



NRAP Good Practice Repository - COPD

Royal Albert Edward Infirmary (RAEI)
Wrightington Wigan and Leigh NHS Foundation Trust

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KPI:

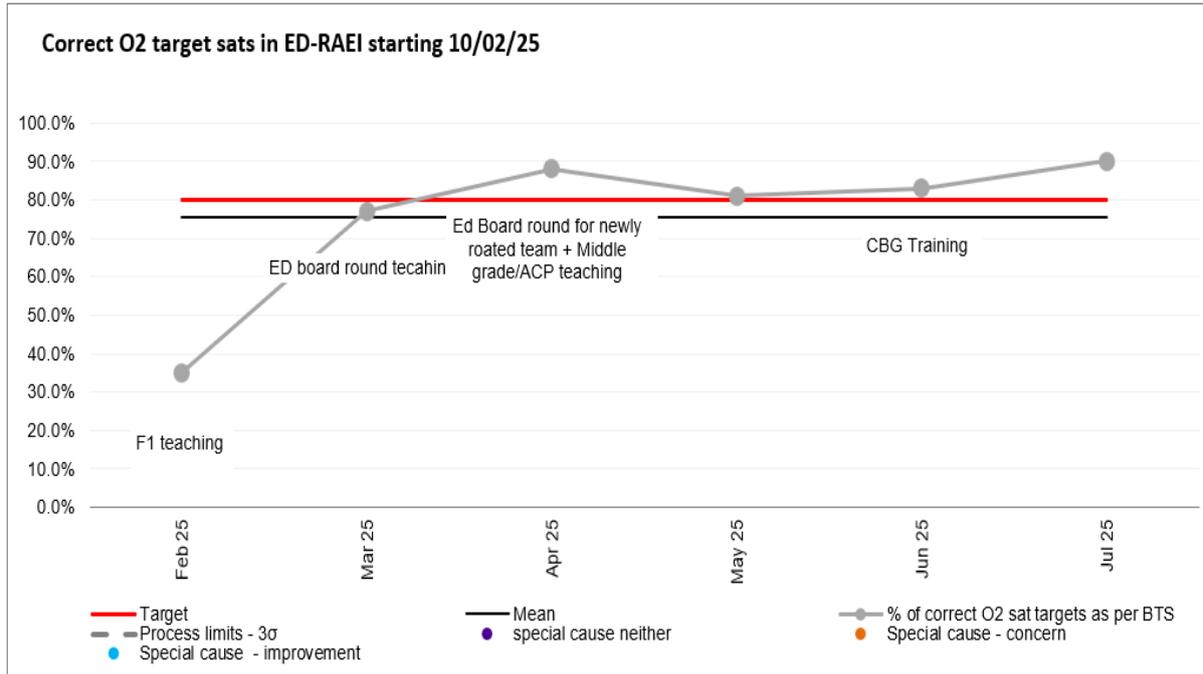
Improve accurate oxygen prescribing in > 80% of patients

Outline of your improvement project

Improving Oxygen prescribing in RAEI: A Quality Improvement Project

What has been achieved during this improvement project?

Overall, our project has demonstrated an improvement in correct O2 prescribing across the wards as well as a sustained improvement in correct target sats set in the emergency department, which have consistently achieved rates of above 80%.



How did you achieve this improvement?

4 PDSA cycles were carried out with a focus on teaching different groups of the MDT team, as well as some practical sessions which included CBG teaching. We have included a summary of each PDSA cycle below:

PDSA cycle 1 (13/01/25 – 11/02/25)

For the first cycle, Winstanley ward (respiratory) Lowton ward (acute medical), Ince ward (cardiorespiratory/geriatric medicine), were audited to collect baseline data for oxygen prescribing within the hospital. All three wards failed to meet the > 80% target.

The subsequent intervention from this initial data was to deliver a teaching session to the foundation year 1 doctors (FY1s) discussing a case with an oxygen prescribing error. The session to the FY1s was used to highlight the QIP and explain the BTS guidelines and recommendations for oxygen prescribing.

Following the case presentation, only the emergency department was audited to assess the impact of this cycle's intervention due to the initial data we collected from the wards showing us that target saturations were being set here. This was decided in a meeting between ourselves where we discussed the data and realised this trend. This also formed the basis of the rest of our research with the hypothesis that correcting oxygen target setting in the emergency department would have a trickle down affect on the wards.

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PDSA cycle 2 (27/02/25 – 10/03/25)

For the second PDSA cycle, the QIP team delivered a teaching session to the emergency department doctors during their daily board round. The session entailed an introduction to the ongoing QIP, explanations about the BTS guidelines and recommendations for oxygen prescription. Only the emergency department was audited to study any change in oxygen prescribing trends in this cycle.

From a learning perspective, it was noted that there was a considerable improvement in correct oxygen target setting which showed us our interventions were working. To go further we arranged further teaching sessions including a teaching session with more senior ED staff. We also began to explore how to establish a more permanent intervention.

PDSA cycle 3 (10/04/25 – 04/06/25)

During the third PDSA cycle, the QIP team delivered a teaching session specifically to the emergency department's middle grade doctors, and nursing staff during a formal departmental teaching day. During this session, the original case used during the FY teaching, involving an oxygen prescribing error, was discussed and an explanation was given about the BTS guidelines recommendations for setting appropriate oxygen target saturations. There was also open discussion held during the teaching session between the team and the emergency department healthcare workers to receive feedback on what obstacles there were to correctly setting oxygen saturation target ranges and their suggestions for how the system in place for oxygen prescribing could be improved. Additionally, a further teaching session was delivered at the emergency department's board round.

Following on from the two teaching sessions, the team audited Winstanley, Lowton ward, the acute stroke unit, Langtree (surgical ward), Lowton (acute medical ward), Medical assessment unit, Aspull (orthopaedic/geriatric ward), and the emergency department. These wards were audited to assess whether the emergency department focused interventions had led to an improvement in the other hospital departments. We found 4/6 wards audited met the >80 percent target set. This proved our hypothesis mentioned above.

From this third cycle, we were able to establish a more permanent solution through ACPs being made oxygen prescribing champions. We also learnt that changes had been made to nursing scope of practice meaning that it now included capillary blood gas training. Due to this we were able to commence training on this as well as taking into consideration feedback from teaching sessions which included also training staff other than nurses.

PDSA cycle 4 (24/06/25 – 16/08/25)

In the final PDSA cycle, the QIP team and the advanced respiratory nurse practitioner delivered a series of 7 training sessions on how to collect capillary blood glucose (CBG) samples. A total of 42

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healthcare professionals from the emergency department were trained to collect CBG samples and signed off on this procedure. These healthcare professionals included doctors, nurses, ACPs, ANPs, nurses and HCAs. Following this intervention only the emergency department was audited.

How are you going to ensure your intervention is going to lead to sustainable improvement in future?

To ensure that the change is sustained, we have had discussions with members of the MDT such as ACPs and nurses who have a more permanent position in the trust and are not rotating.

The ACP's in the ED have agreed to become Oxygen prescribing champions who will engage with the Respiratory ACP (Claire Holden) with regards to sustaining the improvements we have seen.

Claire (Respiratory ACP) has also been giving CBG teaching sessions continuously as well as the ED teaching lead to help push the usage of CBG as well as teaching about correct oxygen prescribing to all members of the MDT.

Did you face any challenges or difficulties when implementing your project? If so, how did you overcome them?

One of the difficulties we faced during the QIP was changing the Hospital inpatient system (HIS). Currently the HIS system has saturations of 96-100 and 88-92% as the only 2 possible oxygen saturation targets and which is linked to the NEWS scoring system. Additionally, HIS does not allow manual changing of the target saturations in different circumstances such as for patients with chronic lung disease with chronic type 2 respiratory failure who are oxygen sensitive. We attempted to change this by contacting the relevant teams, but we were informed that these changes could not be implemented. To overcome this, we focused more on education and implementing clinical practice interventions by delivering teaching sessions, highlighting the limitations of VBGs, and encouraging the use of CBGs for setting more appropriate oxygen target saturation ranges. Teaching sessions would also include explanations and discussions about BTS oxygen prescribing guidance.

Another challenge was the relatively small sample sizes we obtained during audits. On some days, the emergency department would only have a sample size of 2 to 3 as this was dependent on the number of patients requiring oxygen in the department. We addressed this issue by auditing over multiple days, to increase our patient sample size. However, we acknowledge that this limitation makes it more difficult to draw conclusions.

Finally, long term sustainability has not yet been assessed however this could possibly be assessed in future years to ensure sustained impact and this has been mentioned in our recommendations.

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Although we achieved and sustained improvements throughout the project, we have not yet been able to assess whether these improvements will persist in the long term. To address this, we recommend that future audits be undertaken periodically to ensure oxygen is being correctly prescribed across the hospital. Additionally, we believe that ongoing teaching sessions should remain part of departmental education. By making the principles of the project part of regular training and by appointing oxygen champions, we hope to ensure continued adherence to correct oxygen prescribing practice.

What advice would you give to other respiratory services hoping to replicate your service improvement idea?

Our main advice is to focus interventions where oxygen prescribing errors are initiated, rather than where they're first noticed. In our case, although the issue of incorrect oxygen target saturations was identified across multiple wards, our data showed that most errors were made at the point of admission in the Emergency Department. Redirecting our efforts there had a clear positive ripple effect throughout the hospital.

We would also recommend the following:

Adopting PDSA cycles allowed us to respond quickly to trends in our data, adapt interventions accordingly, and keep the project going over several months.

Understanding that a multi-disciplinary approach to implementing change is key as we found that nurses, ACPs, and other members of the ED team made our interventions more practical and sustainable. Therefore, we designated ACPs as oxygen prescribing champions also helped embed changes in day-to-day practice.

Educate early and often: Regular, focused, and concise teaching sessions at departmental board rounds in the ED were highly effective in raising awareness. Repeating sessions for different staff grades and roles ensured broader engagement.

Address practical barriers: One common issue that we faced was the reliance on VBGs to determine target oxygen saturation ranges due to ease of access. Training staff in capillary blood gas (CBG) sampling improved access to appropriate blood gas testing without the risks and discomfort associated with arterial sampling.

Have you generated any supporting resources you would like to share with others?

We have created multiple presentations to support HCP's during teaching sessions:

- Oxygen Prescribing Guidelines presentation, involving a case discussion
- QIP awareness presentation for ED board rounds
- Capillary Blood Gas training presentation

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Have you found any other similar projects you were able to learn from?

Samman Rose, Sundus Sardar, Sreethish Sasi, Dabia Hamad S H Al Mohanadi, Ahmed Ali A A Al-Mohammed, Muhammad Zahid - Time for change in practice of in-patient oxygen therapy: a period-limited, multidimensional approach to improve oxygen prescription compliance: quality improvement project at Hamad General Hospital, Qatar: BMJ Open Quality 2021;10:e001574.

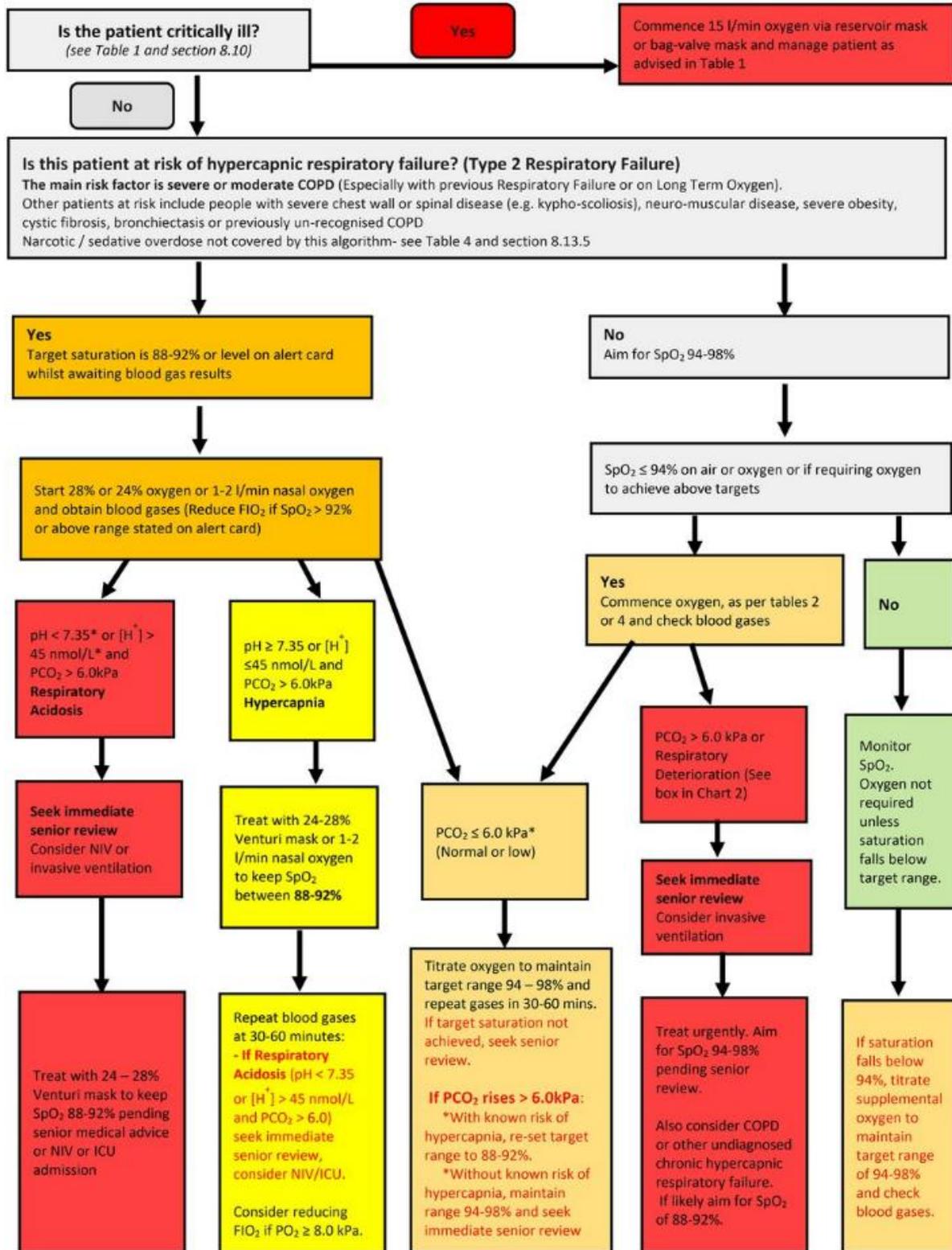
Onn Shaun Thein, Cathleen Man Ting Chan, Eleanor McCance, Maria Mullins, Davinder Dosanjh - Oxygen prescription: improving compliance using methods from BMJ Open Quality journal: BMJ Open Quality 2018;7:e000288.

It is important that services NRAP promotes within the good practice repository are aware of quality standards in their area of practice. Which quality standards are relevant to your QIP, and how did your project fit within the quality standards in general?

(for example, British Thoracic Society and NICE guidance)

BTS was the main guidelines we adhered to.

We used the BTS oxygen flowchart as our main resource to follow as well as emphasising its importance during teaching sessions.



Healthcare improvement driver diagram:

