AN ADVANCED PRACTICE PROVIDER-DRIVEN SLEEP HYGIENE INTERVENTION FOR DELIRIUM PREVENTION IN NEUROCRITICAL CARE PATIENTS

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PROJECT TEAM

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OBJECTIVES

- Review evidence supporting delirium prevention measures.
- Explain the implementation of a sleep hygiene focused quality improvement project in a neurocritical care population.
- Discuss the clinical implications associated with improved sleep hygiene.

INTRODUCTION AND BACKGROUND

- Delirium is defined as a state of altered level of consciousness often leading to confusion, inattention, and changes to levels of cognition (Baek et al., 2020). The three most common categories include: hyperactive, hypoactive, and mixed delirium.

- Risk factors for developing hospital delirium (Nazemi et al., 2017):
  - Age
  - Dementia
  - Use of general anesthesia
  - Long surgeries
  - Intraoperative hypercapnia and hypotension
  - Polypharmacy
  - Hearing loss
  - Psychiatric disorders
  - Admission to intensive care units (ICU)

REVIEW OF THE LITERATURE

Common themes from literature:

Nonpharmacological interventions	Pharmacological Interventions	Multicomponent interventions
• Most commonly recommended • Low-cost and low-risk to the patient (Jun et al., 2021) • Included: environmental control measures, nursing care plan interventions, specific ventilator modes	• Melatonin • Dexmedetomidine • Ramelteon • Propofol • High side effect profiles (Grimm, 2020) • Overall lack of evidence supporting the use of a medication to induce sleep and prevent delirium (Patel et al., 2014).	• Single interventions not as successful as a combination of components (Grimm, 2020) • Multicomponent protocols are shown to decrease rates of ICU delirium (Tonna et al., 2021)

PURPOSE

The purpose of this scholarly project was to increase implementation of a current evidence-based sleep hygiene bundle in a large academic medical center's neurocritical care population. If goals are met, rates of delirium will be decreased, thus improving patient outcomes.

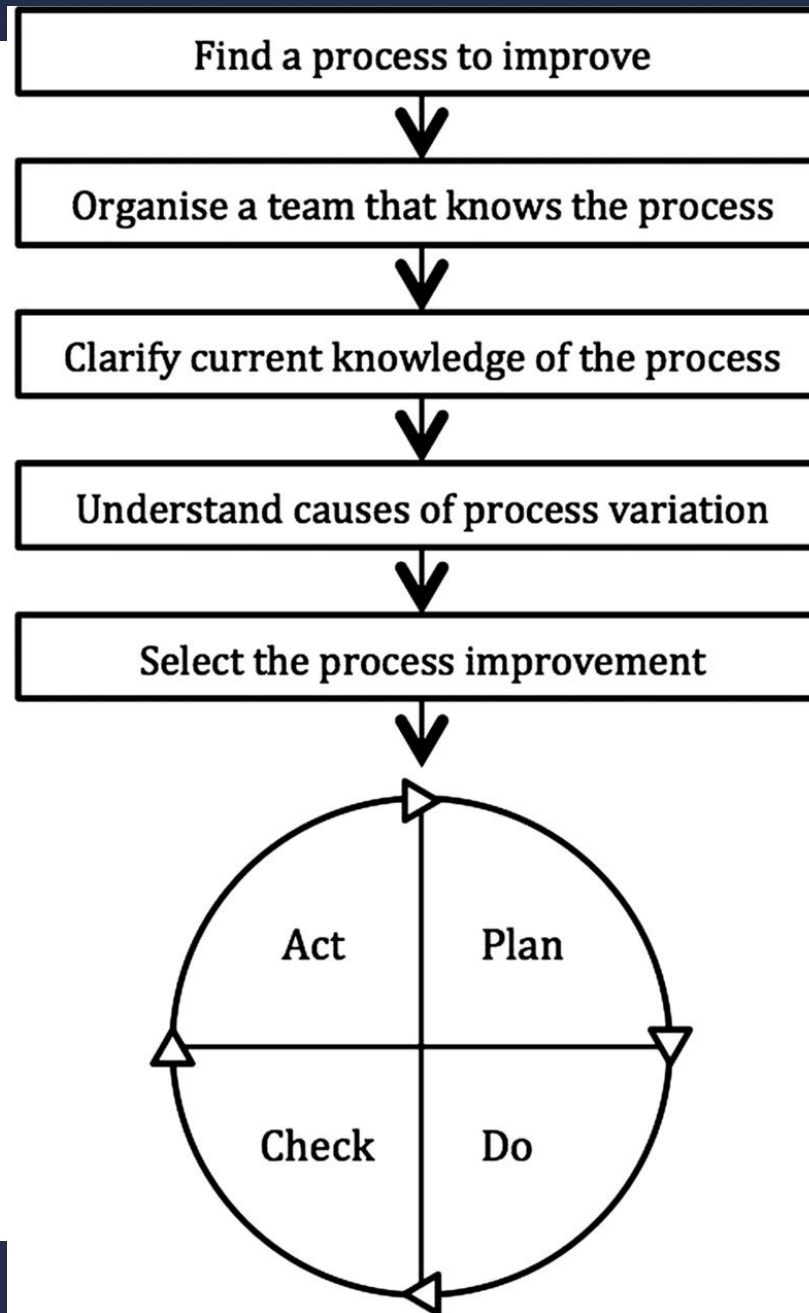UVA | SCHOOL of NURSING

FRAMEWORK

Figure 1. FOCUS PDCA Model (Taylor et al., 2014)

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PROJECT DESIGN

Plan:

- Creation of project team with unit stakeholders
- Collection of data concerning pre-intervention delirium scores

Do:

- Intervention implementation

Check:

- Process and outcome measurement
- Data analysis

Act:

- Determine if data supports continued use of the rounding tool and sleep plan

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ORGANIZATIONAL ASSESSMENT

- Level 1 Trauma Center
- Comprehensive Stroke Center
- 12 bed neuroscience critical care unit (ICU)
- 12 bed neuroscience intermediate care unit (IMU)
- Census: 20 patients total between the two units
- Average length of stay: 5-6 days
- Both units staffed by the same group of Advanced Practice Providers who rotate between units
- Nursing staff limitations: turnover, float pool staff, travel RNs

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PROJECT DESIGN: Population and Setting

- Neurocritical care setting, including patients in the Neuroscience ICU and IMU

- Patients are 18 years of age and older.

- Common diagnoses include: ischemic stroke, hemorrhagic stroke, traumatic brain injury, postoperative multilevel spine surgery, postoperative craniotomy, seizures, among others

- Most common age group: 60-80 years of age

- Nearly even split between male and female patients

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INSTITUTIONAL REVIEW BOARD AND ETHICAL CONSIDERATIONS

- Prior to implementation, the project was submitted to IRB for determination.

- The project was determined not to meet the criteria of Research with Human Subjects and was therefore not subject to IRB-HSR review.

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DIVERSITY, EQUITY, INCLUSION

- The nature of the project was to enhance best practice regarding sleep hygiene interventions.

- Therefore, the project was universally applied to all patients admitted to the neurocritical care service regardless of age, sex, race, or other identifying factors.

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FINANCIAL ANALYSIS

- There was no cost associated with the implementation of this DNP project.

- In general, delirium costs the healthcare system approximately $148 billion dollars a year and increases length of stay by more than 7 days (Tonna et al., 2021) (Nazemi et al., 2017).

- An example:
  - In 2020, an East Coast hospital had approximately 187 discharges associated with the primary diagnosis of "intracranial hemorrhage or cerebral infarction with complication/comorbidity or TPA in 24 hours".
  - The average charge per patient, per day was $11,987 (*VHHA PricePoint*, 2020).
  - If a patient admitted for an intracranial hemorrhage, their stay could potentially cost an additional $83,909+.

WHAT IS QUIET AT NIGHT?

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	Work Performed by (when):	Major Step	Details	Importance
1	Shift Manager /HUC	Distribute hug lights to night staff requesting them	• Assure each night staff member given opportunity to use hug light device.	Tool to reduce light for resting patient.
2	Off going day shift RN / oncoming night shift RN	Bedside handover into night shift	• Mention need to discuss individual sleep plan for oncoming night when night RN returns to assess patient. • Jot "sleep plan" details on whiteboard and complete when discussed w patient / family early in shift.	Educate patient / family about our support for their rest, engage them in planning.

3	Night Shift RN	Discuss sleep plan w patient & family early in shift	• Use key phrases convey our support for patient rest:
			  ○ "We will do everything we can to ensure the area around your room is quiet at night."
			  ○ "We will do everything we can to help you with your pain during your stay."
			  ○ "Our goal is to give you a 4 hour block of time where interruptions are minimized."
			• Ask about what has worked for pt previously, what pt would like to try for tonight. Touch on pain management plan, specifically.
			• Offer pts sleep aids (ear plugs, eye shades, relaxation channel, etc). Use Sleep Plan handout to show options if needed.
			• Assess need for sleep meds and obtain LIP order as needed.
			• Discuss planned care for nights and how sleep will be incorporated. Assure all meds are on sleep sparing schedule for quiet period.
			• Remind P/F of unit quiet period for uninterrupted rest and how roommate considerations, visitor management and phone & TV etiquette can help all patients rest.
			• Jot sleep plan notes on whiteboard for P/F reference.
			• Coordinate care & comfort rounding w PCA / PCT.
			• Coordinate respiratory care w RT to maximize rest period.
				Convey our intention to support sleep as a priority among other care needs.

4	Night Shift RN & PCA / PCT	Coordinate care based on sleep plan.	• Discuss sleep plan for shift • Cluster care & coordinate comfort rounding • Reinforce sleep plan w P/F. • Offer sleep aids as needed.	Assure good communication & teamwork in supporting patient rest

5	Shift manager / HUC	At 2200 nightly: Assure unit prepared for quiet hour period	• Assure external unit doors closed and hallway lights dimmed. • Ensure staff has changed monitors to "Night Mode" (rhythm shows yellow on monitor display at nursing station). • Close patient room doors to reduce noise, if safe for patients. • Provide support to staff as needed to begin & maintain quiet time according to designated unit quiet hours. • Provide support to staff needing help with noise issues in semi-private rooms (eg visitor management, TVs, phone use, etc) • HUC provide support to visitors needing to vacate rooms regarding lounges, accommodation, etc • Assure no nurse call system overhead paging into rooms. • Provide gentle reminders to all team members to use quiet voices in common areas.	Provide structural & social support to unit and staff efforts to maintain quiet at night
6	All night staff	Keep area quiet & lights dim so patients can rest during designated sleep hours.	• Use quiet voices in common areas of unit 22-0500. • Provide gentle reminders to all team members to use quiet voices in common areas. • Identify and address sources of noise in area in the moment and to unit leadership for system issues. • Keep lights low / use hug lights when checking on patients & providing care during quiet hours • Cluster care to reduce noise & interruptions of rest whenever possible.	Provide structural & social support to unit and staff efforts to maintain quiet at night
7	Night Shift manager & Off going night RNs	Assure monitors taken off night mode in morning	• Check that in-room monitors are back in regular mode at day shift handover. • Assure central monitors are back in regular mode before departing shift.	Patient safety
8	Off going night RN / incoming day RN	Bedside handover	• Discuss w/ P & F effectiveness of Sleep Plan during night. • Review lessons learned for upcoming night. • Jot notes on whiteboard as indicated.	Include P/F in evaluation of sleep plan and how we can improve for next night.

Tools to support patient & family rest:

Eye mask (stocked in unit storeroom)	White Noise Channel on TV (channel 16)	Aroma therapy tabs (unit orders box of 50)
Ear plugs (stocked in unit storeroom)	Relaxation Channel on TV (channel 11)	Herbal tea (unit kitchen)

PRE PROJECT OBSERVATIONS

- Compliance with the hospital-wide sleep hygiene protocol based on observational data:
  - Lights off: 58% of the time
  - TV off: 70% of the time
  - Door closed: 64% of the time
  - Eye mask usage: 0% of the time
  - Earplug usage: 0% of the time
  - Lights often not dimmed in the units' hallway
  - Loud voices from staff in the units' hallway
- Prior to the project, unit practice did not include delirium scores and sleep hygiene as components for discussion during interdisciplinary rounds.

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INTERVENTION

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ICU ROUNDING TOOL

TOPIC:
Neuro Frequency/Delirium/Sleep: Q1? Q2? Q4? Decrease to promote rest? Pupillometry?
Pain: Controlled? Switch to oral?
VS Frequency/BP Parameters: SBP, MAP, or both? Requiring PRNs/gtts?
Temperature: Temp goal? Consider TTM Algorithm?
Sedation/RASS: Reason for sedation? RASS goal?
Respiratory/SBT/Vent Wean: If no SBT, reason? Wean plan? GI ppx?
HOB/Mobility/OOB Plan: 30 degrees? Other? If not OOB, why?
GI/Nutrition: IVF rate? PO? TF? SLP eval? Aspiration precautions?
Glucose Management: Home meds? SSI/Infusion?
Bowel Regimen: Date of last BM? Meds order per OBR protocol?
Infusions: Current rate?
Invasive Lines (i.e., CVL or foley): Remove? Indication?

PROJECT ADDITIONS:

- Did the night shift RN report any sleep disturbances?
- Is the patient receiving sleep aids?
- Interventions to promote daytime wakefulness: open blinds, increased stimulation, decrease polypharmacy as able

INTERDISCIPLINARY INPUT:

- Attending Physician
- Neurocritical Care Clinical Nurse Specialist (CNS)
- Pharmacists

IMU ROUNDING TOOL

NURSE ROUNDING TOOL:

Patient Presentation (LIP):
Name, age, admission problem, hospital events, past medical history

Systems Review (RN):
Previous shift issues, neuro deficits, SBP goal, diet

Areas of Concern:
- Medications
- Labs
- Mobility
- Foley
- Lines
- Drains
- Skin
- Delirium/Sleep
- Fluids
- I & Os
- DVT Prophylaxis
- Family Requests
- Risk Factors: CAUTI, HAPU, CLABSI, Falls, Aspiration

PROJECT ADDITIONS:

- Did the night shift RN report any sleep disturbances?
- Is the patient receiving sleep aids?
- Interventions to promote daytime wakefulness: open blinds, OOB as able, bed in chair position, increased stimulation, decrease polypharmacy as able

Sleep items requested: (circle)

- Eye mask
- Ear Plugs
- White Noise Channel 16
- Relaxation Channel 11
- Evening snack

- Fan
- Family presence*
  (*If acuity allows: 1 can be chosen*)
- Home CPAP

In select areas:

- Warm blanket
- Aromatherapy

Other: _____

Ideal Room Temperature: _____°F

Ideal Bedtime: _____

Nursing Notes: _____

_____

Sleep Aids ordered: _____

Pain management plan for "tuck in" time: _____

SLEEP PLAN

PROJECT ADDITIONS:

- Reminder: Quiet at Night from 2200-0500
- Lights out?
- TV off?
- Is it safe to shut the door?
- Plan to cluster care?
- LIP review of orders to facilitate clustering care

DATA MEASUREMENT

- The project was implemented for approximately 4 months (September - December).

- Process Measures:
  - A document was available for the APP of each unit to complete. Example:

ROOM NUMBER	ROUNDING COMPLETE?	SLEEP PLAN DATED FROM LAST NIGHT?
6186	✔	✔

- Outcomes Measures:
  - Delirium scores were collected using an EPIC Report.

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RESULTS

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PROCESS MEASURES

Neuro IMU Data Measurement	Neuro ICU Data Measurement
• Rounding compliance: 83% • Sleep Plan compliance: 11%	• Rounding compliance: 85% • Sleep Plan compliance: 31%

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OUTCOME MEASURES

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Department	Patient Count	Screenings Performed	Total # positive delirium	# positive patients in first 24 hours (POA)	# positive patients after 24 hours (Hospital-acquired delirium)
IMU					
2021	110	110	24	6	18
2022	133	132	21	11	10
IMU Total	243	242	45	17	28
ICU					
2021	78	77	25	14	11
2022	59	57	11	4	7
ICU Total	137	134	36	18	18
Grand Total	380	376	81	35	46

RESULTS

	2021 IMU	2022 IMU	IMU % Change from 2021	2021 ICU	2022 ICU	ICU % Change from 2021
# positive patients in first 24 hours (POA)	6	11	83%	14	4	-71%
# positive patients after 24 hours (Hospital-acquired delirium)	18	10	-44%	11	7	-36%
Total # positive delirium	24	21	-13%	25	11	-56%

DISCUSSION

- Limitations:
  - Incorrect usage of the delirium scales
  - Low adherence to sleep plan completion
  - Staff turnover

- Next steps:
  - Implementation of a project focusing on further adherence to sleep plans
  - Training and education for nurses regarding the correct usage of the CAM-ICU and NUDESC delirium scales.

- This project showed that there is great potential in the implementation of a sleep hygiene protocol to the rounding checklist.

CONCLUSION

- Approximately 80% of patients experience sleep deprivation during their stay in the hospital (Grimm, 2020).

- Lack of adequate sleep is associated with poor outcomes and impaired function of various organ systems (Litton et al., 2016).

- Overall, the implementation period for this project was associated with a 36-44% decrease in rates of hospital acquired delirium.

- Decreasing rates of delirium have potential not only to improve patient outcomes, but to also save the healthcare industry billions of dollars.

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QUESTIONS?

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