

# Quality Improvement Project (QIP): Improving recording of target oxygen saturation and prescribing on drug charts

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## Introduction

The majority of patients on our respiratory ward receive oxygen during their admission. There exist clear BTS guidelines which state that acutely unwell patients should attain oxygen saturations of >94% whilst those at risk of hypercapnic respiratory failure should receive restrictive oxygen aiming for saturations of 88%-92% (1). This difference requires consideration of the underlying condition and should prompt prescription to address this specific need. We have found that oxygen has not been prescribed, incorrectly prescribed or a target saturation range is lacking from the drug chart.

This is disadvantageous in two ways:

1. Hypoxia and hypercapnia may result from inappropriately prescribed and regulated oxygen leading to patient harm.
2. Patients inappropriately receiving oxygen may experience a prolonged hospital admission (as independence from oxygen is a key discharge criterion).

## Aims

We aimed to improve the recording of target oxygen saturation and correct prescription of oxygen on drug charts to 90% on Bluebell B Ward for a period 3 months.

## Methods

The **process measures** used during our quality improvement project were as follows:

1. Is oxygen prescribed on the drug chart? – See Figure 1.
  2. Are target saturations recorded on the drug chart?
  3. At post take ward round, are target saturations documented in the plan?
  4. At senior respiratory review are target saturations documented in the plan?
- Additional information gathered were the presenting diagnosis, past medical history of respiratory disease and whether an ABG was performed demonstrating hypercapnia.

**Our main outcome measure was:**

Do Oxygen Saturations on Nursing Observation Chart (see figure 2) match set Target Saturations on Drug Chart?

The **balancing measure** was continued adherence to 48 hour antibiotic review, the subject of a previous trust initiative and QIP.

Data was collected twice weekly by four trainee doctors during May 2017 to give seven data points. Data collection has continued once weekly since. Sources were the observation chart, drug prescription chart and the medical admission document. The QIP took place on a 30 bed respiratory and general medical ward.

Oxygen prescription	
Target saturation	If oxygen saturation drops below target range on prescribed oxygen, patient needs review by doctor. Remember criteria for calling emergency response teams include saturations less than 90% on greater than 28% oxygen.
94-98%	If oxygen saturation is above the target range on prescribed oxygen, reduce or remove oxygen; ask doctor to review / discontinue oxygen prescription the next time they see the patient.
Other (specify) %	Nursing staff – check and sign once per shift that patient is in target range.
Target saturation not applicable	
Continuous	
FOR HOME OXYGEN	
Date	16/6/17
Device	✓
% on Limit (e.g. 12L/min)	12
Sign and Reg No	24-28/6

SPO2	Plot as a graph AND write number	
	≥ 96	94-95
	92-93	92
	≤ 91	91 88
NOT ON OXYGEN		
	Oxygen Therapy L/min or %	+ 2L
	Mode (VM, NRM, NC, HumVM or Trache)	24 28
		NC ✓ ✓ ✓

Figure 1: The oxygen prescription area from a trust drug chart.

Figure 2: Oxygen saturation section of nursing observation chart

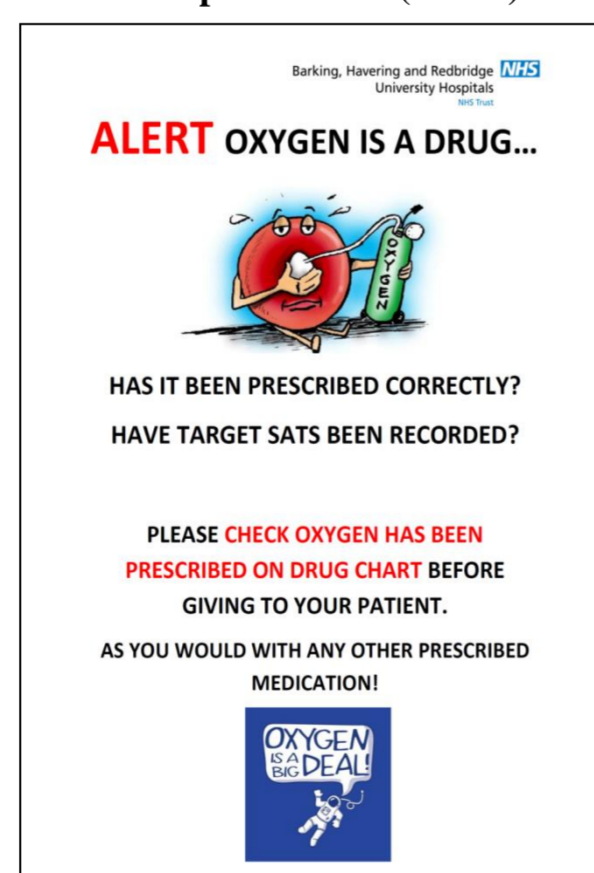
## Quality Improvement Methods

We used quality improvement methodology to institute interventions designed to increase awareness of the importance of accurate oxygen prescribing and administration (Figure 3). Following baseline measurement, three PDSA cycles took place with evaluation of each by subsequent data collection cycles.

The interventions were: an educational announcement at handover meeting, a visual prompt to remind prescribers of the QIP (Figure 4) and an email to the ward team highlighting performance statistics and areas for improvement.



Figure 4: Poster used as visual prompt for prescribers. (PDSA)



## Results

During this QIP, 7 cycles of data collection took place (15 measurements per cycle) giving a total of 105 patient measurements. Following this period, we continued to collect data on a once weekly basis to provide two additional points of data (30 patients).

### Oxygen Prescribing and Target Saturations on Drug Charts

Our first two baseline measurements showed only 46% of patients had an oxygen prescription on their drug chart (chart 1). This was seen to rise above 90% (93%) by measurement cycle 8 – following our PDSA interventions. A similar improvement is noted in the documenting of target oxygen saturations on the drug chart (chart 2). The parallel nature of these changes likely due to their shared area on the drug chart (figure 1). The timing of our PDSA interventions is shown on chart 1.

Chart 1 – Process Measure

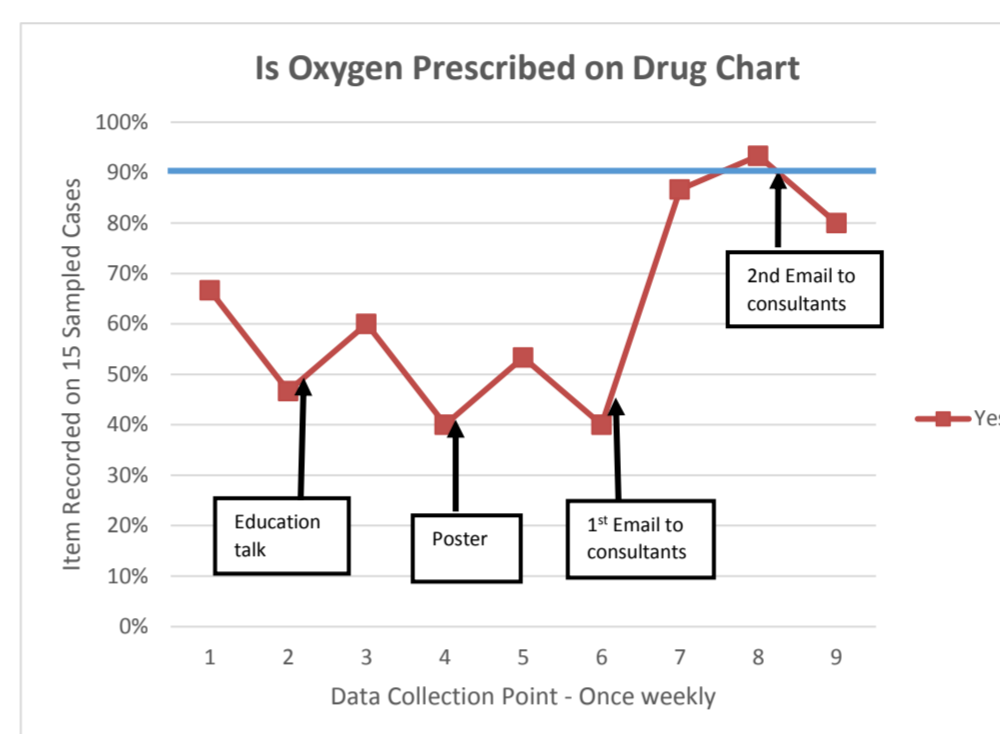
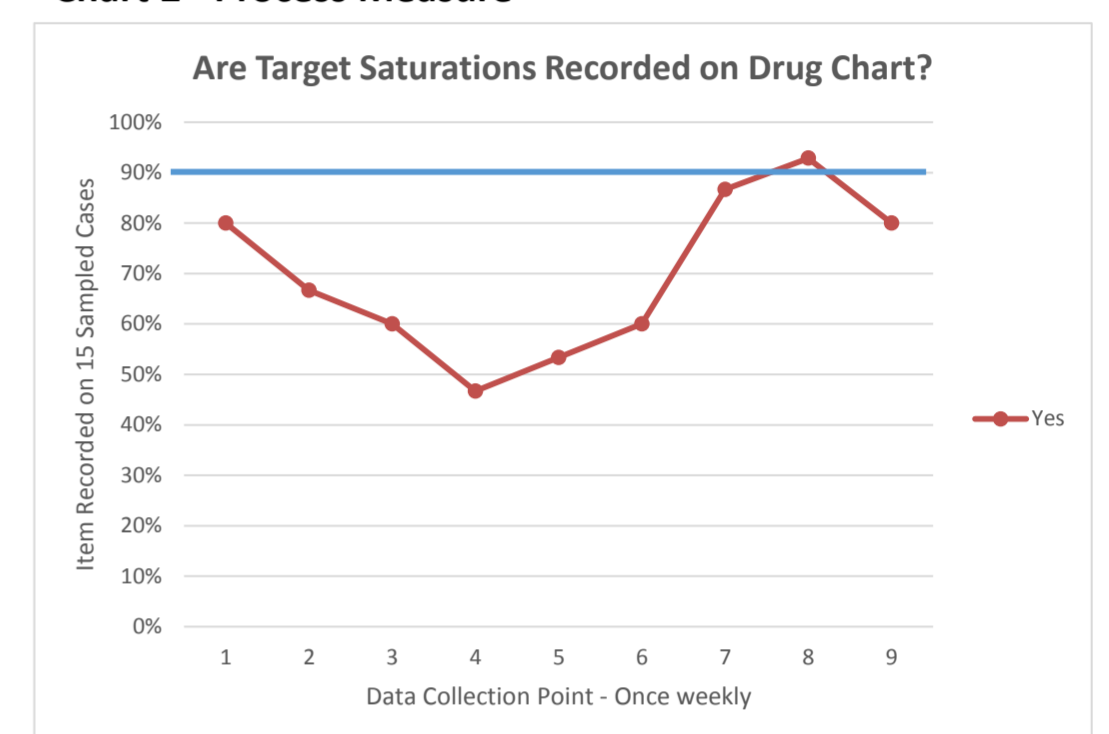


Chart 2 - Process Measure



Our main outcome measure - oxygen saturations on nursing observation chart matching the target saturation on drug chart improved to 80% from 53% initially (chart 3). Documentation of target saturations during consultant ward round remained low at around 20% throughout the project (chart 4).

Chart 3 - Main Outcome Measure

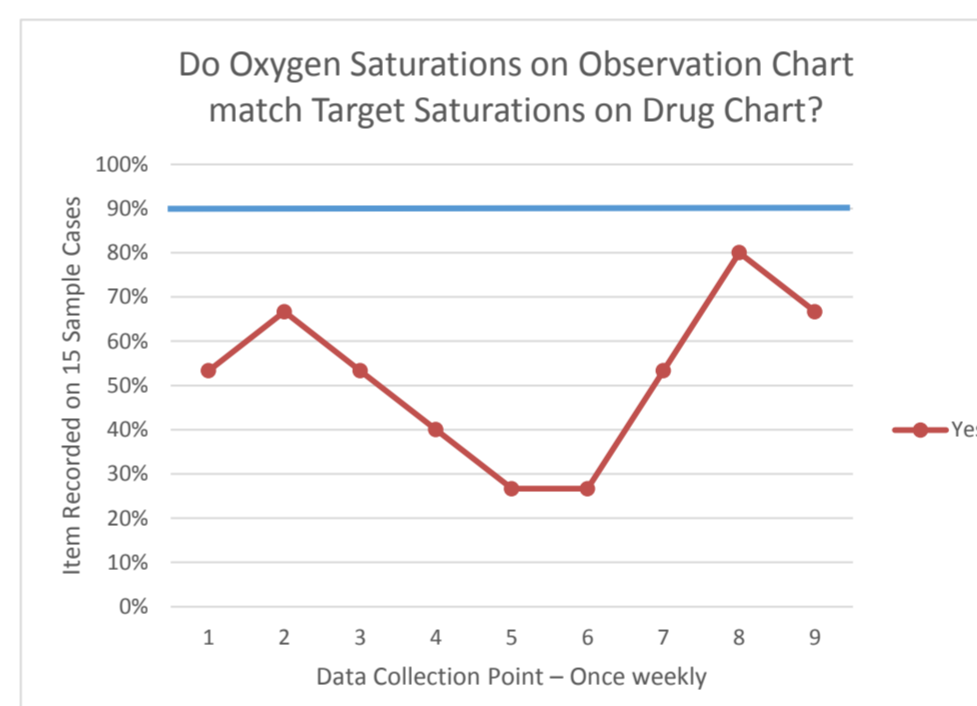
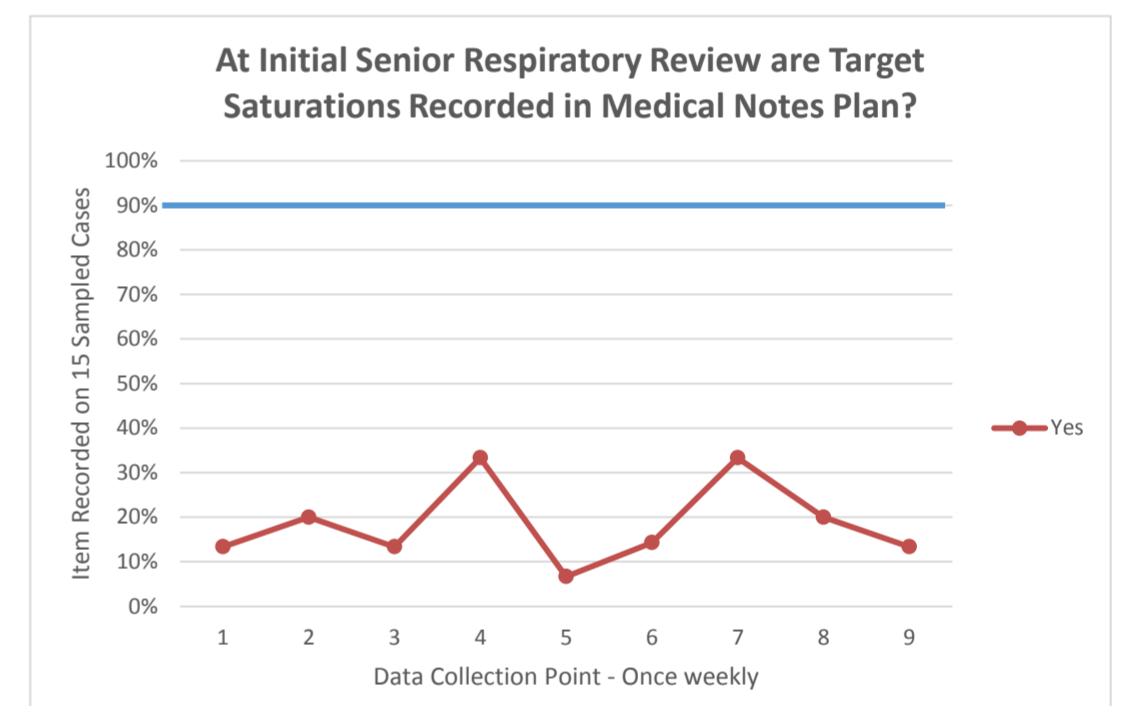


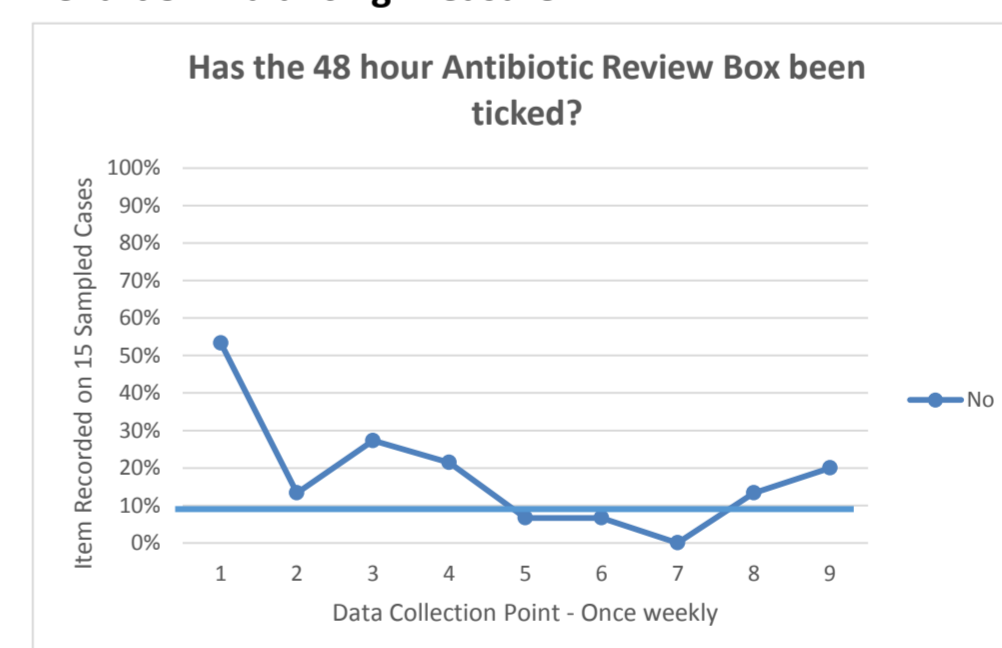
Chart 4 – Process Measure



### Balancing measures

Review of antibiotics at 48 hours improved throughout the project with less than 30% incomplete after baseline measures.

Chart 5 – Balancing Measure



## Conclusions

This QIP has shown improvement in of prescribing of oxygen and setting target saturations on our drug charts. Our PDSA interventions were easy to implement on the ward. Several areas were identified for further improvement. Although the oxygen saturations increasingly matched the prescribed range, we did not reach our 90% target. This may suggest an educational intervention is required – for example a workshop covering appropriate weaning of oxygen on respiratory wards.

Further interventions are planned to ensure that this improvement is sustained and does not rely on the efforts of the staff performing the project. Future PDSA's may focus on system change, such as pharmacists checking drug charts for compliance as part of their daily work routine. We noted consultant recording of oxygen target saturation rates in the medical notes was poor on both the ward and in the receiving unit, suggesting this would be another high-yield area for improvement.

### References

1. <https://www.brit-thoracic.org.uk/document-library/clinical-information/oxygen/emergency-oxygen-use-in-adult-patients-guideline/guideline-for-emergency-oxygen-use-in-adult-patients-executive-summary/>

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