

# Extending the QIP for CO Diagnosis in ED (EQIP-CODED)

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CO Research Conference 14<sup>th</sup> June 2023

# CO poisoning: the silent and invisible killer in emergency medicine?



**Liverpool University Hospitals**  
NHS Foundation Trust

- 4000 identified annual cases.
- Study looking at four large Emergency Departments (ED), found raised COHb levels in 4.3% patients with non-specific symptoms

## Barriers to recognition

- Non-specific toxidrome.
- Poor undergraduate education.
- Lack of quick, non-invasive testing availability.



# Aims

1. Ascertain how often Emergency Department (ED) healthcare professionals **consider** CO when assessing patients presenting with non-traumatic headache at University Hospital Aintree
2. To increase the consideration of CO exposure in these patients within the ED setting.

# Methods



Retrospectively analysed all patients presenting to Aintree ED over 1-month period (Sept 2019)



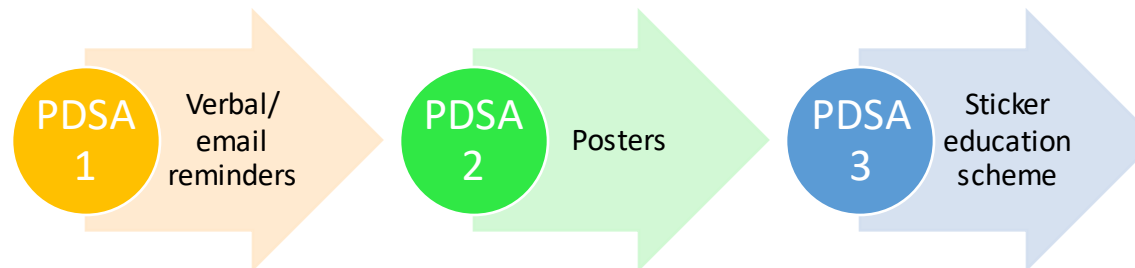
Only included patients presenting with non-traumatic headaches.



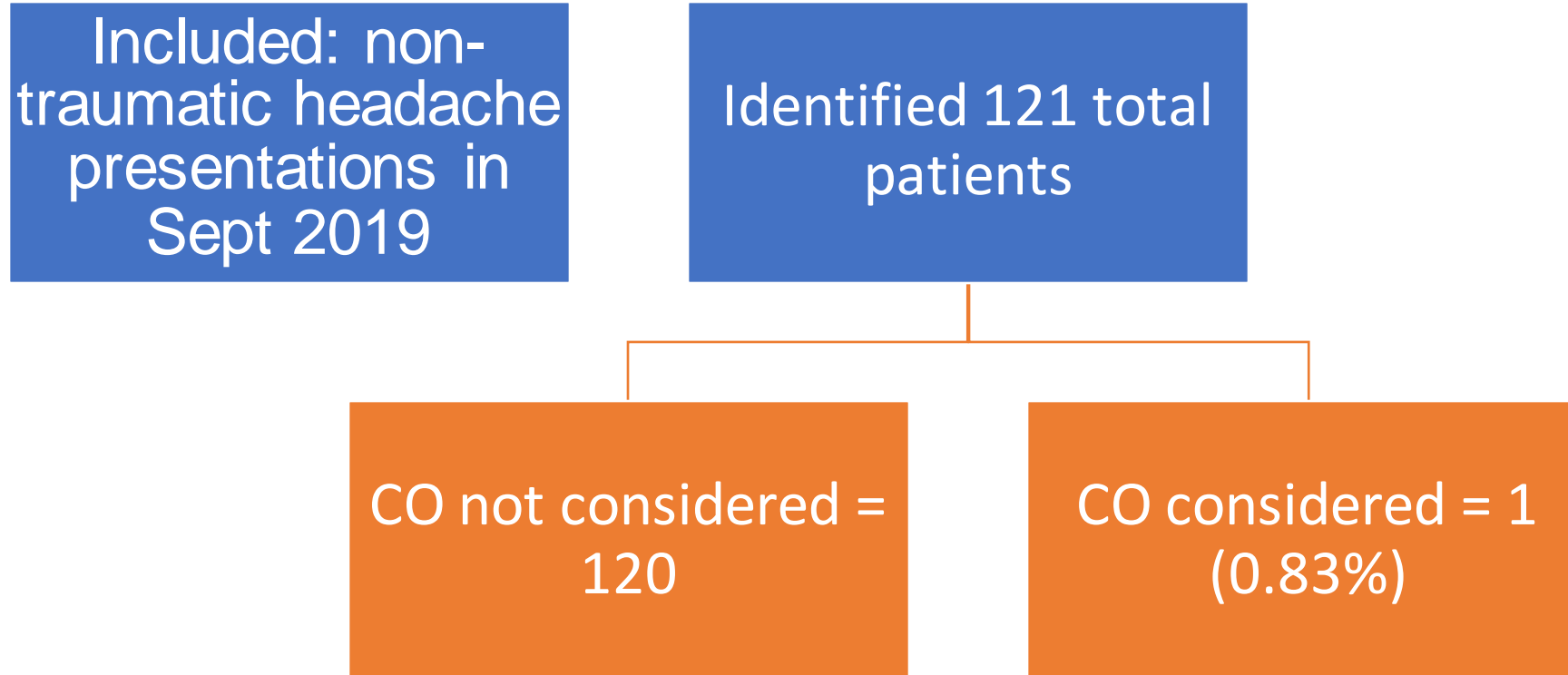
Reviewed online patient records for CO consideration evidence.



Implemented a Quality Improvement approach.



# Results – baseline audit



# Results from QIP cycles

## Cycle 1

Verbal and email reminders

### Could your patient have carbon monoxide (CO) poisoning?

**Common symptoms include:**  
Headache (commonest complaint)  
Drowsiness / tiredness / lethargy  
Flu-like symptoms / myalgia  
Nausea / vomiting  
GI upset (especially in children)  
Dizziness  
Confusion

**Higher level exposure will lead to:**  
Altered conscious level  
A comatose patient  
Focal neurology possible

**Commonest misdiagnoses:**  
Chronic fatigue / 'Tired all the time'  
Migraine or other cause of acute headache  
Labyrinthitis/ear infection  
'Stroke' / TIA  
'Collapse' / cause?  
A 'viral illness' / URTI

Carbon monoxide is produced from ANY carbon-containing fuel, so gas (mains or bottled), fuel oil (Heatercare), coal, charcoal, petrol, diesel, wood - even paper. Symptoms will be worse when inside the affected area and improve when outside. Any fuel burning appliance can discharge CO into the breathable atmosphere if incorrectly installed or not maintained properly.

**ASK the 'COMA' questions:**  
**C** for Cohabitees & companions - is anyone else in the house affected (including pets)?  
**O** for Outdoors - do your symptoms improve when out of the house?  
**M** for Maintenance - are any heating appliances properly maintained?  
**A** for Alarm - do you have a carbon monoxide alarm?

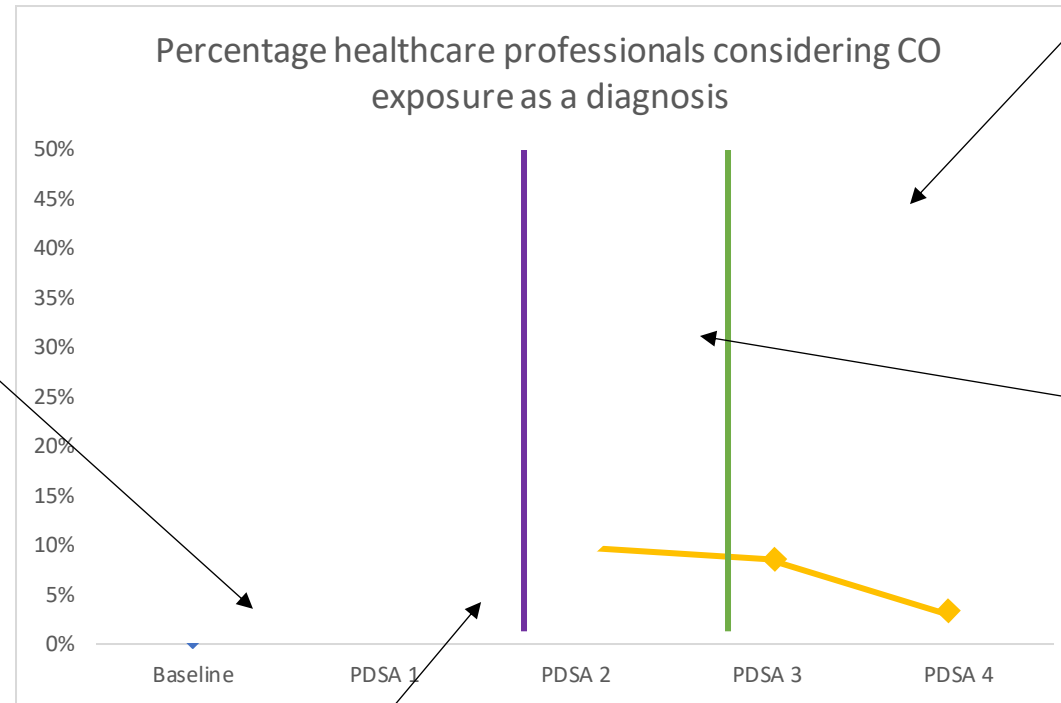
Patients who are misdiagnosed and sent home are at risk of continuing exposure, which may result in serious illness or death.

Carbon Monoxide (CO) remains the biggest cause of accidental death by poisoning in the UK

CO Awareness Week starts on the 3rd of Monday in November

www.COAction.org

## Cycle 2 Posters



## Cycle 4

Confirmation of a sustainable change

## Cycle 3

Sticker education scheme

### Non-traumatic headache? – Think COMA!

- ☐ **C** – do *cohabitees* have any symptoms?
- ☐ **O** – do symptoms improve when *outside*?
- ☐ **M** – any poorly *maintained* heating appliances?
- ☐ **A** – do you have a functioning CO *alarm*?

A '*no*' to any of the first 3, or '*yes*' to the 4<sup>th</sup> can rule out CO poisoning as a diagnosis.

# What does this mean?

- Carbon monoxide poisoning is an important differential in the ED.
  - Awareness of CO exposure is poor in ED settings.
  - Reasons for this are multifactorial.
  - Small changes can lead to significant change in CO awareness.

***Changes to practice are feasible and sustainable.***

# EQIP – CODED Aims

- To assess if these methods can produce a similar outcome across public hospitals in different regions of England and Wales.
- To establish if elements of the successful Quality Improvement Project undertaken at University Hospital Aintree (published in BMJ Open Quality in 2022) achieve similar success in other regional hospitals.
- Perform the same QIP at 4 more NHS trusts in a variety of hospital settings in England and Wales.



# Methods



Retrospectively analyse all patients presenting to Aintree ED over 1-month period



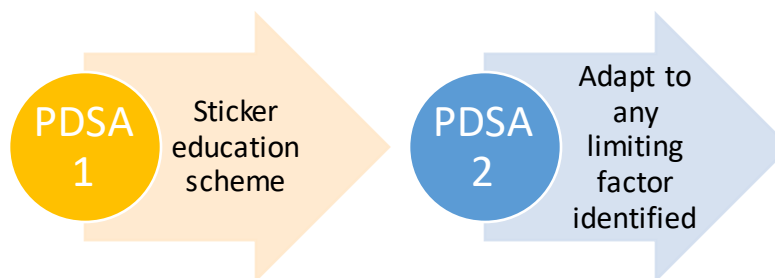
Include patients presenting with non-traumatic headaches.



Review online patient records for CO consideration evidence.



Implement a Quality Improvement approach.





Thank you  
*Any questions?*

