

Patient Monitoring Quality Improvement Program: Impact on Respiratory Compromise

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Background/Introduction: Acute respiratory compromise events are common on inpatient hospital wards¹. Analyses of closed claims related to postoperative opioid-induced respiratory depression specifically have demonstrated that 97% were deemed preventable with improved patient monitoring and intervention². Continuous patient monitoring of oxygenation and ventilation has been recommended for such patients³; however, there are currently limited data evaluating how this change in practice affects patient outcomes. Therefore, the purpose of this study was to assess the impact of a quality improvement program (QIP) that established continuous capnography and pulse oximetry monitoring in recovery settings for high-risk patients.

Methods: A hospital Patient Safety Committee instituted a QIP with continuous capnography and oximetry monitoring in October 2013 on the Orthopedic, Medical/Surgical, Intensive Care and Post-Anesthesia Care Units for patients with STOP-BANG scores ≥ 3 . Subsequently, 38 months of data on 2,258 postoperative discharges were analyzed using UB04 billing data. Respiratory adverse events (RAE) were evaluated as: 1) all respiratory events including any secondary respiratory diagnosis of hypoxemia, asphyxia, respiratory arrest and failure, 2) PSI-11 (secondary diagnosis of respiratory failure and/or re-intubation/mechanical ventilation), 3) postoperative respiratory failure, and 4) cardiac arrest/resuscitation. Changes in length of stay for RAE, ICU transfers and mortality were also determined. Comparisons were made between all metrics at the start (2013-2014) and at the end of the QIP monitoring period (2015-2016).

Results: Following QIP initiation, the total number of RAE changed from 90 (6.84% of hospital events) to 87 (9.22% of hospital events) ($p < 0.05$). Postoperative respiratory failure and cardiac arrest/resuscitation events decreased from 6 (0.45% of hospital events) to 0 and 7 (0.52% of hospital events) to 0 ($p < 0.05$), respectively. PSI-11 related events did not significantly change (1 to 0; $p = 0.38$). Length of stay for all respiratory event with from 9.2 to 6.5 d ($p < 0.05$), while ICU transfers and mortality did not significantly change ($p > 0.05$). Documented compliance with continuous monitoring went from 22% at the start of the program to 97% at the end.

Conclusions: The implementation of a hospital-based QIP that established continuous monitoring with capnography and pulse oximetry was associated with a decrease in postoperative respiratory failure, cardiac arrest/resuscitation events and length of stay from a respiratory event. This program did not result in changes in PS-11, ICU transfers or mortality. These data suggest that continuous monitoring with both capnography and pulse oximetry may play a role in quality improvement by helping to reduce severe respiratory adverse events and length of stay for high risk patients.

References:

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3. Joint Commission, and Joint Commission. "Sentinel Event Alert. Safe use of opioids in hospitals. Issue 49; August 8, 2012." (2013).