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Sleep Enhancement to Prevent Hospital-Acquired Delirium

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Abbott Northwestern Hospital

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Objectives

- List four contributing factors to delirium development and poor sleep in the hospitalized patient.
- Describe your role in developing and sustaining evidence-based practice initiatives to prevent delirium.

*Presenters do not have any disclosures or conflicts of interest

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Abbott Northwestern Hospital

- Largest not-for-profit hospital in the Twin Cities area
- Quaternary teaching medical center
- 952 licensed beds (avg. daily census ~575)
- Serves 200,000 patients / year
- 2,200 RNs
- Magnet designated

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Delirium is Preventable

- At least 30% of cases of delirium are preventable
- Prevention is the most effective strategy for minimizing the occurrence of delirium and its adverse outcomes.

Delirium is Costly and ↑ Mortality

-Annual health care costs attributable to delirium $164 billion
-Post-op delirium increases risk of 30-day mortality by 7-10%
-Delirium is associated with a 10-fold increased risk of death after hospitalization

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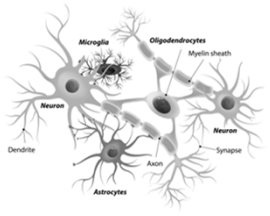
- Patients with neurological disorders develop delirium at higher rates compared to other inpatient populations:
  - Brain Tumor: 15 – 21%
  - Neurosurgical population: 32.4%
  - Dementia: 31 – 49%
  - Stroke: up to 48%
  - Parkinson's Disease: 56%
- Increased risk due to acute neurological injury, resulting in functional, sensory, and cognitive impairment
  - Associated with a breakdown of the blood brain barrier
  - Changes in CSF characteristics (albumin, IL-6, and lactate levels)

NEURONS AND NEUROGLIAL CELLS



5 Cullinan, 2023; Kappen et al, 2022; Gu et. al, 2022; Fong & Inoue, 2022; Chen et. al, 2020; Klimiec et al, 2016

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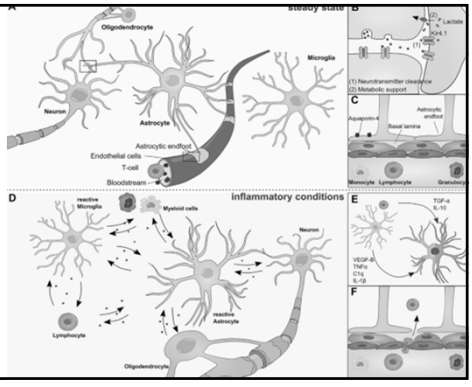
Astrocyte anatomy in normal conditions and inflammation



Linnerbauer & Rothhammer, 2020. https://pubmed.ncbi.nlm.nih.gov/33117368/

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Delirium Risk Factors

***Predisposing* Risk Factors**

- Age >65
- Pre-existing dementia
- Severe medical illness
- History of previous delirium
- Visual and hearing impairment
- Depression
- Abnormal sodium, potassium, and glucose
- Polypharmacy
- Alcohol/benzodiazepine use

***Precipitating* Risk Factors**

- Use of physical restraints
- Use of indwelling catheter
- Adding three or more medications
- Multiple bed moves
- Pain
- Surgery
- Anesthesia and hypoxia
- Malnutrition and dehydration
- Altered sleep wake cycle
- Immobility

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Delirium Risk Factors Continued

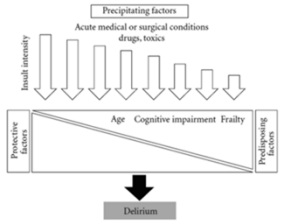

FIGURE 1: Relationship between predisposing, protective, and precipitating factors in delirium.

- Multiple factors increase a patient's risk for delirium.
- A standard prevention protocol recognizes that patients at risk and starts to level the playing field.
- Delirium significantly affects the outcomes for patients
  - Increases risk for mortality
  - Longer hospital length of stay
  - Discharge to long-term care facility

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Poor Sleep in the Hospital

—Average pt slept **3.75 hours** at night, awake for >50% of time during night

— Sleep was fragmented in short intervals

—5 - 38min

—13 - 26 awakenings/night (mean = 13)

—Noise levels in the hospitals can be ***higher than a jack hammer*** at change of shift.

—The first few hours of sleep are the most restorative.

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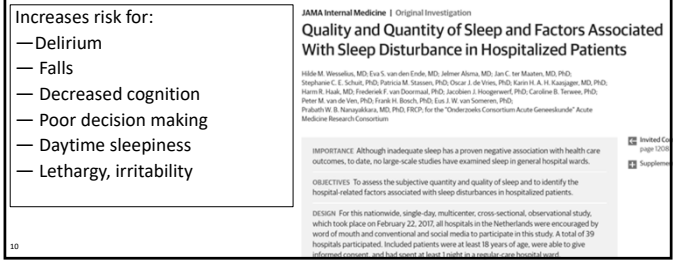
Literature Review

Sleep Deprivation

Increases risk for:
—Delirium
— Falls
— Decreased cognition
— Poor decision making
— Daytime sleepiness
— Lethargy, irritability



JAMA Internal Medicine | Original Investigation

Quality and Quantity of Sleep and Factors Associated With Sleep Disturbance in Hospitalized Patients

Hilde M. Wesselius, MD; Eva S. van den Ende, MD; Jelmer Alsma, MD; Jan C. ter Maaten, MD, PhD; Stephanie C. E. Schuit, PhD; Patricia M. Stassen, PhD; Oscar J. de Vries, PhD; Karin H. A. H. Kaanjager, MD, PhD; Harm R. Haak, MD; Frederiek F. van Doormaal, PhD; Jacobien J. Hoogerwerf, PhD; Caroline B. Terwee, PhD; Peter M. van de Ven, PhD; Frank H. Bosch, PhD; Evs J. W. van Someren, PhD; Prabath W. B. Nanayakkara, MD, PhD; FRCP; for the "Onderzoeks Consortium Acute Geneeskunde" Acute Medicine Research Consortium

IMPORTANCE Although inadequate sleep has a proven negative association with health care outcomes, to date, no large-scale studies have examined sleep in general hospital wards.

OBJECTIVES To assess the subjective quantity and quality of sleep and to identify the hospital-related factors associated with sleep disturbances in hospitalized patients.

DESIGN For this nationwide, single-day, multicenter, cross-sectional, observational study, which took place on February 22, 2017, all hospitals in the Netherlands were encouraged by word of mouth and conventional and social media to participate in this study. A total of 39 hospitals participated. Included patients were at least 18 years of age, were able to give informed consent, and had spent at least 1 night in a regular care hospital ward.

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Literature Review

Approaches to Sleep Promotion:

- Noise reduction (alarms on machines, ear plugs)
- Appropriate lighting
- Patient comfort (pt position, pain relief, oral care, massage)
- Clustering patient care activities

Gilsenan, 2017; Wilson, 2017; Eliassen & Hopstock, 2011; Gellerstedt, 2015; Scotto, 2009; Jarman, 2002; Nagel, 2003

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Methodology

Clinical Question: What is the impact of a sleep program on delirium and costs?

Clinical Framework: Iowa EBP Model and Rapid Cycle (PDSA)

Goal: To create a period of uninterrupted sleep to reduce the development of inpatient delirium.

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Methodology: Measures

- Process Measures:
  - Average number of individual and total interruptions from:
    - Lab draws
    - Medications
    - Bladder scan
    - Blood glucose
- Outcomes Measures:
  - Rate of provider-coded diagnosis of delirium or encephalopathy on discharge
  - Patient experience "Quietness at Night" Top Box score
  - Rate of patients screened positive for risk of delirium by nursing screening (NuDESC)
  - Cost reduction

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Sleep Promotion Team

- Interprofessional
- Provider and other team leaders
- Nursing Leadership: Unit manager and supervisor
- Nurses & Support staff represented by:
  - Shifts
  - Roles

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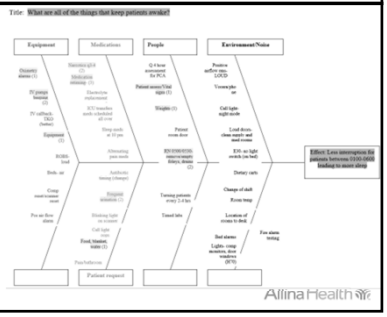
Process

5 Why's Exercise with frontline staff to identify the most common reasons that wake patients up:

- Medications
- Lab draws
- Routine weights
- Alarms
- Bathroom Needs



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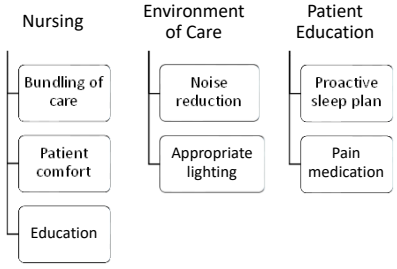
No Wake Zone Interventions



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No Wake Zone Initiative

- Timeframe for No Wake is from **0100 – 0600**
- Utilize for medically stable patients
  - Wake patient when medically indicated (antibiotics, pain medications, change in vital signs)
  - Continue to check on patient at least every 2 hours (respiratory check/safety check)
- Provider and nurse to identify patients
- Provider or nurse to enter order (No Wake Zone)
- Tested on two units: surgical spine and medical oncology

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Suggested Patient Populations to Consider (Not all inclusive)

Appropriate patients to consider	Patients who may not be appropriate
▪ After 1st hospital night ▪ Stable post-operative patients ▪ Stable vital signs (not requiring q 4 hr or more frequent checks) ▪ Patients waiting for nursing home placement ▪ Night before discharge	▪ Surgical patients for first 24 hours ▪ Required vital sign checks q 4 hr or more frequent (i.e. neutropenic fever, PCA — may need 4am VS check, but can give a 4 hour block of time) ▪ Patients on insulin drip (Endo tool) or MINDS protocol

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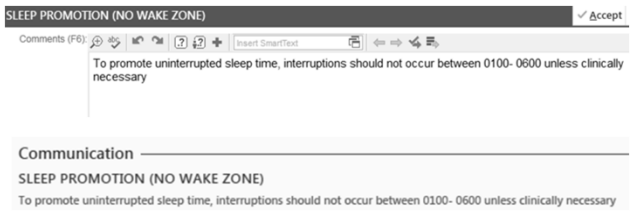
Excellian Order for No Wake Zone

Search under "Sleep" or No Wake Zone



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No Wake Zone Project Work

NURSING LEADER

- Identify area where sleep promotion supplies will be kept
- Identify process for restocking sleep supplies
- Identify with team members loud night-time disruptions (e.g. doors that close loudly)

NURSE

- Prioritize which patients to assess to allow for No Wake Zone
- Enter No Wake Zone order in Excellian
- Educate patient on No Wake Zone and provide sleep menu items

PROVIDER

- Identify which patients are appropriate for No Wake Zone
- Enter No Wake Zone order in Excellian
- Identify if patient still needs oxygen, IV fluids, etc

PHARMACIST

- Review patient's MAR and retime medications as appropriate when consulted

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No Wake Zone Toolkit

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NO WAKE ZONE: PATIENT SLEEP MENU

☐ear plugs	☐adjustments to the room temperature
☐eye mask	☐adjustments to the lighting
☐lavender essential oil	☐opening or closing the shades
☐water	☐opening or closing the door
☐blanket	☐TV
☐warm tea	☐music
☐hand, foot, or back rub	☐relaxing imagery

☐sound machine or cell phone app "white noise" example: or

- Leader checklist
- Staff education (nursing, non-nursing teams, providers)
- Responsibilities by shift
- Templates for Staff Communications
- Weekly & monthly draft updates
- Patient Education
- Signs

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No Wake Zone -Pilot Success

DELIRIUM OUTCOMES 2018: ANW PILOT UNITS

Units	Baseline	2018 YTD	Decrease
E3000	26.31%	17.38%	33%
H7000	14.05%	7.74%	45%

HCACHPS QUIETNESS AT NIGHT: H7000 & E3000 COMBINED

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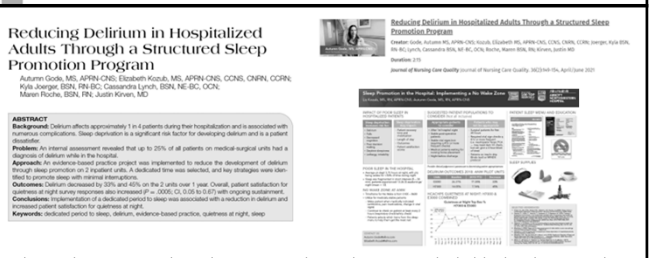
Dissemination- Poster, Publication, and Video



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Spreading NWZ Across Allina (2019)

- Nurse Executive approval for implementation
- NWZ Toolkit development
  - Education/Introduction to nurse leaders
  - Education for Providers
- Added NWZ order into admission and specialty Order Sets

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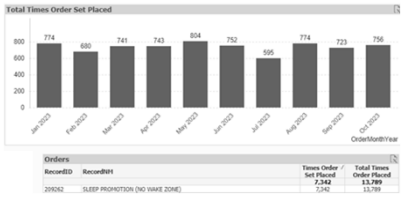
No Wake Zone Order- 2023

The No Wake Zone order has been placed over 13,789 times at Allina Health from January 2023 through October 2023.☆



Orders			
RecordID	RecordNM	Times Order Set Placed	Total Times Order Placed
		7,342	13,789
209262	SLEEP PROMOTION (NO WAKE ZONE)	7,342	13,789

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Delirium Prevention Timeline

- 2017-2018
  - Development of NWZ by interdisciplinary group of nursing, lab, providers, pharmacy, and CNSs
  - First NWZ pilot started on 2 units
- 2019
  - MINDS EBP Program (Neuro Unit)
  - Spread No Wake Zone to all Allina sites
- 2020
  - Delirium Prevention and Sleep Promotion Procedure (Sept 2020)
  - Order Sets
- 2021
  - Delirium Prevention Education Module (system-wide, Fall 2021)
- 2023
  - EBP Fellowship in progress in telemetry

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Delirium Prevention in the Inpatient Neuroscience Population EBP Project

St. Catherine University

EBP Scholar Team

Becky Wenthold, DNP Student
Katie Hedquist, Neuro Floor RN
Liz Kozub, Clinical Mentor, CNS
Patricia Finch Guthrie, Faculty
Brenda Hall, DNP Student
Teresa Cyrus, DNP Student
Lisa Tu, Neuro Floor RN
Jean Omodt, Faculty, *Not Pictured*

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EBP Methodology

Purpose:
To increase staff knowledge and confidence in implementing multicomponent interventions to prevent delirium. To assess if the use of volunteers will reduce delirium incidence.

Primary PICO question:
What is the effect of utilizing volunteers to help assist nurses in implementing a multicomponent intervention on delirium incidence on an inpatient neuroscience unit compared to the incidence rate prior to the implementing the intervention?

Secondary Question:
Does an education program on delirium increase staff knowledge and confidence in preventing delirium?

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Intervention: Staff Education

Offered 18 RN education sessions on delirium

- 80% of regularly scheduled RN's attended
- 47 RNs completed pre- and post- education tests
- Provided shoulder to shoulder teaching to NA/LPN

Promoted current programs to decrease delirium

- No Wake Zone (Sleep promotion)
- Patient Partners (Retired volunteer health care workers)
- Worked with unit medical director to encourage team approach

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Staff Education: Identify Delirium Risk Factors

Prevention Strategy: C.O.N.F.U.S.E.D.

- **C**ognition maintenance (Orientation and sensory stimulation)
- **O**ngoing pain and comfort measures
- **N**ormalize abnormal findings (pain, vital signs, electrolytes, blood glucose)
- **F**amiliar objects and people (friends and family involvement)
- **U**p and out of bed (mobilization and ambulation)
- **S**leep promotion (healthy sleep/wake cycle)
- **E**nvironment (noise level, room temperature, lighting, music)
- **D**iet and digestion (nutrition/hydration and constipation/urinary retention)

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Intervention: Activities and Tools

Increased available activities and tools on unit to promote EBP interventions

- Cognitive stimulating activities, as well as amplifiers, magnifying glasses, etc.
- Patient and family education

Cyrus, T., Wenthold, R., Hall, B., Tu, L., Hedquist, K., Omodt, J., ... Guthrie, P. F. (2021). Effectiveness of a Delirium Prevention Initiative on an Inpatient Neuroscience Unit. *Journal of Neuroscience Nursing*, 53(2), 75–80. https://doi.org/10.1097/JNN.0000000000000580

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Intervention: Use of Volunteers

Meeting the Inpatient Needs for Delirium (M.I.N.D.)

- Developed new volunteer- based program specific on delirium prevention
- Training focused on delirium-prevention interventions
- Volunteers would routinely visit patients who are identified as high-risk for developing delirium and assist unit staff by participating in therapeutic activities with the patients

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Results - Education Session

- Nursing Confidence Increased in Identifying Delirium on Post-Survey ($p < 0.0005$)
- Nurses rated preventing delirium as important on pre-test and there was not a statistical difference on post-test ($p = .317$)
- Nurses believed delirium screening to be part of their role on pretest and there was not a statistical difference on post-test ($p = .680$)
- Nursing knowledge increased after the education session, when compared to pretest ($p < .0005$)

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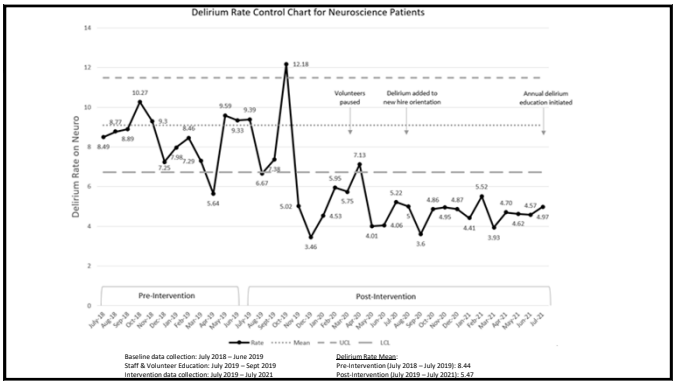

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In Progress: Delirium Prevention Work in Telemetry

Delirium Prevention EBP Clinical Scholars Program: 2 clinical RNs and 3 DNP students mentored by a CNS

Goal: reduce delirium on telemetry units by identifying patients at high risk of developing delirium and providing resources to implement prevention measures

Interventions:

Delirium education for nurses	Patient and care circle education and resources	Supplies for sleep promotion

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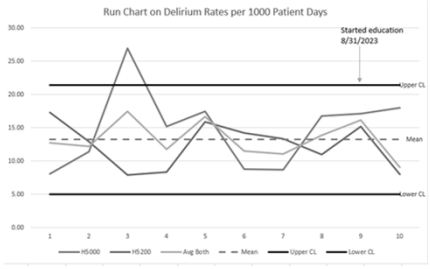
Delirium Prevention in Telemetry Results



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Summary

Progress is stepwise and takes time!

Overall awareness of delirium has increased by RNs, NAs, and Providers

NWZ Order in Excellian helped with implementation and sustainment

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Questions

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