

Implementing High-Flow Nasal Cannula Therapy in the Emergency Department

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Purpose

Patients with respiratory distress present to the Emergency Department (ED) primarily due to hypoxia, hypoxemia and hypercapnea. These critically ill patients are commonly managed using non-invasive ventilation therapy (NIV), which is comprised of Continuous Positive Airway Pressure (CPAP) and Bilevel Positive Airway Pressure (BiPAP). In our organization, patients requiring NIV therapy are admitted to the intensive care unit (ICU) or step-down area because of frequent monitoring. In addition, CPAP and BiPAP are considered ventilators, which require orders from providers who are credentialed with ventilator privileges.

In analyzing the cost effectiveness of NIV therapy through retrospective chart review, it was identified that there were total of 94 ED patients placed on NIV, who were admitted to ICU in CY2017. The higher level of care was necessitated because of the need for a provider with ventilator privileges. This led the respiratory therapy (RT) and ED nursing teams to implement the use of high-flow nasal cannula therapy that addresses hypoxemia and hypercapnea as effectively as CPAP and BiPAP, but does not require ventilator-privileged provider orders. The purpose of this study is to examine the effect of implementing high-flow nasal cannula therapy on ICU admission of adult patients presenting in ED with respiratory distress/failure.

Design

This project was identified as a process improvement project.

Setting

The setting was in the 33-bed ED of a 210-bed community hospital in the southwest suburban Chicago.

Participants/Subjects

The subjects were alert, oriented, spontaneously breathing but respiratory distressed patients presenting in our ED.

Methods

In implementing this process and quality improvement, the teams followed the evidence-based practice model and identified the Population, Intervention, Comparison, Outcome, and Time frame (PICOT) question:

Among the adult ED patients presenting with respiratory distress/failure (P), does utilizing high-flow nasal cannula therapy (I) compared to using the traditional non-invasive ventilation therapy (C) decrease Intensive Care Unit (ICU) admission (O) during CY2018 (T)?

In order to decrease ICU admission for respiratory depressed patients, the ED and RT teams implemented the use of high-flow nasal cannula for patients meeting criteria instead of routinely utilizing NIV therapy, which includes CPAP and BiPAP. Implementation of high-flow nasal cannula therapy involved a creation of clinical pathway for ED and RT teams. Inclusion criteria included patients who are in respiratory distress as evidenced by tachypnea, labored breathing and abnormal pulse oximetry or capnography. In addition, patients should have a history of chronic lung disease and their arterial blood gas analysis should reflect a pH of ≥ 7.25 .

Results/Outcomes

The use of high-flow nasal cannula therapy on patients meeting criteria reduced ICU admission from 94 in CY2017 to 56 in CY2018, which is a 40% reduction.

Implications

Stakeholder buy-in is necessary in initiating high-flow nasal cannula therapy instead of NIV on patients presenting with respiratory distress/failure. ED physicians, advanced practice providers and ED nurses may resist the utilization of this therapy because of misconceptions and knowledge deficit. The ED and RT teams provided education and training before and during project implementation, but reinforcement of positive patient outcomes increased stakeholder utilization.

References

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