Aim Statement:
The goal of this Quality Improvement Project is to reduce ventilated MICU patient overexposure to hyperoxygenation through RN titration of FiO$_2$.

Introduction
Hyperoxia can cause alveolar injury, pulmonary edema and a systemic inflammatory response. Excessive oxygen supplementation in mechanically ventilated patients with acute lung injury may worsen lung function. Hyperoxia has been associated with increased mortality in patients with stroke, traumatic brain injury and cardiac arrest. While clinicians (ICU RNs and Critical Care Physicians) readily accept the potential harms associated with hyperoxygenation, there is considerable discrepancy in their faithfulness to this delivery method. This discrepancy can be mediated with the development of conservative oxygen therapy protocols and Critical Care Nursing education.

Measurement:
FiO$_2$ and SpO$_2$ levels were collected from the EMR for the calendar year predating the study intervention and for 2 months post-intervention using Structured Query Language. Over exposure minutes were calculated as sum of the minutes between an O$_2$ reading >90 and a FiO$_2$ setting > 50 until the next O$_2$ reading.

Hyperoxigenation Results:
- Pre-intervention: 31.0%
- Post-intervention: 18.0%.

Discussion and future direction
These results indicate Critical Care Nursing education can influence delivered FiO$_2$.

The RN FiO$_2$ titration policy will need to be further codified to ensure durability of its initial success. This will be accomplished through creation of an FiO$_2$ titration EMR order set packaged with the MICU Admission Navigator, as well as with annual and orientation MICU RN education.

Portability of the project will be evaluated by bringing the project to the Hennepin County Surgical Intensive Care Unit, and then to the University of Minnesota.

References
2) Rachmale, Sonal, et al. “Practice of Excessive FIO2 and Effect on Pulmonary Outcomes in Mechanically Ventilated Patients With Acute Lung Injury.” American Association for Respiratory Care, Respiratory Care, 1 Nov. 2012, rc.rcjournal.com/content/57/11/1887.full.