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Evaluation of Sleep Hygiene Checklist for Delirium in an Intensive Care Unit

Ying Wei
University of Missouri-St. Louis, ywdf5@mail.umsl.edu

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Ying Wei, BSN, RN

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Advisory Committee

Louise C. Miller, PhD, RN

Susan Dean-Baar, PhD, RN, CENP, FAAN

Jackie Graham, MSN, RN

Abstract

Problem: Delirium is a severe complication brought on by sleep deprivation that could increase mortality and prolong intensive care unit (ICU) stays in critically ill patients. This project aimed to develop and implement a sleep hygiene checklist to decrease the incidence of delirium in a Medical Intensive Care Unit (MICU).

Methods: This study used a pre-post design to compare the incidence of delirium pre-and post-implementation of the sleep hygiene checklist. Forty-four patients and thirty-six patients were recruited for the pre-and post-intervention groups, respectively.

Results: The result of this study demonstrated use of a sleep hygiene checklist could decrease the incidence of delirium by 9% over a one-month period of time. In addition, this study also suggested that patients with cardiac arrest, respiratory failure, COPD exacerbation, drug overdose, alcohol withdrawal, neurological disorder/seizure/stroke, and septic shock were more likely to develop delirium, as well as those requiring intubation.

Implications for Practice: This study provides a reliable basis for continuing the use of the sleep hygiene checklist for patients in ICU. It also helps clinicians to anticipate the development of delirium better, thereby providing early intervention and ultimately improving health care outcomes.

Evaluation of Sleep Hygiene Checklist for Delirium in an Intensive Care Unit

Diseases that were once fatal are no longer deadly as a result of advancements in medicine and medical technology. Now patients with life-threatening illnesses can be treated in the intensive care unit (ICU). Unfortunately, the critical care setting and treatments patients require in the ICU can potentially disrupt their normal sleep cycle and increase the risk of developing delirium. Delirium is diagnosed when the patient has "acute mental status changes or fluctuating changes in mental status, disorganized thinking, and an altered level of consciousness" (McPhee & Papadakis, 2018, p.61). Because delirium can have variable presentations based on severity, it is easily overlooked or missed. Delirium affects an estimated seven million hospitalized Americans each year (American Delirium Society [ADS], 2015). More than 20% of hospitalized patients develop complications associated with delirium, namely long-term cognitive impairment and aspiration pneumonia (Fong, Tulebaev, & Inouye, 2009).

In 2018, a large teaching hospital located in a Midwest metropolitan area reported 53.5% of patients in the ICU experienced delirium. In comparison to other facilities in the health care system around a similar size, this teaching hospital had the highest rate of delirium. Delirium is shown to be associated with a high mortality rate and prolonged length of ICU stay (Rood, Schoor, Tertholen, Pickkers, & Boogaard, 2019). There are many modifiable and non-modifiable risk factors that can contribute to delirium. Sleep deprivation is one of the most important modifiable risk factors that could be improved by implementing a sleep hygiene checklist. The Society of Critical Care Medicine "Practice Guidelines for Pain, Agitation, Delirium" (2018) recommends using a sleep-promoting, multicomponent protocol in critically ill patients to prevent delirium.

To prevent delirium from occurring, it is crucial to have an effective assessment tool to detect delirium in its early stage. The Confusion Assessment Method for Intensive Care Unit (CAM-ICU) and the Richmond Agitation and Sedation Scale (RASS) are the most reliable and validated tools to diagnose delirium in the ICU. The Society of Critical Care Medicine recommends using RASS in conjunction with the CAM-ICU to assess and diagnose delirium (Barr & Pratik, 2013). Both the RASS and the CAM-ICU are tools that have been implemented in the Epic electronic charting system and are currently used to assess the level of consciousness and delirium in the MICU at this teaching hospital.

The purpose of this project was to improve the quality of sleep and decrease the incidence of delirium with the aim to implement a sleep hygiene checklist intended to promote six hours of uninterrupted sleep at night for patients in the MICU. The primary outcome was to measure whether implementing a sleep hygiene checklist would decrease the incidence of delirium. The secondary outcome was to determine if there was a relationship between the patient's diagnosis and risk of developing delirium in critically ill patients. Therefore, the clinical question addressed was *how will the implementation of a sleep hygiene checklist affect the incidence of delirium as measured by the CAM-ICU in ICU patients when compared to ICU patients without a sleep hygiene checklist over a one-month period?*

Review of the Literature

Databases used for the literature review include PubMed, National Institutes of Health (NIH), Ovid, CINAHL, and EBSCO. The keywords used in the search were: *sleep hygiene, sleep deprivation, sleep disruption, delirium, Confusion Assessment Method (CAM), earplugs,* and *eye masks*. These were searched in combination with the term *sleep*

quality. Publication years ranged from 2005 to 2019 because there is limited data before 2005. The literature review contains 14 articles classified as level 5 and above based on Melnyk Levels of Evidence (Melnyk & Fineout-Overholt, 2011).

The literature demonstrates the importance of preventing delirium in critically ill patients because it can lead to increased mortality rate and long-term cognitive changes. Rood, Schoor, Tertholen, Pickkers, and Boogaard (2019) conducted a retrospective cohort study in a university hospital. They found there was an increase in mortality within 90 days of delirium, and patients with delirium required mechanical ventilation for a significantly longer period of time. An increase in the length of hospital stay was also highlighted in a systematic review conducted by Siddiqi, House, & Holmes (2006). It was found that the mean length of hospital stay was significantly increased from nine to thirty-two days due to delirium.

Delirium is not always reversible but is highly preventable. It is crucial for clinicians to identify risk factors and provide early intervention to prevent it from occurring. A systematic review identified potentially modifiable risk factors of delirium, including immobilization, sustained sleep deprivation, medications, and the environment (Fong, Tulebaev, and Inouye, 2009). They also suggested that nonpharmacological strategies should be the first-line treatment for patients with delirium.

Besides negative health implications, delirium also has negative financial ramifications because the occurrence of delirium results in increased healthcare costs. Lesile, Marcantonio, Zhang, Leo-Summers, and Inouye (2008) conducted a retrospective cohort study to determine the total one-year healthcare cost associated with delirium. They found that delirium increased healthcare costs from $60,516 to $64,421 per year

using data from 1995-1998. Health care costs associated with delirium has increased by 119% since 2008 when this analysis was published. Now, the national cost of delirium is estimated to be $143 billion to $152 billion annually.

The RASS and CAM-ICU have been widely used to assess the level of consciousness and to measure delirium in the ICU setting. RASS is an observational instrument used in the ICU to evaluate and determine the patient's level of consciousness. Obtaining the RASS score is the first step in performing the CAM-ICU. The RASS is a valid and reliable assessment tool with a sensitivity of 85% and a specificity of 92% (Chester, Harrington, & Rudolph, 2012). Barr and Pratik (2013) performed "a psychometric analysis of five delirium monitoring tools and concluded that the Confusion Assessment Method for the ICU (CAM-ICU) is the most valid and reliable delirium monitoring tool for adult ICU patients" (p.7). The CAM-ICU is explicitly designed to allow the clinicians who regularly practice in areas other than psychiatry to diagnose delirium accurately by providing cognitive testing for patients who are not able to communicate in the ICU. The CAM-ICU diagnostic algorithm includes four core features of delirium: "acute onset and fluctuating course of mental status, inattention, disorganized thinking, and altered level of consciousness" (Wei, Fearing, Sternberg, & Inouye, 2008, p.2). A diagnosis of delirium based on the CAM-ICU requires a positive result, achieved by the patient exhibiting signs of the four features (Khan et al., 2018). Wei et al. (2008) conducted a systematic literature review and found the CAM-ICU has "a sensitivity of 95-100%, a specificity of 93-98%, and interrater reliability of 0.79-0.95" (p.7). Therefore, this tool can correctly predict delirium states. Using the CAM-ICU and

RASS could help to select appropriate samples for this study and help to obtain accurate results by recognizing the occurrence of delirium.

Patients in the ICU are surrounded by continuous noise, lights, and frequent nursing care that could contribute to disruption in patients' sleep and lead to delirium. Matthews (2011) conducted a systematic review and found that sleep disturbances have been linked with alterations in immune function, metabolism, impairment of cognitive abilities, anxiety, increased pain intensity, and decreased quality of life. These adverse physiological and psychological outcomes contribute to delirium among patients in the ICU (Matthews, 2011). Sleep is more likely to be disrupted when patients are admitted to the ICU. The evidence shows that many factors in the ICU could result in sleep disruption (Matthews, 2011). These include pain, noise and lights, the use of sedatives, patient care activities, ventilator desynchrony, and circadian rhythm disturbance. Among these risk factors, environmental factors – which include noise, light, daytime sleep, and overnight nursing care – are modifiable. Due to the modifiable nature of these risk factors, it is necessary to develop a sleep promotion checklist that focuses on environmental factors in order to improve the quality of sleep. As supported by the literature (Lesile et al., 2008), incorporating an ideal sleep environment can lead to prevention of delirium and better health outcomes, such as a shortened ICU stay, a decrease in the required use of a mechanical ventilator, and potentially, a reduction of mortality.

As environmental factors have been identified as modifiable risk factors of delirium, it is crucial to develop and implement an intervention that could reduce these risks in order to prevent delirium. According to Barr and Pratik (2013), the best practice

when developing and implementing a sleep promotion program for adult ICU patients is "to modify the patients' environments by controlling light and noise, clustering ICU patient care, and decreasing stimuli at night to protect patients' sleep cycles" (p.18). Recent evidence has also demonstrated that implementing a multidisciplinary bundle of sleep-optimizing interventions to include minimizing noise, lights, and patient care during sleep hours leads to a reduction in incidence of delirium (Patel, Baldwin, Bunting, & Laha, 2014). Faraklas, Holt, Tran, Lin, Saffle, and Cochran (2012) found that an ICU environment with minimal night time stimuli could increase duration of sleep and decrease sleep disruption for ICU patients.

The literature revealed multiple studies that examined the use of earplugs and eye masks to increase the quality of sleep. Hu, Jiang, Zeng, Chen, and Zhang (2010) and Younis, Hayajneh, and Alduraibi (2019) found in their research the use of earplugs and eye masks improved sleep quality from patient's self-report, and it also increased amount of REM sleep and nocturnal melatonin. These environmental adaptations had more of an impact on sleep than medication, as found in a randomized crossover study on the effects of using propofol on the quality of sleep (Kondili, Alexopoulou, Xirouchaki, & Georgopoulos, 2012). This study reported that there is no difference in quality of sleep between patients who are on propofol compared to patients who are not. These authors recommended noise reduction during sleep hours and clustered nursing care with minimal interruptions during normal sleep cycle hours to improve the quality of sleep.

The literature supports using the strategy of sleep hygiene to decrease delirium in the adult ICU, thereby improving healthcare outcomes and reducing healthcare costs. The literature evidence also recommends using the RASS in conjunction with the CAM-ICU

to assess and diagnose the delirium in the ICU setting. However, a major limitation discovered in the current literature review is the need for consistent use of a sleep hygiene checklist on the patients who are on a mechanical ventilator. To avoid this limitation, this present project applied a sleep hygiene checklist to both adult patients who are on mechanical ventilators and those who are not. Another limitation identified in the literature review is that almost no research focuses on the relationship between a patient's diagnosis and the risk of developing delirium. Therefore, one objective of this present project was to determine the relationship between a patient's diagnosis and delirium in patients who meet inclusion criteria in the MICU.

The quality improvement framework guiding this project was the Plan, Do, Study, Act (PDSA) cycle. Each of the four steps facilitates feedback and possible changes needed for further improvement (Johnson & Sollecito, 2020). This model promotes the concept of small and iterative components of change in a single department to evaluate whether the project can be integrated into the system. The *Plan Do Study Act* cycle was used here to test whether the implementation of a sleep hygiene checklist decreased the incidence of delirium in the MICU. Additional PDSA cycles could refine the checklist protocol with the future goal of implementing the sleep hygiene checklist hospital-wide.

Methods

Design

This project used a pre-post design to compare the incidence of delirium pre-and post-implementation of the sleep hygiene checklist. The intervention used in this project was a tailored sleep hygiene checklist, which was created by a consensus of the intensivists, manager of the ICU, and unit-based staff nurses to address the quality of

sleep and manage delirium. In the *Plan* stage, the checklist was developed based on recommendations from the intensivists in the MICU and from previous research that reported effective sleep-promoting interventions. The sleep hygiene checklist (Appendix A) targeted reduction of risk factors for delirium and sleep disturbance by minimizing environmental stimuli, modifying the nursing care at night, and adjusting physicians' practices.

Specific measures to control environmental stimuli included the following:

- Turning off the television and decreasing the alarm noise on the bedside monitor by setting it to sleep mode during sleep hygiene hours (Faraklas et al., 2012).
- Limiting visitation during sleep hygiene hours
- Allocation of earplugs and eye masks to minimize noise and light if patients need (Hu et al., 2010; Younis et al., 2019).

Methods to modify the nursing care were:

- Limiting the care during sleep hygiene hours (Patel, 2014)
- Decreasing frequency of oral care for patients on ventilators during hygiene hours
- Decreasing the frequency of blood pressure monitoring from every fifteen minutes to every hour for patients who are on pressor therapy but who have not required an up-titration in the last two hours; monitor blood pressures every four hours for patients who are not on a pressor support. These blood pressure frequencies are based upon the recommendations from intensivists in this MICU.
- Avoiding obtaining labs and administering medicines during sleep hygiene hours.

The sleep hygiene checklist was available in all patients' rooms. Night shift nurses were responsible for checking off the completed interventions on the checklist.

The investigator audited the checklist every day to determine adherence. The RASS and the CAM- ICU were used to assess patients' level of consciousness and delirium, respectively. Patients who had a RASS score of -4 and -5 were ineligible for the CAM-ICU assessment, but they were reassessed every shift. If the patients had a RASS score greater than or equal to -3, CAM-ICU was used to assess the occurrence of delirium. Patients were considered delirious if they had a positive CAM-ICU assessment. Patients who met inclusion criteria were assessed for delirium using CAM-ICU by nurses once a shift during their ICU stays.

Setting

The project took place in an adult MICU in a major teaching hospital with 525 available beds in a Midwest metropolitan area serving over two million residents. The average daily census of the 12-bed MICU was approximately 12 patients.

Sample

The target population was all MICU patients who were 20 years of age and older, who had a RASS score greater than or equal to -3, and who spent more than one night in the MICU. Patients with a pre-existing sleep disorder or cognitive dysfunction were excluded. In addition, patients with RASS score of -4 or -5 and those requiring frequent nursing care, including insulin drip, continuous renal replacement therapy, balloon pump, paralytic, and who were hemodynamically unstable, were excluded.

Approval Process

The project was approved by the Institutional Review Boards (IRB) at the health system and the University of Missouri-St. Louis. Institutional data from the Electronic Medical Record (EMR)was collected; therefore, informed consent was not required.

Data Collection

Data collection consisted of two phases: baseline data prior to the implementation of the sleep hygiene checklist and after implementation of the checklist. In the *Do* stage, baseline data was retrieved from patient charts that were kept in the password-protected Epic Electronic Medical Record from February 1, 2019, to February 28, 2019; post-implementation data was collected from February 1, 2020, to February 29, 2020. The sleep hygiene checklist was introduced to staff nurses during the shift huddles and at the staff meeting in January. The checklist was implemented in the MICU on February 1, 2020. Patient data elements recorded were occurrences of delirium based on the assessment of CAM-ICU, patient diagnosis, a requirement for a mechanical ventilator, and ICU length of stays. Pre- and post-data collection time frames were matched to minimize potential time-of-year discrepancies among patients, assuming that similar patient diagnoses and characteristics were admitted to the MICU during the same months each year. Baseline data from 2019 was compared to post-implementation data recorded from 2020 to evaluate the impact of the sleep hygiene interventions. To identify patients' records, the investigator included admission diagnosis, patient's RASS score, the result of CAM-ICU assessment, length of ICU stays, and requirement for a mechanical ventilator in the data review. Demographic information recorded in the EMR was collected, which included the patient's age, gender, and race. Data were extracted from the chart reviews and unit auditing of the sleep hygiene checklist. All data were collected anonymously, and no patient names were recorded in the data set. Instead, each patient was assigned a project number based on the year, the month, and sequence of the patient on the day that data were being collected.

Data Analysis

De-identified data were analyzed with Statistical Package for the Social Science (SPSS) software. A Chi-Square test was used to compare the incidence of delirium pre- and post-implementation of the sleep hygiene checklist, and a binary logistic regression test was used to examine the relationship between patient's diagnosis and risk of developing delirium. In addition, descriptive statistics summarized patients' demographic characteristics. Data were stored on an encrypted file that only the investigator has access and will be destroyed after seven years.

Procedures

Project implementation took place from February 1, 2020 to July 31, 2020.

- The checklist was introduced to staff numbers in staff meetings on January 2020.
- The sleep hygiene checklist was finalized by the MICU team and implemented on February 1, 2020.
- The retrospective chart review of 2019 and 2020 was completed in late May 2020.
- Data analysis was done in early June 2020

Results

A total of 44 patients were included in the 2019 data review before implementation of the sleep hygiene checklist. An additional 36 patients were recruited for implementation of the sleep hygiene checklist in 2020. Overall, the characteristics of the two group patients were similar. A Chi-Square test showed that there was no significant difference between two groups based on an alpha value of 0.05, $\chi^2(1) = 1.43$, $p = .232$. The average age between these two groups was 57 and 58. There were 27 (61%) female and 17 (39%) male in the pre-implementation group and 19 (53%) female

and 17 (47%) male in the post-implementation group. Regarding ethnicity, in the 2019 pre-implementation group, 21(48%) patients were African Americans and 23 (52%) were Caucasian. There were 22 (61%) African Americans and 14 (39%) Caucasian in the 2020 post-implementation group. The average length of ICU stays between 2019 and 2020 were similar, respectively four days and five days.

A total of 36 patients (180 nights) qualified for implementation of the sleep hygiene checklist in February 2020. One hundred sixty-two sleep hygiene checklists were completed by nurses in February 2020. There was a 90% compliance rate of sleep hygiene checklists completion. There were eleven interventions included in the sleep hygiene checklist. The highest completion rates among these interventions were: decreasing environmental stimuli (83%), assessing pain (83%), and avoiding obtaining labs during sleep hygiene hours (81%). Checking the blood pressure (40%) and administering medicine (67%) had the lowest completion rates.

A comparison of the percentage of incidence of delirium between 2019 and 2020 showed the overall percentage of delirium for the patients in 2020 (45%) was lower than the overall percentage of delirium for patients in 2019 (54%). Percentage of incidence of delirium decreased by 9% in 2020. To test whether implementing a sleep hygiene checklist decreased the incidence of delirium, a Chi-Square test was performed. The result was not statistically significant based on an alpha value of 0.05, $\chi^2(1)$ of 2.65, p = 0.103. It indicated there was no significant difference to decreasing the incidence of delirium for ICU patients in pre- and post-implementation of a sleep hygiene checklist (Table 1).

A binary logistic regression test was used to examine whether there was a relationship between the patient's diagnosis and risk of developing delirium in critically ill patients. The most common diagnoses seen in this project were cardiovascular disease, CHF exacerbation, cardiac arrest, COPD exacerbation, respiratory failure, DKA/hypoglycemia, drug overdose, alcohol withdrawal, DVT/PE, GI bleeding, neurological disorder/seizure/stroke, and septic shock. The result of binary logistic regression test showed statistical significance between the diagnosis of respiratory failure, COPD exacerbation, cardiac arrest, drug overdose, alcohol withdrawal, neurological disorder/seizure/stroke, and septic shock and an increased incidence of delirium (Table 2). However, the result of the binary logistic regression test was not statistically significant for the diagnoses of DKA/hypoglycemia, DVT/PE, GI bleeding, CHF exacerbation, which indicated that patients with these diagnoses have a lower risk of developing delirium (Table 2). In addition, the Chi-Square test suggested there was a significant relationship between intubation and risk of developing delirium in critically ill patients based on an alpha value of 0.05, $\chi^2(1) = 14.98$, and $p < .001$. This result indicated intubation could result in an increased incidence of delirium. Therefore, the investigator could estimate patients requiring intubation are also at higher risk of developing delirium.

Discussion

In comparison to the percentage of incidence of delirium in 2019, the implementation of the sleep hygiene checklist resulted in a reduction in the incidence of delirium in 2020. However, this result did not indicate a statistically significant difference between pre-and post- implementation of sleep hygiene checklist. It is more likely caused

by an inadequate study time due to unexpected policy changes in the facility. Based on the trend of current results, further reduction in the incidence of delirium can be predicted if the study's time was extended. This assumption is also supported by previous research study. Patel et al. (2014) implemented a multidisciplinary bundle of interventions on sleep promotion in the ICU for two months and found that implementation of the bundle of interventions leads to a significant reduction in the incidence of delirium.

The sleep hygiene checklist has shown benefits of promoting patients' sleep and decreasing the incidence of delirium. Data demonstrated a decrease in incidence of delirium by 9% in one month. Analysis of the sleep hygiene checklist showed that checking blood pressure and administering medicine had the lowest completion rates compared to other interventions. Several reasons could contribute to the lack of compliance. One reason could be that the patients in the ICU were hemodynamically unstable, which required more frequent blood pressure checks. Administration of medications during sleep hygiene hours could result from poor communication between nurses and pharmacists who could change the due time of medicine. This issue can be rectified by strengthening communication between team members.

The result of this project supported the assumption that there is a relationship between certain diagnoses and increase the incidence of delirium. Patients with certain diagnoses are more likely to develop delirium, as well as those requiring intubation. As such, the diagnoses including cardiac arrest, respiratory failure, COPD exacerbation, drug overdose, alcohol withdrawal, neurological disorder/seizure/stroke, and septic shock could be considered the risk factors for delirium. Knowing the risk factors for delirium can help facilitate early intervention to decrease the development of delirium.

There are several potential limitations in this study that should be addressed. First, the patients in this study were recruited from only one medical ICU. Second, this study only focused on helping patients sleep during night hours but lacked interventions to keep patients awake during the daytime. Daytime sleeping in the ICU is a significant issue that could interrupt the patient's sleep at night time. Approximately 50% of sleep occurs during the daytime for patients admitted to ICU (Pisani et al., 2015). It might be more beneficial to include interventions that aim at reducing sleep during the daytime. Another limitation is small sample sizes. The project was only able to obtain the data for one month, thereby likely limiting the power of statistical analysis. Studies over a longer time frame would be beneficial in evaluating effectiveness of the sleep hygiene protocol in reducing delirium in the ICU.

Conclusion

Results demonstrated use of a sleep hygiene checklist could decrease the incidence of delirium by 9% over a one-month period of time. This provides a reliable basis for continuing use of the sleep hygiene checklist for patients in ICU as shown by findings that there is a relationship. In addition, the study also found there was a relationship between certain diagnoses and increased incidence of delirium. Patients diagnosed with cardiac arrest, respiratory failure, COPD exacerbation, drug overdose, alcohol withdrawal, neurological disorder/seizure/stroke, and septic shock are at higher risk of developing delirium. This information could help clinicians to anticipate development of delirium better, thereby providing early intervention and ultimately improving health care outcomes.

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Appendix A

Sleep Hygiene Checklist

- □ Decrease environmental stimuli
  - □ Turn off lights, TV, and alarms in patient's room during sleep hours
  - □ Limit visitation during sleep hours
  - □ Provide earplugs and eye mask if patient needs
- □ Clustering of patient care activities
  - □ Do not disturb the patient with bath or wound care during sleep hours
  - □ Decrease the frequency of BP checking to:
    - □ q1h for patients who are on pressor support but have not required up-titration in the last two hours
    - □ q4h for the patients who are not on pressor support
  - □ Measuring urine output:
    - □ Do not check urine output during sleep hygiene hours for patients who are hemodynamically stable
  - □ Oral care: oral care q4h
  - □ No lab draws during sleep hygiene if possible
  - □ Pass meds before 22:00; If there are medications scheduled in the middle of night, ask the MD team if it can be rescheduled
  - □ Assess pain at the beginning of shift and as needed

Adapted from "The pain, agitation, and delirium care bundle: Synergistic benefits of implementing the 2013 pain, agitation, and delirium guideline in an integrated and interdisciplinary fashion," by Barr, J., & Pratik, P. (2013). *Critical Care Medicine. 41*(9), 99-115. doi: 10.1097/CCM.0b013e3182a16ff0; "The effect of a multicomponent multidisciplinary bundle of interventions on sleep and delirium in medical and surgical intensive care patients," by Patel, J., Baldwin, J., Bunting, P., & Laha, S. (2014). *Anesthesia, 69*, 540-549. doi:10.1111/anae.12638; and recommendations from the intensivists at St. Mary's Hospital.

Table 1

A Chi-Square test for the incidence of delirium by Pre or Post

	The incidence of delirium				
Pre_or_Post	0	1	χ^2	*df*	*p*
2019	77[83.95]	64[57.05]	2.65	1	.103
2020	104[97.05]	59[65.95]			

Note. Values formatted as Observed [Expected].

*Indicates significance at alpha <0.05

Adapted from "Intellectus Statistics [Online computer software]". (2020). Intellectus Statistics. https://analyze.intellectusstatistics.com/

Table 2

A Binary Logistic Regression test to predict the relationship between patient's diagnosis and increase the incidence of delirium

Diagnosis	B	SE	Wald	df	*p* value	OR
Alcohol withdrawal	1.609	0.632	6.476	1	0.011*	5.0
AMS/stroke/seizure	1.179	0.572	4.249	1	0.039*	3.250
Cardiac arrest	1.299	0.651	3.979	1	0.046*	3.667
CHF exacerbation	-0.405	0.913	0.197	1	0.657	0.667
COPD exacerbation	0.847	0.398	4.523	1	0.033*	2.333
DKA/Hypoglycemia	-1.792	1.080	2.752	1	0.097	0.167
Drug Overdose	1.099	0.516	4.526	1	0.033*	3.000
STEM/NSTEM	-0.405	1.394	0.085	1	0.771	0.667
DKA/Hypoglycemia	-0.847	1.574	0.290	1	0.590	0.429
GI bleeding	-1.090	1.155	0.905	1	0.341	0.333
Resp failure	1.046	0.322	10.525	1	0.001*	2.846
Septic Shock	0.738	0.367	4.048	1	0.044*	2.091

*Indicates significance at alpha <0.05

Adapted from "IBM SPSS Statistics [Online computer software]". (2020).