Program Evaluation: Weaning Protocol Utilizing Dexmedetomidine (Precedex) to Result in Decreased Mechanical Ventilation (MV) Time

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Clinical Question

In mechanically ventilated ICU patients who are at high risk for failed extubation, how does the addition of Dexmedetomidine (Precedex) reduce overall invasive mechanical ventilation time and rate of reintubation within 24 hours of extubation?

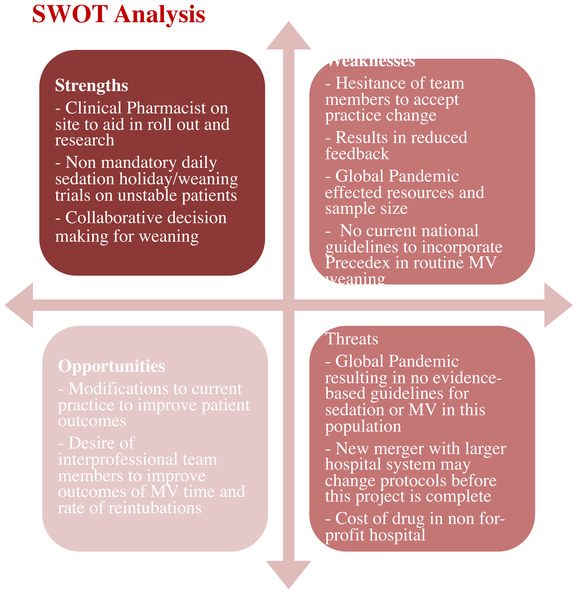
Introduction

- The use of Dexmedetomidine (Precedex) during weaning of Mechanical Ventilation (MV) of patients in the Intensive Care Unit (ICU) can aid in the reduction of reintubation risk and days of MV in those patients who are at high risk of failed extubation (Fraser et al., 2013).
- When weaning off sedation with plans for extubation, Propofol and Dexmedetomidine have been shown to have shorter times to extubation versus Benzodiazepines (Devlin et al., 2018; Fraser et al., 2013).
- This project will aim to complete a program evaluation of the use of Dexmedetomidine for sedation by conducting a gap analysis of current practices with evidence based research to present a modified protocol with the goal of improving duration of MV time, rate of reintubation within 24 hours of extubation in the ICU setting.

Background & Significance

- Reintubation rates fall between 10-20% in the general ICU population in the USA (Whitmore & Mahambray, 2015) and evidence shows that failed extubation can worsen outcomes
- This has ended up resulting in ICU mortality rates between 25-50% in this population (Whitmore & Mahambray, 2015).
- Length of MV days, extended ICU stay, and increasing risk of mortality show poor prognoses for the patient, poor outcomes for the hospital, and increased cost for the hospital systems (Seymour et al., 2004).
- The use of Dexmedetomidine during weaning of MV of patients in ICU can aid in the reduction of reintubation risk and days of MV in those patients who are at high risk of failed extubation (Fraser et al., 2013).

SWOT Analysis



Objectives

- Obtain user feedback in order to evaluate the institution's sedation guidelines to shorten the length of MV time, failed extubations, and rate of reintubations within 24 hours.
- Retrospective chart review to form a baseline of how Precedex was used in this facility in order to improve measurable outcomes including total MV time rate of reintubation.
- Provided evidence based, patient centered, and disease specific modified program guidelines for the use of Precedex in high risk extubation patients based on the recommendations from national guidelines.

Methods

- **Design:** Gap analysis with resulting program evaluation and user feedback surveys
- **Setting:** 24 bed mixed MICU/SICU
- **Sample:** Purposeful sample 100 charts reviewed in order to have 50 charts in control group and 50 charts to be experimental. Specific inclusion and exclusion criteria with age, MV time, comorbidities, and admission in 2019 over 24 hours
- **Recruitment & Interventions:** 100 charts from 2019 of patients on Dexmedetomidine for greater than 24 hours were reviewed for inclusion/exclusion criteria. User feedback surveys were distributed via email, survey monkey and on paper in ICU staff lounge.
- **Measures:** Survey used Likert type scale to extract feedback; mean length of stay and MV time was measured as well as rate of reintubation via percentage.

Results

Retrospective Chart Review

Table 1

Mean Length of Stay (LOS) and MV Time (Hours)

	LOS (Days)	MV Time (Hours)
Experimental Group	16	159
Control Group	13	90

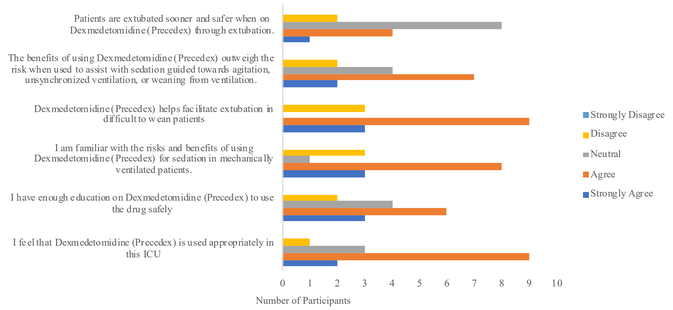
Table 2

Rate of Reintubation

	Yes	No	Percentile
Experimental	6	21	22.2%
Control	2	25	7.4%

Results (continued)

User Feedback Survey



Discussion

- Literature had encouraged the start of this project, and thus proved that this ICU would benefit from a more standardized protocol when weaning this drug.
- The outcomes did support the literature presented in the study known as the stepping stone for the use of Dexmedetomidine
- **Facilitators:** easy accessibility to EMR, swiftness of the facility's IRB, interprofessional collaboration, and poor patient outcomes that will help prove that a modification would be appropriate.
- **Barriers:** team members were not encouraged to participate in the study as their focus was caring for the COVID-19 influx in the ICU, infrequency of staff meetings with the pandemic made it difficult to keep the team consistently in the loop, and

Implications/Recommendations

- A designated protocol for sedation weaning in conjunction with MV weaning based off of past medical history and current vital signs would be extremely beneficial to future outcomes in this ICU.
- This project will be continued by the nursing research council and ICU staff in order to formulate a sustainable order set for Dexmedetomidine and MV weaning.

References

Fraser, G. L., Devlin, J. W., Worby, C. P., Alhazzani, W., Barr, J., Dasta, J. F., Kress, J. P., Davidson, J. E., & Spencer, F. A. (2013).
Seymour, C. W., Martinez, A., Christie, J. D., & Fuchs, B. D. (2004). The outcome of extubation failure in a community hospital intensive care unit: A cohort study. *Critical Care (London, England)*, *8*(5), R322–R327. cmedm.
Whitmore, D., & Mahambray, T. (2015). Reintubation following planned extubation: Incidence, mortality and risk factors. *Intensive Care Medicine Experimental*, *3*(Suppl 1). https://doi.org/10.1186/2197-425X-3-S1-A684