# Vasopressor requirements in mechanically ventilated patients receiving dexmedetomidine versus propofol

KentuckyOne Health®
Saint Joseph East

Breanne Martinez, PharmD; Steven Berger, PharmD; Chelsea Owen, PharmD, MPH, BCPS; Greg Mateyoke, PharmD

## Background

•Propofol causes central nervous system depression by gamma-aminobutyric acid (GABA) agonism and reduced glutamatergic activity through N-methyl-D-aspartate (NMDA) receptor blockade. Propofol is highly lipophilic and allows for an onset of action of about 30 seconds.[1]

•Propofol is administered via continuous infusion due to dose and rate dependent hypotension that was shown in an observational study of 25,981 patients. Fifteen percent of patients developed hypotension defined as a systolic blood pressure of less than 90 mmHg and 77% of these events occurred within 10 minutes of induction of propofol. [2]

•Dexmedetomidine works by activating alpha-2 adrenergic receptors in the brainstem resulting in the inhibition of norepinephrine release.[3]

•Devabhakthuni and colleagues determined that patients receiving high dose dexmedetomidine (>0.7 µg/kg/h) had a significantly higher rate of hypotension than those on standard dose dexmedetomidine (≤0.7 µg/kg/h).[4]

•Vasopressors are often indicated for decreases greater than 40 mmHg from baseline systolic blood pressure, or mean arterial pressure (MAP) of less than 65 mmHg when end-organ dysfunction is suspected.[5] Vasopressors are beneficial due to their ability to induce vasoconstriction and elevate a patients' MAP.

•In the literature to date it has yet to be determined if patients require increased amounts of vasopressors due to sedating medications. The purpose of this study is to determine if there is a difference in vasopressor incidence in patients receiving propofol versus dexmedetomidine while intubated in the ICU at Saint Joseph East and Saint Joseph Hospital within the last 24 months.

## Objective

•To retrospectively analyze vasopressor use in mechanically ventilated patients receiving propofol or dexmedetomidine in an ICU setting.

## Definitions

•In order to define a patients APACHE II score, temperature, MAP, heart rate, respiratory rate, PO2, pH, Na, K, creatinine, hematocrit, white blood cell count, Glasgow Coma Score, age and chronic diagnosis will be evaluated.

•A patients level of sedation is quantified by utilizing the Richmond Agitation-Sedation Scale (RASS) for which propofol and dexmedetomidine are titrated to a level of light sedation defined as RASS -2 to 0.

## Methods

- Multi-center, retrospective, observational cohort study
- Inclusion Criteria:
  - Patients receiving propofol or dexmedetomidine via continuous infusion
  - ≥18 years old
  - Mechanically ventilated
  - Admitted to the ICU at Saint Joseph East and Saint Joseph Hospital
- Exclusion Criteria:
  - Non-mechanically ventilated patients outside of the ICU
  - Patients admitted to the CTVU at Saint Joseph Hospital
  - Patients who received propofol and dexmedetomidine during the same admission

## Outcomes

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| Primary Outcome | •Incidence of vasopressors in patients receiving propofol versus dexmedetomidine |
| Secondary Outcome | •Duration of vasopressor use<br>•Number of vasopressor agents required<br>•Maximum infusion rate of vasopressors<br>•Percent change of MAP over time<br>•ICU length of stay and in-hospital length of stay |

## Data Collection

•Data will be obtained utilizing electronic medical records

### Data to be Collected

•Baseline characteristics:
  - •Age
  - •Gender
  - •Weight
  - •Race
  - •APACHE II Score
  - •Admitting Diagnosis
  - •Baseline MAP
- •Incidence of vasopressor support
- •Duration of vasopressor use
- •Percent change of vasopressor use
- •Percent change from baseline of MAP
- •Mechanical ventilation duration
- •ICU and hospital length of stay
- •Use of midazolam and/or fentanyl

## Statistical Analysis

•Categorical Data:
  - •Chi-squared test and Fisher's exact test where appropriate
- •Parametric continuous data:
  - •Student's t-test
- •Non-parametric continuous data:
  - •Wilcoxon rank sum test
- •The criterion for significance is set at an *a priori* $\alpha$ of 0.05
- •Data analysis will be performed using Microsoft Excel and SAS statistical software

## References

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