Improving Inpatient Care of COPD Exacerbations: Targeting Appropriate Oxygen Supplementation

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Background
Chronic lower respiratory diseases which include COPD and asthma, were the third leading cause of death in the United States in 2015 second only to heart disease and cancer.1 According to the Healthcare Cost and Utilization Project, there were 644,744 total primary hospitalizations for COPD and bronchiectasis in the United States in 2013 which was the 8th most common reason for an inpatient stay.2 Guideline based treatment of a COPD exacerbation includes but is not limited to the administration of steroids, bronchodilators, appropriate oxygen supplementation, and/or mechanical ventilation as indicated. A chart review was performed of patients treated for COPD exacerbations by internal medicine housestaff teams on the Menino campus in July 2016 at Boston Medical Center to identify potential targets for improving adherence to evidence based guidelines for COPD exacerbation management. Analysis of this chart review revealed that while 11 of 19 patients (58%) treated for an acute COPD exacerbation received nasal cannula supplementation, only 3 of those 13 patients (23%) had a formal order for nasal cannula supplementation. Of this group, only 2 of 3 patients (66.6%) had a titration goal and 0 of those 3 patients (0%) had the correct titration goal.

According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD) Report, updated in 2016, supplemental oxygen should be titrated to improve a patient’s hypoxemia with a target saturation of 88 – 92%. In patients with COPD exacerbations, there is an association of excess oxygen supplementation with hypercapnia, acidosis, and increased mortality.3 A cluster randomized controlled parallel trial performed in Australia in the prehospital setting showed reduced mortality by 78% in patients with COPD exacerbations who received titrated oxygen treatment when compared to high flow oxygen treatment.4 Based on this information, the goal of this project is to improve practices surrounding oxygen administration to patients with a COPD exacerbation.

Goal
The goal of this project was to collect and analyze data to identify targets for improvement in the management of COPD exacerbations. In addition, the project tries to improve practices surrounding oxygen administration to patients with a COPD exacerbation.

Methods
A project charter was created based on the July 2016 chart review which identified areas of non-adherence to evidence-based management of COPD exacerbations.

A cause-and-effect diagram was created to identify areas for improvement in the delivery of appropriate oxygen supplementation to patients with COPD exacerbations. A paper order set/checklist was designed to guide evidence-based treatment for COPD exacerbations.

Multiple PDCA cycles were performed with the paper order-set/checklist being distributed to 8 of the internal medicine housestaff teams at the start of each week in August 2016.

Chart reviews were done for patients treated for a COPD exacerbation in August 2016 via emr generated reports.

An electronic survey was administered to the internal medicine housestaff who were on a medicine team on the Menino campus during August 2016.

Cause-and-Effect Diagram

Measure
Outcome Measure: Percent of patients who received nasal cannula with an order

Process Measure: Percent of housestaff always using a COPD Order Set

Process Measure: Percent of housestaff who felt that using this order-set/checklist improved quality of care (efficiency/efficacy) for patients treated for a COPD exacerbation

Balancing Measure: Percent of housestaff who felt that using this order-set/checklist detracted from their workday

Assumptions
Most of the time, the resident is the primary decision maker in titrating oxygen for patients with COPD exacerbation. The resident orders the oxygen and the titration goal.

Perceptions

Improving the documentation and administration of titration goals for COPD patients will improve the efficiency of care.

Conclusion

There was an increase in time in the percent of appropriate titration goals associated with nasal cannula orders following the introduction of the paper order-set/checklist.

100 % of housestaff did not feel that using this intervention detracted from their workday.

Future Interventions

Change how nasal cannula oxygen is ordered in EMR

Prompt for flow rate as well as target oxygen saturation goal

Create a formal COPD oxygen order set in the EMR

Educational activities regarding goal oxygen saturation targets (lecture for housestaff, lecture for RN)

Limitations

Paper Order-Set/Checklist

Sustainability – requires paper copies to be made available each week given frequent housestaff turnover

Chart Review

Selection bias due to using a diagnosis related grouper / problem based charting which therefore may not capture all patients treated for COPD exacerbations.

Ultimate goal is to ensure appropriate oxygen saturation and appropriate use of nasal cannula with a titration goal; however, EMR does not capture correlation accurately at this time

Results

In September 2016, a survey was distributed to the residents and interns who were a part of our intervention group who was responsible for documentation. Figure 3 demonstrates the residents’ reported use of the paper order set. Figure 4 reflects resident perception of whether using the paper-order set detracted from their workday. Figure 5 portrays the percent of residents who believe using an electronic order set would improve (1) efficiency (2) standardization of care (3) evidence based practice. Figure 6 shows the percent of residents who self-reported the use of an oxygen titration goal.

References