unless appropriately trained.
- There should be a clear audit trail as to who has sealed the bag indicating that it is stocked correctly and in date.
- It is recommended that a Duty Locality Officer in South Cambridgeshire takes ownership for the Medicines Management and drug bag restocking / resealing process as a portfolio. This has been actioned in the first week of December 2014 and a DLO has been appointed.
- Record books are reintroduced to drug bags to identify when a drug was put in or taken out from a bag and an accountable person assigned for quality assurance.

## 2.17 Arrangements for shared learning

This report will be shared with the Commissioners, Trust Board, Locality Directors and Senior Locality Managers to ensure dissemination and learning across the Trust.

## Glossary of Terms

EMT	Emergency Medical Technician – a rank within the ambulance similar to that of a paramedic but without the advanced skills such as intravenous drug therapies or advanced airway management
DSA	Double Staffed Ambulance – this is the conventional ambulance used to convey ill patients to places of definitive care. They are fitted with blue lights and marked accordingly. They will usually have on board two ambulance staff members.
RRV	Rapid Response Vehicle – the Trust uses specially equipped ambulance cars marked with blue lights to arrive at patients quickly. These will usually only have a single member of staff on.
EOC	Emergency Operations Control – the Trust's control room where 999 calls are answered and where our dispatch staff communicate with our vehicles.
DLO	Duty Locality Officer
CAD	Computer Aided Dispatch – a system by which the HEOC staff dispatch and log permanently details of incidents that the ambulance Trust attend.