

Optimizing Oxygen Therapy at HCA Florida Osceola Hospital: Is More Better? – A Quality Improvement Project

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Background

- Since the advent of oxygen therapy in healthcare, it has remained one of the most important and often used drugs.
- A “more is better” culture regarding oxygen use persists among healthcare providers and hospitals despite proven risks of excessive oxygen therapy use.
- Hyperoxia-induced hypercapnia among COPD patients is a well-studied phenomenon leading to respiratory acidosis, increased mortality, morbidity, and length of stay.
- Directed oxygen treatment guidelines have been implemented by the British Thoracic Society, who recommend that patients at risk of hypercapnic respiratory failure receive oxygen with a saturation goal of 88%-92%.

Objective

- The goal of our Quality Improvement (QI) project is to minimize the use of supplemental oxygen without proper indication, thus reducing the risk of patient harm incurred by providing excess oxygen, especially in patients at risk of hypercapnic respiratory failure.

Methods

Fig. 1 Root cause analysis

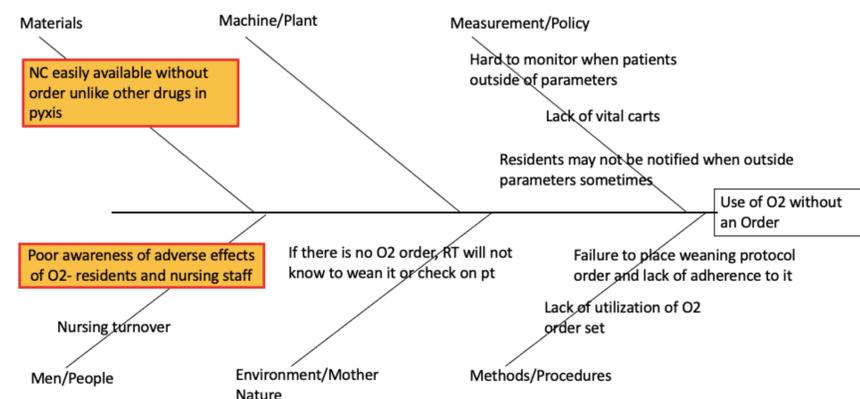


Fig. 2 Process map

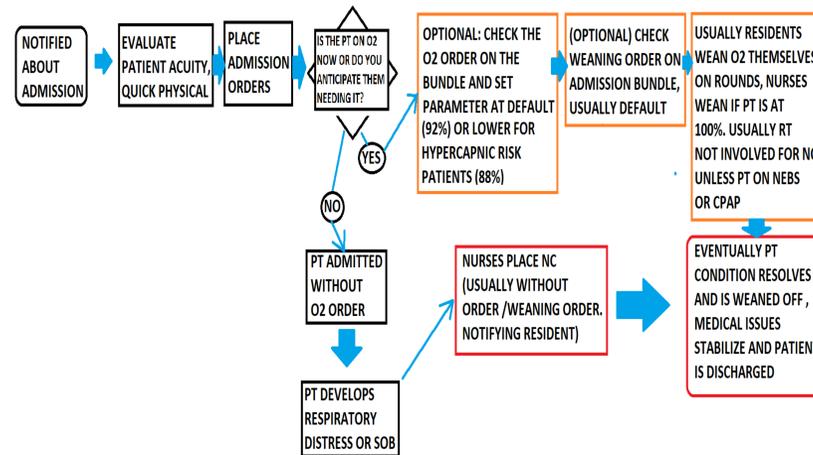


Fig. 3 Proposed intervention

Door Placards



Discussion

- We reviewed patients receiving oxygen therapy via nasal cannula on Graduate Medical Education (GME) teams, determined whether there was an appropriate order for oxygen, whether goal saturation parameters were listed, and identified patients at high risk for oxygen-induced harm, such as those with COPD. We excluded patients with active COVID-19 infection.
- In addition, we surveyed residents and nurses to assess their awareness of the oxygen order set and oxygen parameters.

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- Interventions included implementation of an oxygen order set in the electronic medical record (EMR), resident and nurse training, and door signs with goal oxygen parameters.
- The proportion of the patients on nasal cannula oxygen with a proper oxygen order increased from 28% to 55% after combining a new oxygen and weaning oxygen order in the admission order set.
- Despite this intervention, follow up resident surveys revealed that 44% of residents were still not aware of the oxygen order set and almost 99% of patients with COPD did not have desired oxygen parameters listed.
- Post-intervention nursing surveys also revealed that just over 50% of the nurses were aware of an oxygen order set, had witnessed patients outside the indicated parameters, and had placed patients on oxygen without an order.
- Currently, we are working on nursing education and putting signs on patients' doors that represent their appropriate goal oxygen parameters.

Conclusion

- Our QI project employed a multi-disciplinary approach to reduce the excess use of oxygen. Through prior EMR changes, and now provider education and door signs with goal oxygen parameters measures, we hope to see a significant increase in proper ordering of oxygen and use of oxygen within goal parameters.

References

- Cameron et al. "The risk of serious adverse outcomes associated with hypoxaemia and hyperoxaemia in acute exacerbations of COPD" *Postgrad Med J* 2012;88:684–689.
- O'Driscoll BR, Earis J, Howard LS, Mak V, on behalf of the British Thoracic Society. BTS guideline for emergency oxygen use in adult patients. *Thorax* 201