Effect of a Multicomponent Non-Pharmacological Strategy for Delirium Prevention in
Hospitalized Older Adults

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Abstract

**Purpose of Project:** Delirium is a common preventable iatrogenic complication in older adults. The purpose of this quality improvement project (QI) was to evaluate the efficacy of a multicomponent non-pharmacological strategy in reducing delirium incidence in hospitalized older adults.

**Methodology:** This project used a quantitative method design with retrospective and prospective chart reviews. The 2-week multicomponent non-pharmacological delirium prevention strategy for patients 65-100 years old was implemented in the orthopedic unit. Delirium incidence rates were compared before and after intervention.

**Results:** Four RNs and 291 chart reviews (123 pre-intervention and 168 post-intervention) were included in the study. 50% of RN participants worked in the orthopedic unit between two to five years. All RN participants were in between 25-34 years old.

Of the 123 charts reviewed during pre-intervention, 48.8% were ages 65-74, 24.4% were ages 75-84, and 26.8% were ages 85-100. Of the 168 charts reviewed during post-intervention, 61.3% were ages 65-74, 19.0% were ages 75-84, and 19.6% were ages 85-100.

The delirium incidence rate decreased from 14.63% at pre-intervention to 5.95% at post-intervention.

Results of this project support that a multicomponent non-pharmacological strategy is an effective method for delirium prevention in hospitalized older adults. Pre and post-test results from study participants support the need for delirium education for nursing staff.

**Implications for Practice:** Delirium in older adults is preventable through a multicomponent non-pharmacological strategy.
Introduction

Delirium is a common iatrogenic complication in hospitalized older adults that can be prevented by a multicomponent non-pharmacological strategy (American Geriatrics Society [AGS], 2015; Grealish et al., 2019). Delirium is also referred to as acute brain failure and is defined as a neuropsychiatric disorder with an onset of hours to days, characterized by an acute change in cognition, attentional deficit, change in circadian rhythm, emotional dysfunction, and change in psychomotor function (Maldonado, 2017). The different subtypes of delirium are hyperactive, hypoactive, and mixed. Hyperactive delirium involves agitation and increased motor activity, hypoactive delirium presents as lethargy, and mixed subtype involves fluctuations of both hyperactive and hypoactive presentation (Tullman et al., 2016).

Delirium

The etiology of delirium is multifactorial and results from the interaction between predisposing and precipitating factors (Inouye, 2018). Predisposing factors include normal age-related changes such as diminished physiological reserve increasing susceptibility to stressors that accompany hospitalization (Maldonado, 2017). Other predisposing factors are cognitive changes, sensory impairment, multiple comorbidities (Inouye, 2018). These predisposing factors are more common in older adults increasing their risk for delirium development (Inouye, 2018). Precipitating factors for delirium during a hospital admission include immobility, potentially inappropriate medications (PIMs), iatrogenesis, and comorbid illness (AGS, 2019; Inouye, 2018).

Multicomponent Non-Pharmacological Strategy

A multicomponent non-pharmacological strategy can help delirium in hospitalized older adults (AGS, 2015; Grealish et al., 2019; Tullman et al., 2016). This includes interventions such
as frequent reorientation, therapeutic activities, non-pharmacological sleep-enhancement, early-mobilization, providing vision and hearing aids, and preventing dehydration (Inouye et al., 1999).

**Background and Significance**

Delirium can have a long-lasting emotional, social, and financial impact on older adults and their families (Tullman et al., 2016; Weir & O’Brien, 2018; Day & Higgins, 2015). Older adults who recover from delirium describe the experience as overwhelming confusion, lack of autonomy, disturbing perception changes, and overall emotional distress (Weir & O’Brien, 2018). In addition, families may feel helpless when faced with the sudden and unpredictable changes associated with delirium (Weir & O’Brien, 2018). Delirium in older adults can lead to adverse outcomes such as increased length of stay and increased rates of discharges to nursing home or long-term facilities (Tullman et al., 2016). Other long-term effects of delirium include increased rates of depression, functional and cognitive decline, and mortality (Tullman et al., 2016).

**Delirium Prevention**

According to the AGS, there is currently not enough evidence to support a pharmacological strategy such as antipsychotic use for delirium prevention (2015). Current recommendations support a multicomponent non-pharmacological intervention as safe and effective for delirium prevention (AGS, 2015).

Inouye et al., (1999) first identified that delirium is preventable through a multicomponent intervention strategy, the Elder Life Program, which targeted risk factors for delirium development including immobility, cognitive impairment, sleep disturbance, hearing and vision impairment, and dehydration (Inouye et al., 1999). Interventions included frequent
reorientation, therapeutic activities, non-pharmacological sleep-enhancement, early-mobilization, vision and hearing aids, and preventing dehydration (Inouye et al., 1999).

Inouye et al. used the Confusion Assessment Method (CAM) criteria to measure delirium development and showed a decrease in delirium incidence compared to the usual care group (1999). Although the Elder Life Program is effective in preventing delirium, once delirium develops these interventions had little effect on reducing the severity or recurrence (Inouye et al., 1999; Inouye et al., 2015).

**Needs Assessment**

**Global and National Context**

According to the World Health Organization one in five people will be 60 years old and older by the year 2050 (2017). Healthcare providers should be prepared to meet the unique needs of older adults (2017). About 40% of all hospital admissions nationwide are older adults and between 11% to 42% of hospitalized older adults will develop delirium (Mattison, 2019; Tullman et al., 2016). Delirium is the most common complication that occurs postoperatively in older adults and up to 40% of these cases are preventable by using a multicomponent non-pharmacological strategy (AGS, 2015).

**State and Local Context**

The overall delirium incidence at this hospital in 2019 was 11.3%, of which 62.7% were older adults. The site currently has a delirium screening and treatment protocol but does not have a delirium prevention protocol as part of the hospital policy.
Environmental Scan

An analysis using the Strengths, Weaknesses, Opportunities and Threats (SWOT) model was conducted at this site. The SWOT analysis supported the need for a delirium prevention strategy.

**Strengths**

The site was a Magnet hospital dedicated to improving patient outcomes including reducing delirium incidence. The site was also a member of the program, Nurses Improving Care for the Healthsystem Elder (NICHE), which provided a foundation for organizational improvement in the care of the hospitalized older adult (New York University, n.d.). Nursing leadership and administration supported research and quality improvement projects about improving patient outcomes. The site also had a multidisciplinary geriatric care team and steering committee tasked with improving the care of older adults.

**Weaknesses**

The site did not have a geriatrician involved in the geriatric care team or steering committee. Other weaknesses included fewer geriatric care team members at the unit where implementation took place compared to other units.

**Opportunities**

The site was part of a larger hospital system with a comprehensive geriatric care program including delirium management as one of the priorities. For example, one hospital successfully integrated the Elder Life Program for delirium prevention. Additionally, there were several geriatricians across the hospital system available to consult with regarding delirium prevention.

**Threats**
Threats to a delirium prevention strategy included the hospital system’s standardized delirium order set and interdisciplinary plan of care (IPOC) which was initiated for delirium treatment instead of prevention. An anticipated threat to implementation was that the multidisciplinary team could view the multicomponent non-pharmacological strategy for delirium prevention as time consuming.

**Purpose Statement**

Delirium occurs commonly in hospitalized older adults but is preventable through a multicomponent non-pharmacological strategy (Inouye et al., 2015). Delirium leads to adverse outcomes including partial to no recovery, increased institutionalization, and increased mortality (Tullman et al., 2016; Weir & O’Brien, 2018; Day & Higgins, 2015). Primary prevention is necessary because once delirium develops both pharmacological and non-pharmacological interventions have shown little to no effect or insufficient evidence to support reducing delirium episode length or severity (Inouye et al., 2015). The purpose of this quality improvement project was to address the need for delirium prevention in hospitalized older adults by implementing a multicomponent non-pharmacological strategy.

**Clinical Question**

Does the implementation of a multicomponent non-pharmacological strategy in an orthopedic unit reduce delirium incidence in hospitalized older adults compared to usual care?

**Aims and Objectives**

This project aimed to reduce delirium incidence in older adult patients, age 65 years to 100, admitted in an orthopedic unit in a 300-bed urban hospital in Hudson County. The primary endpoint was a reduction in delirium incidence.

Objectives:
• Create an informational flyer about delirium pathophysiology, incidence and prevalence, risk factors, and multicomponent non-pharmacological prevention by August 2020.

• Identify at least ten nurses in the orthopedic unit willing to attend educational sessions about the multicomponent non-pharmacological strategy for delirium prevention by September 2020.

• Identify a data analyst to partner with to collect data about delirium incidence using ICD-10 codes (F01.5-F05, F43, F44.89, E05.1-E0591, R41.81, F03.9, F03.91, G81.83 + F02.8, G81.83 + F02.81, G20 + F02.81, R41, F13.921, F44.89, F13.231) by September 2020.

• Collaborate with the data analyst partner to identify delirium incidence using ICD-10 codes for delirium in the orthopedic unit for 2019 to determine pre intervention baseline by September 2020.

• Design a bedside audit tool with the multicomponent non-pharmacological strategy as items to check by September 2020.

• Identify all older adult patients in the orthopedic unit visually in the unit white board assignment by underlining the room number in purple dry erase marker to contrast with younger adult patients written in black dry erase marker every shift during the one-month implementation period.

• Implement the multicomponent non-pharmacological strategy for all older adults admitted to the orthopedic unit during the one month of implementation by using the existing delirium interdisciplinary plan of care (IPOC) for delirium positive
patients and using this for prevention instead of treatment measured by daily random chart audits, one per day during the one-month implementation period.

- Perform random bedside audit, one patient per weekday, with the bedside audit tool screening for the interventions in the multicomponent non-pharmacological strategy during the one month of implementation.

- Collaborate with the data analyst partner to identify delirium incidence using ICD-10 codes for delirium in the orthopedic unit during the one month of intervention implementation to determine post intervention effectiveness by December 2020

- Create a survey for evaluation of the overall project to be completed by participants and key stakeholders by October 2020

- Administer project evaluation to participants and key stakeholders after implementation by December 2020

**Review of Literature**

**Search Strategy**

A comprehensive electronic database search was conducted in CINAHL (EBSCOhost) PubMed, and the George F. Smith Library using the search terms “delirium”, “prevention”, and “older adult” or “adult” including related terms: “elderly”, “seniors”, or “geriatrics”.

Additionally, reference lists of full text review articles were screened for relevant titles. All articles were title screened for relevance to the clinical question. Of those included in the title screen, a review of the abstract was conducted prior to full text review.

Inclusion criteria included research articles available in English published from 2015 to 2020 to reflect the most current literature. This timeframe was also chosen to reflect studies done
after the AGS released the most current guidelines about postoperative delirium prevention that indicated a need for more research prior to using pharmacologic strategies routinely for delirium prevention (2015). The topic focus was delirium prevention in the adult or older adult in an acute care setting. Exclusion criteria included non-English articles, study protocols, practice journals, non-research journals, studies in pediatric populations, and studies about delirium in a home or long-term care setting. Most studies found were experimental or quasi-experimental. Refer to Appendix B for Table of Evidence.

**PRISMA Process**

The literature search was conducted using the PRISMA process of identification, screening, establishing eligibility, and final inclusion (2009). The database search yielded 2,518 results with an additional 10 results from reference list screening of full text review articles for a total of 2,618 records. After duplicates were removed, 2,558 remained. Of these, 356 were title screened and 48 did not meet the inclusion criteria and were excluded from review of abstract. After reading the abstracts, 35 met inclusion criteria. After full-text review, 23 were excluded with reasons and 12 studies were included in the final review for synthesis. Of these studies, three were systematic reviews and meta-analysis, six were randomized clinical trials (RCTs), and three were quasi-experimental. Refer to Appendix A for the PRISMA flow diagram (2009).

**Evidence**

**Key Concepts**

For the purposes of this project, delirium will not be measured by one specific tool but instead is defined as an acute onset of confusion or acute change in cognition, attentional deficit, change in circadian rhythm, emotional dysfunction, and change in psychomotor function (Inouye, 2018; Maldonado, 2017). Delirium prevention is defined as a decrease in delirium
incidence, measured by a previously validated delirium screening tool, when an intervention other than usual care is implemented (Campbell, 2019; Jaiswal et al., 2018; Schrijver et al., 2017; Neufeld et al., 2016; Bannon et al., 2018; Karadas & Ozdemir, 2016; Munro et al., 2017; Johnson, Fleury & McClain, 2018; Potharajaroen et al., 2017; Guo & Fan, 2016; Chen et al., 2017; Martinez et al., 2015). Pharmacological strategy is defined as one or more pharmacological agents used as prophylaxis for delirium (Campbell, 2019; Jaiswal et al., 2018; Schrijver et al., 2017; Neufeld et al., 2016). Non-pharmacological strategy is defined as any one intervention without a drug component used as prophylaxis for delirium (Bannon et al., 2018; Karadas & Ozdemir, 2016; Munro et al., 2017; Johnson, Fleury & McClain, 2018; Potharajaroen et al., 2017). A multicomponent non-pharmacological strategy is defined as more than one non-drug component used as prophylaxis for delirium (Guo & Fan, 2016; Chen et al., 2017; Martinez et al., 2015).

**Epidemiology**

The highest rate of delirium incidence occurs in the older adult subjected to increased physiological stress in acute care settings (Campbell et al., 2019; Karadas & Ozdemir, 2016; Potharajaroen et al., 2017). Delirium occurs in about one third of all older adults in different settings with increasing incidence in surgical and intensive care units (ICUs) (Potharajaroen et al., 2017). About 20% of older adults present to the emergency room with delirium (Karadas & Ozdemir, 2016). In the general medicine population, delirium incidence is between 11% to 14% and this number increases in the postsurgical population (Campbell et al., 2019). Of older adults in postoperative units, delirium incidence in those admitted for hip fracture surgery is between 37% to 51% (Schrijver et al., 2017). The highest rates of delirium are found in the hospitalized older adult with increasing incidence in illness severity and mechanical ventilation (Jaiswal et
Risk factors for delirium are multifactorial and includes predisposing factors such as increased age, increased illness severity, cognitive impairment immobility, and precipitating factors often found in a hospital environment such as sleep cycle alterations, and sensory alteration (Jaiswal et al., 2018; Munro et al., 2017; Karadas & Ozdemir, 2016). Studies support a reduction in physiological reserve increases the risk for delirium development in the older adult (Johnson, Fleury, & McClain, 2018; Jaiswal et al., 2018). Increased illness severity with infection, malnutrition, fluid and electrolyte imbalances, and chronic illnesses are also delirium risk factors (Chen et al., 2017; Johnson, Fleury, & McClain, 2018). Cognitive impairment caused by dementia and other neurological conditions such as stroke is a predisposing risk factor for delirium and these conditions often result in impaired mobility which is also an independent delirium risk factor (Jaiswal et al., 2018; Karadas & Ozdemir, 2016). Several studies identified sleep cycle disturbances and sleep fragmentation, commonly occurring in a hospital environment, as a risk factor for delirium (Campbell et al., 2019; Jaiswal et al., 2016; Munro et al., 2017; Martinez et al., 2015; Potharajaroen et al., 2017; Johnson, Fleury, & McClain, 2018). Sensory deprivation or overstimulation from the hospital environment can also precipitate delirium particularly in those with cognitive impairment (Jaiswal et al., 2018; Munro et al., 2017). These predisposing and precipitating risk factors should be considered for effective delirium prevention.
**Delirium Prevention**

To target one or more delirium risk factors, several interventions for delirium prevention have been studied including pharmacological, non-pharmacological, and multicomponent non-pharmacological strategies. Pharmacological strategies included interventions with melatonin and melatonin receptor-agonists, haloperidol, and other antipsychotics (Neufeld et al., 2016; Campbell et al., 2019; Jaiswal et al., 2018; Schrijver et al., 2017). Non-pharmacological strategies included interventions with range of motion (ROM) exercise, frequent reorientation, listening to music, and bright light therapy (BLT) (Potharajaroen et al., 2017; Karadas & Ozdemir, 2016; Munro et al., 2017; Johnson, Fleury, & McClain, 2018). Multicomponent non-pharmacological strategies included a combination of interventions, most commonly with reorientation, cognitive stimulation, mobilization, and prevention of sleep-cycle disturbances (Guo & Fan, 2016; Chen et al., 2017; Martinez et al., 2015).

**Pharmacological Delirium Prevention.** Studies show mixed results for decreasing delirium incidence using pharmacological strategies and they are currently not recommended for routine use in delirium prevention in the hospitalized adult or older adult population (Campbell, 2019; Jaiswal et al., 2018; Schrijver et al., 2017; Neufeld et al., 2016). A systematic review and meta-analysis of the role of antipsychotics in delirium prevention found no statistically significant ($p = 0.19$) association between prophylactic antipsychotics and delirium incidence in the adult inpatient population (Neufeld et al., 2016). Individual study findings of melatonin and ramelteon, a melatonin receptor agonist, show conflicting results (Campbell et al., 2019; Jaiswal et al., 2018). A study examining the efficacy of Haloperidol did not show a decrease in delirium incidence in hospitalized older adults (Schrijver et al., 2017). The two most common types of drug classes used were antipsychotics and melatonin receptor agonists.
Further research is needed prior to using antipsychotics to prevent delirium in the adult inpatient (Neufeld et al., 2016; Schrijver et al., 2017). A systematic review and meta-analysis of randomized controlled trials (RCTs) and quasi-experimental studies of delirium prevention in acute care areas examined the use of the following antipsychotics: haloperidol, olanzapine, risperidone, and quetiapine (Neufeld et al., 2016). In addition to the lack of efficacy in reducing delirium incidence in the intervention groups, a meta-analysis found no statistically significant (p = 0.17) association in reducing short-term mortality secondary to delirium or reduction of delirium duration (Neufeld et al., 2016). Limitations of this systematic review include the differences between studies such as setting, age of participants, different drugs used, and different drug dosages and routes (Neufeld et al., 2016). A double blind RCT of Haloperidol one milligram taken by mouth was conducted in patients age 70 and older admitted to general medicine and surgical units (Schrijver et al., 2017). The results show a non-significant (p = 0.302) increase of delirium incidence in the intervention group compared to the placebo group. Additional findings showed no effect for mortality secondary to delirium and hospital length of stay (Schrijver et al., 2017). There is currently not enough evidence to support the use of antipsychotics in preventing delirium in the adult acute care population (Neufeld et al., 2016; Schrijver et al., 2017).

Further research is needed prior to routine use of melatonin and melatonin receptor agonists to prevent delirium in the older adult inpatient (Campbell et al., 2019; Jaiswal et al., 2018). A systematic review and meta-analysis of melatonin and ramelteon in the adult perioperative population showed a statistically significant (p = 0.006) reduction in delirium incidence when compared to the placebo group (Campbell et al., 2019). However, the doses ranged from three milligrams to five milligrams indicating the need for more research to
determine a specific dose (Campbell et al., 2019). One RCT examined administration of melatonin three milligrams in older adults ages 65 to 99 admitted to a general medicine, non-ICU setting showed no statistically significant (p = 0.14) decrease in delirium incidence compared to the placebo group (Jaiswal et al., 2018). Additional findings showed no improvement in participants’ self-reported sleep quality in the melatonin group (Jaiswal et al., 2018). Mixed results indicate a possible role for melatonin in regulating sleep cycle and reducing sleep fragmentation, however more research is needed at this time to support this (Campbell et al., 2019; Jaiswal et al., 2018).

**Non-pharmacological Delirium Prevention.** Studies show mixed results for individual non-pharmacological strategies indicating a need for more research or combining interventions for greater efficacy in decreasing delirium incidence in the hospitalized adult and older adult population (Bannon et al., 2018; Karadas & Ozdemir, 2016; Munro et al., 2017; Johnson, Fleury & McClain, 2018; Potharajroen et al., 2017). Individual RCTs examined range of motion (ROM) exercise, reorientation, music listening, and bright light therapy targeting one risk factor for delirium.

A study using ROM exercise to target immobility, a known risk factor for delirium, was conducted in older adult age 65 and older admitted to the ICU (Karadas & Ozdemir, 2016). ROM in all four extremities was given to non-mechanically ventilated patients for 30 minutes daily and showed no statistically significant (p > 0.05) reduction delirium incidence compared to usual care (Karadas & Ozdemir, 2016). This study shows that ROM as a single intervention does not effectively decrease delirium in this patient population and would likely be more useful if combined with other non-pharmacological strategies trialed in the ICU population (Karadas & Ozdemir, 2016).
Another intervention studied in the ICU population is the use of BLT in surgical ICU patients age 50 and older (Potharajaroen et al., 2017). BLT using a light source positioned at the foot of the patient’s bed and used for a specified time during daytime hours showed a statistically significant \( p < 0.04 \) reduction in delirium incidence compared to usual care (Potharajaroen et al., 2017). BLT addresses disturbances in sleep wake cycles common in the ICU population and can be considered as an intervention in non-pharmacological delirium prevention strategies (Potharajaroen et al., 2017).

Other interventions included listening to music and recorded messages to reduce delirium incidence in the ICU setting (Munro et al., 2017; Johnson, Fleury, & McClain, 2018). In the trauma and orthopedic ICU population, music therapy showed no difference in delirium incidence in the intervention group compared to usual care (Johnson, Fleury, & McClain, 2018). However, secondary outcomes showed a statistically significant \( p = 0.001 \) reduction in heart rate pre and post listening to slow music in the intervention group (Johnson, Fleury, & McClain, 2018). Another intervention targeted reorientation by using recorded messages by a family member compared to the same message recorded by an unknown voice with a control group receiving usual care (Munro et al., 2017). Study findings showed a statistically significant \( p = 0.04 \) difference in delirium free days for the family voice group compared both the unknown voice group and usual care group (Munro et al., 2017). These studies support the role of interventions such as reorientation and therapeutic music listening as part of a non-pharmacological strategy in delirium prevention (Munro et al., 2017; Johnson, Fleury, & McClain, 2018).

A systematic review and meta-analysis of non-pharmacological interventions in adults admitted to ICU and acute care settings showed insufficient support for these interventions when
used individually (Bannon et al., 2018). Mixed results of interventions such as BLT, family voice reorientation, and physical therapy indicate the need to address multiple risk factors associated with delirium such as a multicomponent non-pharmacological strategy (Bannon et al., 2018).

**Multicomponent Non-pharmacological Delirium Prevention.** Delirium etiology is multifactorial and the safest and most efficient method for reducing delirium incidence is by targeting multiple risk factors through a multicomponent non-pharmacological delirium prevention strategy (Guo & Fan, 2016; Chen et al., 2017; Martinez et al., 2015). A meta-analysis of multicomponent strategies using daily reorientation, family care involvement, sensory stimulation, family and staff education, and mobilization in patients age 60 and older admitted in acute care settings showed a statistically significant ($p < 0.001$) reduction in delirium incidence (Martinez et al., 2015). Individual studies to support this include studies using nursing staff education, cognitive stimulation, providing an environment of care, social support, and preventing sleep disruption (Guo & Fan, 2016). The results of this study were statistically significant ($p < 0.01$) compared to usual care. Another study modified the Hospital Elder Life Program (mHELP) using reorientation, preventing malnutrition, and promoting early mobility and found a statistically significant ($p = 0.04$) reduction in delirium incidence compared to usual care (Chen et al., 2017). Although these findings are clinically significant, research gaps were identified in this review of literature. Knowing the epidemiology, risk factors, and effective strategies for delirium prevention, a specific population requiring more research is in older adults admitted to an orthopedic postoperative unit. Few studies were done about this population who are at an increased risk for delirium (Neufeld et al., 2016; Guo & Fan, 2016).
Summary

It is evident that delirium incidence is increased in the hospitalized older adult because of the predisposing and precipitating risk factors present in this population combined with the acute care environment (Campbell et al., 2019; Karadas & Ozdemir, 2016; Potharajaroen et al., 2017). Risk factors include older age, severe illness, cognitive impairment immobility, sensory alteration, and sleep cycle disruption (Jaiswal et al., 2018; Munro et al., 2017; Karadas & Ozdemir, 2016). Addressing these risk factors are necessary for delirium prevention.

The strategies used to prevent delirium are pharmacological, non-pharmacological, and multicomponent non-pharmacological. Pharmacological and non-pharmacological strategies showed mixed results (Campbell et al., 2019; Jaiswal et al., 2018; Neufeld et al., 2016; Bannon et al., 2018; Karadas & Ozdemir, 2016; Munro et al., 2017; Johnson, Fleury & McClain, 2018; Potharajaroen et al., 2017). However, when non-pharmacological interventions were combined into a multicomponent strategy results showed a reduction in delirium incidence in the hospitalized adult patient (Chen et al., 2017; Martinez et al., 2015; Guo & Fan, 2016). To address this gap, non-pharmacological interventions will be combined into a multicomponent strategy for reducing delirium incidence in the hospitalized older adult admitted to an orthopedic unit.

Theoretical Framework

Lewin’s Planned Change Theory

The theoretical framework used to guide the implementation of this project is Lewin’s Theory of Planned Change (TPC) with three main components of unfreezing, moving or transitioning, and refreezing (Shirey, 2013). Kurt Lewin was a prominent figure in social psychology and was well known for the TPC (Shirey, 2013). Lewin’s Resolving social conflicts; Field theory in social science addresses the need to change the organization’s or group’s
structure first for any change process to become successful (1997). One of the underlying concepts in this theory is the interrelationship between a group and their environment and identification of driving and restraining forces that need to be addressed to change a behavior in an individual, a group, or an organization (Shirey, 2013). Addressing the driving and restraining forces in the implementation site will help facilitate the change process in this top-down model (Shirey, 2013). Specific stages of Lewin’s TPC, unfreezing, moving or transitioning, and refreezing, was used to guide the process of implementing a multicomponent non-pharmacological strategy for delirium prevention. See Appendix C for a model of Lewin’s Planned Change Theory.

**Unfreezing**

Recognizing the need for change and knowing that there is a gap between literature and current practice are crucial first steps in Unfreezing, the first stage in Lewin’s TPC (Shirey, 2013). Prior to initiating change, the reason why change is needed must be apparent not only to key stakeholders for success (Shirey, 2013). A needs assessment for the site implementation was conducted followed by a comprehensive review of literature to establish the need for change and to support it with evidence. There was a lack of delirium prevention measures at the implementation site although current guidelines support that preventing delirium in the older adult is a priority (AGS, 2015) and is more effective than treatment of delirium (Inouye, 2015).

Planning and development are the next steps in the Unfreezing stage. After identifying the need to change delirium management, a solution of a multicomponent non-pharmacological strategy was chosen with support from current guidelines and review of literature for delirium prevention in the hospitalized older adult (AGS, 2015; Guo & Fan, 2016; Chen et al., 2017; Martinez et al, 2015).
After developing the project, engaging key stakeholders is the next step in the Unfreezing stage (Shirey, 2013). Planned educational sessions and meetings for nurses, nurse leaders, patient care technicians, physicians and therapists about delirium prevention outlining the multicomponent non-pharmacological strategy will be provided to support driving forces and address potential barriers for change (Shirey, 2013). Unfreezing prepares for change to occur in the Moving or Transitioning stage of Lewin’s TPC (Shirey, 2013).

**Moving or Transitioning**

The process of implementation occurs at the Moving or Transitioning, the second stage in Lewin’s TPC (Shirey, 2013). A step-by-step plan of action were provided to all participants throughout this stage with constant coaching and support available from the principal investigator. This stage was challenging because it required individuals and the organization to not only alter the workflow, but to accept a culture change as well.

Data collection, evaluation of the outcomes, and overall evaluation of the project were the next steps following implementation in the Moving or Transitioning stage, continuing the change process (Shirey, 2013). Determining whether the project was successful in reducing delirium incidence in the older adult will be important for participants and stakeholders to know. An online Likert-Scale survey with a section for free-text comments was given to RN participants to evaluate the overall project including barriers, strengths, weaknesses, feasibility, suggestions, and any other comments, to maintain an open line of communication throughout the Moving or Transitioning stage (Shirey, 2013).

Finally, dissemination of findings was the final step in the Moving or Transitioning stage. Findings will be shared through posters at the institution and at the site implementation, verbal presentations during unit meetings for nursing staff, and PowerPoint presentations at the site
implementation for key stakeholders. Dissemination of findings is important in refocusing on the overall aim (Shirey, 2013) of decreasing delirium incidence in the hospitalized older adult and prepares for the next and last stage in Lewin’s TPC, Refreezing.

**Refreezing**

Sustainability and the stability of change are the main goals in the Refreezing stage (Shirey, 2013). Stabilizing the new culture and workflow will require continued efforts such as changing the current policy to reflect a delirium prevention protocol. A policy change will be proposed to nursing leadership and administration to maintain sustainability (Shirey, 2013). A sustained adaptation of the intervention through policy and culture change signals successful flow through Lewin’s three stages of TPC (Shirey, 2013).

**Methodology**

**Project Design**

This QI project used a quantitative method design with retrospective and prospective chart reviews to examine the delirium incidence after the 2-week multicomponent non-pharmacological delirium prevention strategy in older adults admitted in an orthopedic unit.

**Setting**

The project took place in a 300-bed acute care urban hospital located in Hudson County, New Jersey. Hudson County hospitals served a diverse population of six-hundred thousand people with 11.8% comprised of older adults (United States Census Bureau, 2019). The project was conducted in an orthopedic medical-surgical unit with an admission rate of 31.8% older adults in 2019.

The project site was a Magnet designated hospital with nursing leadership and administration that supported QI projects. Partnership with key stakeholders was maintained
throughout the QI project such as with nursing leaders, data analysts, senior administration, and patient care coordinators. The site Director of Clinical Excellence was part of the DNP team and provided guidance throughout the QI project. The site data analyst worked with the principal investigator to perform chart reviews. Nursing leaders in the orthopedic unit provided support for project activities during implementation.

**Study Population**

The staff participants were the nursing staff in the orthopedic unit including registered nurses (RNs) and patient care technicians (PCTs). A convenience sample was taken from all willing participants. The demographics that were collected from the sample included professional role, years of experience, full-time or part-time status, age, and previous experience or knowledge of project intervention.

Patient participants were from chart review of older adult patients, without patient identifiers, admitted to the orthopedic unit before and after the intervention. Participants for both sample groups will have specific inclusion and exclusion criteria.

**Participant Recruitment**

Recruitment of participants from the nursing staff population was done through informational flyers and electronic mail (e-mail). Following guidelines from the Centers for Disease Control and Prevention (CDC) social distancing practices and universal masking were strictly adhered to when conducting in-person recruitment (2020). Project information were posted at several areas of the orthopedic unit including the announcements board and in the staff lounge. Additionally, e-mails were sent to all orthopedic nursing staff with project information using the site’s organization e-mail. Both the flyer and the e-mail contained the co-investigator’s
contact information and instructions regarding participation in the project. See Appendix D for Recruitment Flyer and Appendix E for e-mail.

Inclusion criteria for nursing staff sample included RN or PCT role, at least part-time status in the orthopedic unit, and at least 6-months of experience in the orthopedic unit. Exclusion criteria included advance practice nurses, per-diem status, orientation status, and float nursing staff.

Pre-intervention retrospective chart review and post-intervention prospective chart review inclusion criteria included age 65 to 100, admitted to orthopedic unit with any length of stay duration. Exclusion criteria included observation status, delirium present on admission, and delirium related to substance use or alcohol withdrawal. Consents were obtained from all willing nursing staff participants meeting inclusion and exclusion criteria.

**Consent Procedure**

Participation in the project was voluntary and a consent form was provided to all willing participants. The consent form included the principal investigator’s information, summary, and purpose of the project. The consent form clearly stated any potential harm, risks, and benefits. The consent stated that participation is voluntary and the alternative to participating is not participating in the project. Other elements in the consent form included the participant’s role, withdrawal process, confidentiality, and contact information for the Institutional Review Board (IRB) (Roush, 2015). Please refer to Appendix F for the consent form.

**Study Risk Harm and Ethics**

The consent form informed participants of any potential benefits, risk, harm and ethical considerations during participation in the project. Nursing staff participants were not anticipated to be exposed to any additional risk and harm outside their usual practice role in the unit during
participation in the QI project. Potential benefits included increased knowledge about delirium prevention and management in the older adult. Participant confidentiality was maintained throughout the entirety of the project including dissemination of project findings. Additionally, charts for chart review were de-identified.

**Study Costs and Compensation**

The budget for project costs and participant compensation was one-hundred dollars. The educational module was provided through the NICHE program. The site was currently a member of NICHE and costs were included and paid for by the nursing administration budget. Participants were offered a randomized chance to win two 25-dollar gift cards that were provided by the principal investigator.

**Economic Considerations**

The one-hour educational module through the NICHE program about delirium in older adults were provided online and participants were given two weeks to complete the module. Participants were able to log in and out during their shift. RNs earned one hour of continuing education credit after completion of the module. See Appendix G for an outline of the RN educational module and Appendix H for the PCT educational module.

Additional costs included support from staff already employed at the site. A data analyst assisted the principal investigator in chart reviews during regular working hours.

**Resources Needed**

Other resources such as space and materials were included as part of the principal investigator’s current role at the project site. The principal investigator had a dedicated office space with available resources for laminating and materials for printing flyers. Other materials
that were needed were already available such as a storage cabinet with lock and key and a secure desktop.

**Study Intervention**

The intervention was composed of an educational module about delirium in older adults followed by implementation of multicomponent non-pharmacological delirium strategy through a change in the workflow process. The educational module was provided by NICHE, a program with a mission of improving older adult care throughout healthcare settings and organizations (NICHE, n.d.). The educational module was provided through the online knowledge platform available for NICHE member organizations to adhere to social distancing practices (CDC, 2020). Each module started with a 10-question pre-test, followed by an estimated one-hour self-paced module with voice over narration, and ended with the same 10-question post-test. Post-test questions were copied to survey monkey to repeat the post-test two weeks after module completion. The educational modules for RNs and PCTs were similar but offered different focus and levels of learning appropriate for each role. This QI project changed the approach to delirium care in the orthopedic unit from delirium treatment to delirium prevention. The existing IPOC for delirium treatment included:

- Check daily CAM and notify MD if positive for the first time
- Ensure patient has in place:
  - Eyeglasses
  - Hearing aids
  - Dentures
- Orient frequently through the shift
- Provide cognitive stimulation
• Provide diversionary materials for patient such as busy apron, activity box, etc.
• Assess for pain a minimum of each shift
• Avoid all physically and chemically restrictive devices
• Provide family with informational material
• Encourage family to be at bedside as often as possible
• Ask family to complete the “About Me” poster
• Turn lights down and close curtains no later than 10 pm, avoid noise/TV after 10 pm
• Move to room with window as soon as possible and open window shades in morning
• Private room preferred
• Get patients OOB for all meals and PRN unless clinically contraindicated

Specific interventions such as family visitation was encouraged either through virtual online visits, phone calls, or in person during visiting hours to adhere to current hospital policy and statewide social distancing measures (CDC, 2020). Refer to Appendix I for the delirium IPOC. Usual care involved using the IPOC for delirium positive patients only, triggered by a positive Confusion Assessment Method tool or a delirium diagnosis. The intervention involved RN participants initiating the IPOC for all older adults admitted to the orthopedic unit during the two-week implementation period. PCT participants implemented appropriate interventions under the guidance of the RN participant. A workflow process flyer was provided to participants. Participants were also given a laminated pocket card to attach to their ID badge for accessibility and reference. See Appendix J and K for workflow flyer and Appendix L and M for pocket card. All project activities adhered to a timeline.
**Project Timeline**

Planning this QI project began January 2020 and continued through implementation and evaluation until December 2020. The planning stage started in January 2020 and continued through August 2020 with key activities such as collecting baseline delirium incidence data, meeting, and discussing with the DNP team and key stakeholders and obtaining the site’s letter of cooperation. The anticipated date for submission to the site IRB was May 2020. Once approved, the project protocol was submitted to Rutgers eIRB for administrative review. The anticipated implementation start date was August 2020 beginning with the pre-intervention retrospective chart review. Participant recruitment was anticipated to begin September 2020 over two weeks. The educational module was anticipated to begin October 2020 with a pre-test and ending with a post-test. The workflow process of the QI project and pocket card was anticipated to be distributed mid-October. Implementation of the intervention over two weeks and ending the implementation week with a participant survey was anticipated to begin end of October 2020. Finally, a prospective chart review was anticipated to be conducted in November 2020. See Appendix N for the planned project timeline.

**Outcomes to be Measured**

Measurable outcomes in this QI project included delirium incidence rates pre- and post-intervention and staff participants’ pre- and post-test scores. Reduction of delirium incidence post intervention was the desired overall outcome.

**Evaluation Plan**

An online survey through Survey Monkey was given to all participants to evaluate the QI project. The survey link was sent to each participant’s work e-mail and participants were instructed to click the link that opened a new window. Instructions were specifically stated to
take the survey one time only. The participants then proceeded to answer demographic questions in multiple-choice format such as professional role, years of experience, age, and previous experience or knowledge of intervention. Subsequent survey questions were in seven-point Likert Scale format with questions such as how likely the participants were to implement the QI project in their current practice. The survey included an open-ended section at the end to allow participants to express any areas of improvement, and project areas that the participant liked or disliked. See Appendix O and P for the survey and e-mail instructions.

Data Analysis Plan

Data analysis of all QI project activities were analyzed through Microsoft Excel. Descriptive statistics reflected demographics of the participants’ age range, years of experience, full-time or part-time status, and experience or no experience with the intervention. Chart review collected frequency counts of IPOC initiation for delirium during admission.

Survey results were reported through descriptive statistics including frequency reports and percentages results provided through Survey Monkey. For open-ended questions in the survey, assessment for common themes were conducted and grouped into themes.

Data Maintenance and Security

Data was maintained and securely stored with careful consideration of protection of participants’ privacy and confidentiality. Consents, chart reviews, survey results, and pre- and post-tests were stored electronically in a password protected desktop in an office requiring employee card access at the project site. Only the co-investigator had access to the desktop and the password will not be shared. Participants’ privacy and confidentiality was protected by
removing names from pre- and post-test results. To correlate the correct post-test with the correct participant’s pre-test, an identifier such as “RN1” and “PCT1” was assigned prior to starting the modules and was documented in a separate paper log. The paper log was kept in a locked file cabinet in the co-investigator’s office space with only the co-investigator having access and knowledge of the key’s location. The paper log was destroyed in a shredder box immediately after the identifiers are correlated with the post-test. Patient charts did not have protected health information collected and only collected the following information: age, admitting diagnosis, exposure to intervention, delirium development, and IPOC initiation. Chart reviews, survey results, and pre-test and post-test results were deleted electronically after evaluation of the QI project.

**Results**

Results include description of final sample, older adult admission rate in the orthopedic unit, delirium education results, delirium incidence rate results, and project evaluation results.

**Response Rate**

Participant recruitment flyers were sent out to 34 RNs and 19 PCTs. Over the course of a two-week recruitment period, 7 RNs and 1 PCT signed consent for study participation. Surveys were distributed to participants before and immediately after the education module. We also distributed surveys to participants two weeks after the education module to see if learning was sustained. Three of the pre-tests were not completed and were dropped from final analysis. The response rate for RN pre-test, post-test and 2-weeks follow up after intervention was 57.14%. The PCT participant completed the pre-test but did not complete post-test and follow up test.

**Final Sample Size**
The final staff participants was 4 RNs. The final sample size for charts reviewed for pre-intervention data was 123 and for post-intervention data was 168.

**Participant Demographics**

Participant demographic data was collected during the final project evaluation. All staff participants in the final sample were RNs. Half of the participants were employed in the orthopedic unit between two to five years, one was employed one to two years, and one was employed greater than five years. All participants had previous exposure to the NICHE program prior to the study intervention. All participants were in the age group 25-34 years old.

**Patient Chart Review Demographics**

Two weeks of pre-intervention chart data was collected from November 11, 2020 to November 15, 2020. The total number of patients admitted were 511 with 123 older adult patient charts that met inclusion and exclusion criteria. Of the 123 charts reviewed, 48.8% were between the ages 65 to 74, 24.4% were between the ages 75-84, and 26.8% were between the ages 85 and 100.

Two weeks of post-intervention chart data was collected from December 1, 2020 to December 15, 2020. The total number of patients admitted were 428 with 168 older adult patient charts that met inclusion and exclusion criteria. Of the 168 charts reviewed, 61.3% were between the ages 65 to 74, 19.0% were between the ages 75-84, and 19.6% were between the ages 85 and 100.

**Delirium Education Test Results**

The average pre-test score of delirium education test was 70. The average post-test score was 92.5. The average score after 2-week follow up was 93.5. See Appendix Q for RN Delirium Post-test.
Delirium Incidence Rate

During the pre-intervention period, a total of 123 older adult patient charts reviewed met inclusion and exclusion criteria. Zero patient charts were excluded for delirium present on admission. Eighteen patient charts showed delirium development during inpatient stay. Five patient charts showed new delirium superimposed on dementia. The delirium incidence rate during the pre-intervention period was 14.63%.

During the post-intervention period, a total of 179 older adult patient charts were reviewed and 168 met inclusion and exclusion criteria. Eleven patient charts were excluded for delirium present on admission. Ten patient charts showed delirium development during inpatient stay. Three patient charts showed new delirium superimposed on dementia. The delirium incidence rate during the post-intervention period was 5.95%. See Appendix R for Pre-Intervention Data, Appendix S for Post-Intervention Data, and Appendix T for Delirium Incidence Rates.

Delirium IPOC

During the pre-intervention period, 4 Delirium IPOCs were initiated. During the post-intervention period, 67 older adult patients were assigned to an RN study participant and 69 Delirium IPOCs were initiated.

Project Evaluation

Staff participants were given an evaluation survey after the two-week implementation period. Half of all participants were “very satisfied” with project activities, one was “satisfied”, and one was “neither satisfied nor dissatisfied”. One participant was “very satisfied” with the educational module, and 75% were “satisfied”. All participants reported they are “very likely” to use delirium prevention strategies in practice (Appendix P).
We also asked staff participants “Overall, what could have been done differently to improve the study?” “What did you like best about the study?” and “What did you like least?”. Some participant’s answers were “It is an aggressive approach to increase the chances that pts who are delirious will be flagged sooner to prevent delays in care” and another answered, “I liked the modules on delirium because of the information I can use to implement interventions in practice”.

Common themes emerged from the open-ended questions. Staff participants suggested that more participants could have improved the study results. Participants liked the shift from delirium treatment focus to delirium prevention with non-pharmacological interventions. Some participants reported insufficient time to assess patient’s needs due to workload assignment.

**Discussion of Findings**

Delirium is a common iatrogenic complication in hospitalized older adults that occurs from a combination of predisposing and precipitating risk factors (Inouye, 2018). Delirium is associated with adverse outcomes such as increased length of stay, irreversible functional and cognitive decline, and increased mortality rates (Tullman et al., 2016). The cause of delirium is multifactorial and a targeted approach is needed to address predisposing factors such as increased age, increased acuity of illness, and cognitive impairment (Jaiswal et al., 2018; Munro et al., 2017; Karadas & Ozdemir, 2016). Precipitating risk factors such as sleep cycle disturbance and sensory deprivation should be prevented (Jaiswal et al., 2018; Munro et al., 2017; Karadas & Ozdemir, 2016).

According to the review of literature and AGS guidelines, multicomponent non-pharmacological strategies are a safe and effective method for delirium prevention in hospitalized older adults (AGS, 2015; Chen et al., 2017; Martinez et al., 2015; Guo & Fan, 2016).
2016). This QI project addressed the need for a delirium prevention in hospitalized older adults by implementing a multicomponent non-pharmacological strategy.

**Key Findings**

The key findings included a reduction in delirium incidence rates in hospitalized older adults after implementing a multicomponent non-pharmacological strategy for delirium prevention. Additional findings included an increase mean score in delirium knowledge from the pre-test to the immediate post-test and sustained knowledge retainment in the second post-test two weeks after the educational module was completed.

**Need for Nursing Staff Delirium Education**

The study findings add support to the literature that nursing staff education is an important foundation in reducing delirium in older adults (Martinez et al., 2015; Guo & Fan, 2016). Participants found the delirium education helpful not only during the study intervention period but found it helpful to use in their daily patient care as well.

**Need for Delirium Prevention Measures**

Studies show that the safest and most efficient method for delirium prevention is through the combination of non-pharmacological interventions targeted at predisposing and precipitating delirium risk factors (Guo & Fan, 2016; Chen et al., 2017; Martinez et al., 2015). Study findings bridge the gap in literature for delirium prevention in older adults admitted to an orthopedic unit. Study findings support the need for a multicomponent non-pharmacological strategy for delirium prevention. The results support the need for a policy change from delirium treatment to prevention focused care.

**Project Objectives Evaluation**
Most project objectives were only partially met. Flyers for participant recruitment were distributed successfully and at least ten RNs in the orthopedic unit verbalized interest in participating in the study, however only seven RNs signed consent, and three did not complete the pre-test. A data analyst was available to partner with for demographic data collection but was delayed significantly in providing pre-intervention delirium incidence rate data. The data analyst was not able to fully provide pre- and post-intervention data. The study coordinator collected individual chart review data. In consideration of social distancing practices, the study coordinator limited the time spent in-person on the orthopedic unit and performed chart reviews electronically instead of in-person at the bedside.

Major objectives such as adhering to the workflow process specified on participant badge cards were successfully met during two weeks of intervention implementation. Project evaluation by study participants were successfully completed through online surveys.

**Key Facilitators**

The key facilitating factor to successfully meeting most project objectives was continuous support from nursing leadership at the project site. Open line of communication to nursing leaders such as directors of nursing and senior director of research helped facilitate site IRB approval. The director of nursing of the orthopedic unit helped arrange meetings to inform nursing staff about project activities and encouraged participation. One RN on the orthopedic unit helped recruit participants by announcing key project activities during shift huddle for one week.

**Key Barriers**

The key barrier to project implementation was the COVID-19 pandemic which limited project activities in several ways. Because of increasing numbers of daily cases in New Jersey
during November to December 2020, the focus of daily hospital operations shifted back to COVID-19 care (New Jersey Department of Health, 2020). Nursing staff cited increasing acuity in the orthopedic unit and declined participation in the study. In-person recruitment was limited to avoid large gatherings. Social isolation, universal masking, and proper protective equipment (PPE) such as masks, gowns, and face shields may have increased the risk for delirium in hospitalized older adults (Garcez, 2020). Limited visiting hours is a barrier for encouragement of family involvement in care, an important part of the multicomponent non-pharmacological strategy. Another key barrier to implementation was project timeline delays while awaiting IRB approval. This process delayed project implementation by 2 months.

**Unintended Consequences**

Unintended consequences included one RN taking a leadership role in the orthopedic unit to lead other NICHE program activities. Another unintended consequence was the creation of a new reporting tool in the organization’s electronic health record to run a daily census report by unit. This reporting tool was not previously available and was created at the request of the study coordinator to aid in project activities. This daily reporting census tool also benefited nursing leaders in performing routine chart audits.

**Process Evaluation**

The process evaluation included a survey for participants to evaluate the project.

**Implications and Recommendations**

This QI project will have several implications including clinical practice, policy changes, healthcare quality and safety, education, and economics.
**Clinical Practice**

The findings combined with the review of literature findings, support the need for delirium prevention in hospitalized older adults. Current practice at the project site was treatment focused. RNs screened for delirium and initiated the delirium IPOC only for CAM-positive patients. However, anticipated findings support evidence-based practice recommendations to routinely screen for delirium while simultaneously implementing non-pharmacological strategies to prevent delirium (Blevins, 2020; Chen et al., 2017; Martinez et al., 2015; Guo & Fan, 2016). Based on the results and recommendations from the AGS, it is recommended for RNs to use non-pharmacological strategies to prevent delirium and incorporate this as part of routine care for older adult patients (AGS, 2015; Blevins, 2020).

**Healthcare Policy**

This QI project supports a policy shift from delirium treatment to primary prevention measures with a multicomponent non-pharmacological strategy. The recommended protocol for delirium prevention includes assessment for risk factors, routine screening using a validated tool, and minimizing precipitating risk factors by using non-pharmacological strategies (Blevins, 2020). The results combined with recommended best-practice protocols support a change in policy to initiate the delirium IPOC for every older adult admitted to an inpatient unit at the project site (AGS, 2015; Blevins, 2020).

**Quality and Safety**

The impact for healthcare quality and safety will be meeting a larger goal of becoming an Age-Friendly Health System as outlined by the Institute for Healthcare Improvement by focusing on the prevention of delirium and other common geriatric syndromes (2019). The results support
the need to continue monitoring for delirium. Delirium incidence rates are suggested to become a quality-of-care measure at the project site (Blevins, 2020).

**Education**

The pre and post-test results from study participants support the need for delirium education for nursing staff. Several studies included delirium education as a foundation for delirium prevention (Guo et al., 2016; Chen et al., 2017; Martinez et al., 2015). Healthcare organizations should consider incorporating geriatric-focused education during orientation and annually for nursing staff because our population is aging worldwide (Blevins, 2020; WHO, 2017).

**Economic**

Economic impact includes a potential reduction in hospital length of stay due to a reduction in adverse outcomes associated with delirium (Inouye, 2018; Chen et al., 2017). There are several adverse outcomes associated with delirium development including increased hospital length of stay, complicated hospital course, and increased risk for requiring critical care (Blevins, 2020). All these adverse outcomes increase the economic burden. The average length of stay (ALOS) for older adults in the orthopedic unit in 2019 was 5.13 days compared to younger adults ages 18 to 64 with ALOS of 4.78. The ALOS for the hospital in 2019 was 5.93 for older adults and 4.76 in younger adults. The results combined with support from literature support delirium prevention strategies to reduce the economic burden of increased hospital LOS from adverse outcomes of delirium (Blevins, 2020).
Orthopedic Unit

Results support NICHE program implementation for the orthopedic unit. The NICHE program will guide staff education and unit-improvement activities related to geriatric care such as delirium prevention measures (NICHE, n.d.).

Plans for Sustainability and Translation

Refreezing the change by addressing sustainability and translation to practice will be through policy change and incorporation of the educational modules during orientation (Shirey, 2013). A policy change that reflects delirium prevention through a multicomponent non-pharmacological strategy will help ensure sustainability and broader application of this QI project. Incorporating the educational modules for delirium management in the older adult during RN and PCT orientation to all appropriate units admitting older adult patients will aid in bridging delirium knowledge gaps (Grealish et al., 2019). Supporting staff at the bedside will also help in maintaining the culture change (Shirey, 2013). The orthopedic unit will become a NICHE unit in 2021.

Plans for Dissemination and Professional Reporting

Dissemination of project findings will be presented through a paper, poster, and a formal presentation. The final paper will be submitted to appropriate professional journals such as the American Geriatrics Society for peer-review. This QI project will also be presented at the NICHE annual conference and NICHE monthly webinars. The poster will be presented at the University’s poster day. Another poster will be developed using the project site’s template and presented during the project site’s research poster day. The final presentation will be a formal PowerPoint presentation at the University and at the project site, including the orthopedic unit. Dissemination of information and professional reporting will help ensure sustainability and
translation to a broader group for practice implementation of a multicomponent non-pharmacological strategy for delirium prevention in older adults.

**Plans for Future Scholarship**

Plans for future scholarship include project continuation by interdisciplinary teams. An ongoing study at the project site is a branch off this QI project. The ongoing study is a pharmacist-led intervention to screen for PIMs. The primary endpoint is a reduction in delirium incidence in inpatient older adults.

**Summary**

Delirium is a common and preventable iatrogenic complication in hospitalized older adults that results from the interaction between predisposing and precipitating risk factors. Delirium can be preventable by recognizing and mitigating these risk factors in hospitalized older adults. The results of this QI project support that a multicomponent non-pharmacological strategy is an effective method for delirium prevention in hospitalized older adults. The results of this QI project support the need for integration of geriatric programs such as NICHE for systematic improvement in healthcare organizations.
References


the American Geriatrics Society. *Journal of the American College of Surgeons*, 220(2).
doi: 10.1016/j.jamcollsurg.2014.10.019


Appendix A

PRISMA 2009 Flow Diagram

Records identified through database searching (n = 2,518)

Additional records identified through other sources (n = 10)

Records after duplicates removed (n = 2,558)

Records screened (n = 356)

Records excluded (n = 48)

Full-text articles assessed for eligibility (n = 35)

Full-text articles excluded, with reasons (n = 23)

Studies included in qualitative synthesis (n = 12)
EBP Question: Does the implementation of a multicomponent non-pharmacological strategy in an orthopedic unit reduce delirium incidence in hospitalized older adults compared to usual care?

Date: March 5, 2020

<table>
<thead>
<tr>
<th>Article</th>
<th>Author, Date</th>
<th>Evidence Type</th>
<th>Sample, Sample Size, Setting</th>
<th>Study Findings that help answer EBP question</th>
<th>Limitations</th>
<th>Evidence Level &amp; Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>Campbell, A. M., Axon, D. R., Martin, J. R., Slack, M. K., Mollon, L., &amp; Lee, J. K. (2019)</td>
<td>Systematic review and Meta-analysis</td>
<td>Perioperative hospitalized patients with a mean age of 50 years of in each study included. 6 studies included for systematic review and meta-analysis.</td>
<td>In older adults undergoing surgery, the odds of delirium development in patients who received perioperative melatonin were 37% less (p = 0.006) than patients who received placebo or no treatment. The dose of melatonin (low 3mg versus high 5mg) remains unanswered and is implication for future study. This study supports the need for sleep-wake cycle regulation for reduction in delirium incidence.</td>
<td>There is only a small body of literature available for the prevention of delirium with melatonin (n = 335) and only 6 met inclusion criteria for this systematic review and meta-analysis. The dosage of melatonin remains unanswered after this systematic review.</td>
<td>Research Level I, B, good quality</td>
</tr>
<tr>
<td>#2</td>
<td>Schrijver, E. J. M., Vries, O. J. D., Ven, P. M. V. D., Bet, P. M., Kamper, A. M., Diepeveen, S. H. A., … Nanayakkara, P. W. B. (2017)</td>
<td>Double-blind, randomized controlled clinical trial</td>
<td>At risk, acutely ill older adults admitted for general medicine or surgical intervention N = 242 Patients age 70 and older, multicentre</td>
<td>Haloperidol in acutely ill admitted older adults did not show reduction of delirium incidence compared to the control group. The haloperidol group had a delirium incidence of 19.5% versus 14. % in the control group (p = 0.302). Haloperidol had no effect for clinical outcomes of mortality and hospital length of stay. This study provides support for refraining from haloperidol use for delirium prevention in the acutely ill admitted older adult.</td>
<td>Limitations include a smaller sample size not meeting the intended sample size of n = 390. Other limitations include missing data for objective delirium screening tools and having to use clinical observation instead clinical observations combined with the screening tool which may diminish the accuracy of the results.</td>
<td>Research Level I, C, low quality</td>
</tr>
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| #3 | Jaiswal, S. J., Mccarthy, T. J., Wineinger, N. E., Kang, D. Y., Song, J., Garcia, S., … Owens, R. L. (2018) | Randomized clinical trial | Internal medicine, non-intensive care units N =69, inpatients with expected length of stay >48 hours, age 65 to 99 years old n = 36 in melatonin group | Melatonin 3mg in older adults admitted in non-intensive care units did not show a statistically significant (p = 0.14) reduction in delirium incidence when compared to the placebo control group. An unexpected finding showed a non-significant (p = 0.19) increase in delirium incidence with 15% Confusion Assessment Method (CAM) positive in the melatonin group and 9.1% delirium incidence in the placebo group. Mixed results indicate need for further research before using melatonin to prevent delirium in the hospitalized older adult. | Limitations include single center instead of multi-center trial. The CAM tool was used to measure delirium incidence instead of a neuropsychiatric evaluation and diagnosis of delirium. Interrater reliability was not assessed. | Research Level I, B, good quality |
| #4   | Karadas, C., & Ozdemir, L. (2016) | Randomized Clinical Trial | Intensive care units (ICU)  
N = 94 patients in the ICU with non-invasive mechanical ventilation  
age 65 and older  
n = 47 in intervention group  
n = 47 in control group | Additional findings showed a statistically non-significant association with decreased sleep duration and delirium incidence (p = 0.17). Melatonin 3 mg did not improve subjective or objective sleep measures. Sleep fragmentation in this patient population requires further study.  
Range of motion (ROM) exercise in patients age 65 and older in the ICU who do not have invasive mechanical ventilation did not show a statistically significant (p > 0.05) reduction in delirium incidence (intervention 8.5%, control 21.3%).  
This study supports the need for a multicomponent compared to one intervention only such as ROM exercise in delirium prevention in the older adult. | Limitations include limited generalizability to hospitalized older adults because the patient sample consisted of medical ICU non-ventilated patients with a smaller sample size of N = 94, although it was still adequately powered. | Research Level I, B, good quality |
| #5 | Munro, C. L., Cairns, P., Ji, M., Calero, K., Anderson, W. M., & Liang, Z. (2017) | Pilot randomized controlled trial | N = 30 ICU patients, ages 18 and older  
   n = 10 family voice group  
   n = 10 unknown voice group  
   n = 10 control group | Automated re-orientation through recorded voice messages were given to ICU inpatients age 19 to 92 years old. The participants were randomly selected for the recorded message to be given by family, unfamiliar voice, and no automated reorientation. The primary outcome was delirium free days. There was a statistically significant (p = 0.0437) difference for delirium free days among the three groups. | Limitations include insufficient sample size requiring a larger randomized controlled trial. Additionally, subgroup analysis was not conducted. Some patients in the intervention group did not receive the intervention because of clinical improvement and discharge from the ICU. | Research Level I, C, poor quality |
| #6 | Johnson, K., Fleury, J., & Mcclain, D. (2018) | Randomized control trial | N = 40 patients in the trauma ICU and trauma orthopedic unit age 55 years and older  
   n = music listening group  
   n = usual care group | Music listening as an intervention for delirium prevention in the trauma ICU and orthopedic unit showed no development of delirium as measured by the Confusion Assessment Method for both the intervention group with music listening and the control group of usual care. Secondary outcomes included statistically significant differences in HR (p = 0.001), and systolic blood pressure (p = 0.003) pre and post music listening for the music intervention group. This study supports a non-pharmacological approach to delirium prevention such as music | Limitations include exclusion of mechanically ventilated patients from the study and patients with high levels of anxiety despite sedation and pharmacological treatment. Additionally, the researcher was not blinded to the intervention or the control group creating a potential for observer bias. | Research Level I, B, good quality |
 n = 30 bright light therapy  
 n = 31 usual care | The effect of bright light therapy on delirium prevention showed a statistically significant (p < 0.047) reduction on delirium incidence in SICU patients age 50 years of older when compared to usual care.  
 The findings support a non-pharmacological therapy for bright light normalizing the sleep-wake cycle for the critically ill older adult inpatient. | Limitations include limited generalizability to hospitalized older adults. Criteria for study excluded Alzheimer’s dementia and Parkinson’s dementia patients. Other limitations include single blinding only as the primary researcher and the patients had knowledge of group assignment and only the primary assessor for delirium, the senior ICU physician, was blinded to group allocation. | Research Level I, B, good quality |
| #8 | Guo, Y., & Fan, Y. (2016) | Controlled clinical trial | N = 122 intensive care unit patients, mean age of 54 in the intervention group and 52 | A multicomponent non-pharmacological intervention protocol was examined for delirium prevention effectiveness in postoperative patients in the ICU. The interventions included nursing staff education, systematic | Limitations include a small sample size, single-center, non-randomized, and non-blinded trial. | Research Level II, B, good quality |
| #9 | Neufeld, K. J., Yue, J., Robinson, T. N., Inouye, S. K., & Needham, D. M. (2016) | Systematic review and meta-analysis | N = 1970 participants from 19 studies, RCTs, observational, case-control, cohort | No statistically significant (p = 0.19) associated between antipsychotic use and delirium prevention was found in the older adult patient. Additionally, antipsychotics were not associated with a reduction in short-term mortality, reduction of delirium episode (p = 0.17), and ICU (p = 0.20) or hospital length of stay (p = 0.89).

This systematic review and meta-analysis support the need for further research about antipsychotic use for delirium prevention. | Limitations include heterogeneity of studies, heterogeneity of study populations ranging from intensive care to general medical surgical. | Research Level I, B, good quality |

|  |  |  |  |  |  |  |

in the usual care group
n = 59 intervention group
n = 63 usual care group
cognitive caring, and maintaining a safe environment. The intervention group showed a statistically significant (p < 0.01) reduction in signs of delirium measured by the Delirium Detection Score (DDS) when compared to usual care.

This study supports effective delirium prevention through a targeted multicomponent non-pharmacological approach.
- n = 197 patients mHELP  
- n = 180 patients usual care  

The modified Hospital Elder Life (mHELP) consisting of three nursing protocols: orienting communication, assistance with oral intake and nutrition needs, and early mobility, showed a statistically significant (p = 0.008) reduction in delirium incidence in the postoperative abdominal surgery older adult patient with shorter length of stay (p = 0.04) compared to the usual care group.  

Limitations include a cluster randomization design instead of randomization. The study was adequately powered for delirium and length of stay outcome analysis but was underpowered for subgroup analysis. Additionally, contamination of care could have occurred through care by the same team of nurses and surgeons even when not assigned to the control group of mHELP specific protocol.  

Research Level I, B, good quality |
| #11 | Martinez, F., Tobar, C., & Hill, N. (2015) | Systematic review and meta-analysis | N = 1691 participants from 7 included studies, age > 60 and older  

The multicomponent non-pharmacological interventions in this systematic review and meta-analysis includes daily reorientation, involvement of the family in care, sensory deprivation avoidance, and educating the staff and the family. The most used interventions were mobilization by physical and occupational therapy, daily reorientation, and avoiding sensory deprivation.  

Limitations include limited explanation on how to implement the interventions, inability to conduct sub-analyses for each intervention in a multicomponent strategy because of the small number of trials.  

Research Level I, A, high quality |
Multicomponent interventions showed a statistically significant (p < 0.001) reduction in delirium incidence and accidental falls (p = 0.003) in older adults admitted to acute care settings.

Adult inpatient units including ICU, medical, surgical | Meta-analysis of bright light therapy showed no statistically significant (p = 0.19) reduction in delirium incidence, multicomponent physical therapy showed no statistically significant (p = 0.42) reduction in delirium episode length. Family voice reorientation showed a statistically significant (p = 0.003) reduction in delirium incidence.

Mixed results show insufficient support for individual interventions in delirium prevention and indicates a need for more research on multicomponent non-pharmacological interventions. | Limitations include heterogeneity of studies, settings, populations, and interventions. Even when the interventions were the similar, the duration or intensity of the intervention varied. | Research Level I, B, good quality |
Appendix C

Lewin’s Theory of Planned of Change

Unfreeze

- Gap analysis
- Recognize for change
- Needs assessment
- Planning and developing project proposal
- Engaging key stakeholders with educational sessions

Change

- Implementation of intervention
- Data collection
- Evaluation of project outcomes
- Overall evaluation of project
- Dissemination of findings

Refreeze

- Stabilize the change
- Policy change
- Culture change
- Sustainability
Appendix D

Participant Recruitment Flyer

A Multicomponent Non-Pharmacological Strategy Quality Improvement Project for Delirium Prevention in Hospitalized Older Adults

What: Participant Recruitment for Quality Improvement Project
- Participation in this project is voluntary
- A quality improvement project to reduce delirium incidence in the older adult patient admitted in 6 West
- Project activities:
  - Participants will be enrolled in a 1-hour delirium educational online module through the NICHE knowledge center
  - Participants will have 2 weeks to complete the self-paced module with a pre-test and post-test, results will be confidential
  - Participants will implement a multicomponent non-pharmacological strategy to prevent delirium using the existing Delirium IPOC for all patients admitted to 6 West, age 65 and older, during the 2-week implementation period
  - Participants will take an online survey through Survey monkey at the end of the implementation period to evaluate the project, results will be confidential
  - RNs will receive 1 hour of continuing education credit after module completion
  - Participants will be entered for a chance to win two 25$ T.J.MAXX stores gift card with the submission of the project evaluation survey

Where: Orthopedic / Med-Surg Unit

Who: Registered Nurses and Patient Care Technicians
- Full-time or Part-time status on
- At least 6 months of experience on
- All shifts eligible

When: Educational module through the NICHE Knowledge Center will begin October 1, 2020. Project activities will continue until October 31, 2020

How: Volunteer to participate in Quality Improvement project
- September 21, 2020- September 25, 2020 from 8:00am-8:30am in the Conference room- Reading and voluntary signing of informed consent to participate

Questions? Contact: Janielle Viuya, BSN, RN, RN-BC, GRN
Project Co-investigator, DNP Student / Geriatric Nurse Coordinator
- e-mail:  
- cell:  

Approved for departmental posting by: Post date: Remove date:
Electronic Mail Participant Recruitment

To: Registered Nurses; Patient Care Technicians
Cc: Director of Nursing; Director of Clinical Excellence; Patient Care Coordinators

From: Janielle Viuya, Geriatric Nurse Coordinator

Subject: Participant Recruitment for Delirium Prevention Quality Improvement Project

Attached: Recruitmentflyer.doc

Hello Nursing team,

My name is Janielle Viuya, Geriatric Nurse Coordinator at and DNP student at Rutgers School of Nursing. I am the co-investigator for a quality improvement project that will be conducted in this Fall 2020. Attached is a flyer for participant recruitment for this project. Below my signature is a summary of the content.

The flyer will be posted various areas of including the bulletin board and the staff lounge and will be printed and stored in the patient care coordinator’s office space for those without access to e-mail.

Please don’t hesitate to reach out to me via e-mail or cellphone for any questions you may have regarding the project. I am looking forward to working with you and your team!

Best regards,

Janielle Viuya, BSN, RN, RN-BC, GRN
Geriatric Nurse Coordinator
Summary:

**What:** Participant Recruitment for Quality Improvement Project

- Participation in this project is voluntary
- A quality improvement project to reduce delirium incidence in the older adult patient admitted in
- Project activities:
  - Participants will be enrolled in a 1-hour delirium educational online module through the NICHE knowledge center
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WIRB RESEARCH SUBJECT INFORMATION AND CONSENT FORM

TITLE: Effect of a Multicomponent Non-Pharmacological Strategy for Delirium Prevention in Hospitalized Older Adults

PROTOCOL NO.: Sponsor: WIRB® Protocol #

SPONSOR: None

INVESTIGATOR: Janielle Viuya

PHONE NUMBER: Janielle Viuya

SUMMARY

You are being asked to be in a research study. The purpose of this consent form is to help you decide if you want to be in the research study. You should not join this research study until all of your questions are answered.

Things to know before deciding to take part in a research study:

- The main goal of a research study is to learn things to help patients in the future.
- The main goal of regular medical care is to help each patient.
- The decision to join or not join the research study will not affect your employment in any way. Joining the research study is not a requirement of your professional role in this organization.
- Parts of this study may involve standard medical care. Standard care is the treatment normally given for a certain condition or illness.
- Other parts of this study may involve experimental procedures and protocols that are being tested for a certain condition or illness.
- After reading the consent form and having a discussion with the research staff, you should know which parts of the study are experimental and which are standard patient care.

PURPOSE OF THE STUDY

The purpose of this quality improvement project is to find an effective way to prevent delirium in older adults admitted to . This will be done by using a multicomponent strategy without pharmacological agents. Currently, non-pharmacological interventions are used to treat patients who develop delirium during their hospital stay. The experimental component will be using these strategies to prevent delirium occurrence in older adults and will be trialed in , orthopedic medical-surgical unit.
PROCEDURES

The project will be done using the following methods:

- Participants will be enrolled in a one-hour educational module about delirium care in the older adult
  - This module will be completed online through the NICHE (Nurses Improving Care for the Healthsystem Elder) Knowledge Center
  - Participants will be able to log in and out of the module at any time and the content will automatically resume
  - Participants will have two weeks to complete this module
  - There will be a 10-question pre-test and post-test
  - The post-test will be repeated one more time two weeks after completion of the module
- Participants will be given a new workflow process (this will be the experimental portion of the project) to follow for two weeks
  - The new workflow process for using multicomponent non-pharmacological strategies to prevent delirium will be followed every time the participant works on:
    - For Registered Nurses: The delirium CAM-positive IPOC will be initiated on all patients 65 and older admitted to:
      - The interventions listed in the IPOC will be implemented during the entirety of the shift
    - For patient care technicians:
      - In partnership with the RN, the interventions in the IPOC will be followed during the entirety of the shift
      - If the RN assigned to a patient you are caring for is not a participant of the study, consult with the RN assigned to your patient if okay to perform delirium prevention measures
  - All participants will be given a guideline in flyer format as well as a laminated pocket card, quick reference guide to attach on to the ID badge for easy and convenient reference
- Charts of older adult patients without patient health information and patient identifiers will be collected pre and post intervention to compare delirium rates
- A short survey to evaluate the project overall will be given electronically through Survey Monkey to each participant at the end of the study
- Participants will be recruited through convenience sampling. Random sampling and assignment will not be used
  - This means that all willing RNs and PCTs that meet criteria for participation in this study will be able to participate and will all be assigned to one group receiving the same treatment
RISKS AND DISCOMFORTS

Participants are not anticipated to be exposed to any additional risk and harm outside usual practice role in the unit during participation in this project.

Other Risks

The additional one-hour required to complete the educational module may be a challenge to complete during working shift hours over a two-week period. The participant may want to complete the educational module at home instead to minimize interruptions in completing the module. If this is the case, the time spent at home completing the module will not be paid as an additional working hour.

NEW INFORMATION

You will be told about any new information that might change your decision to be in this study. You may be asked to sign a new consent form if this occurs.

BENEFITS

Potential benefits in participating in this study are new knowledge about delirium, principles of care for the older adult patient, and staff and patient safety measures during a hyperactive delirium episode.

COSTS

The participant will not pay anything and will not be billed any amount for participating in this study.

PAYMENT FOR PARTICIPATION

You will not be paid for being in this study. However, participants will be entered into a raffle for a chance to win two $25 T.J. MAXX gift cards at the end of the study. Two participants will be randomly selected after completion of a survey.
RNs will receive one hour of continuing education credit for completion of the module.

**ALTERNATIVE TREATMENT**

This is not a treatment study. Your alternative is not to be in this study.

**Confidentiality**

Information from this study will be given to the research team. Your answers to tests and survey questions will be confidential and will be known only by the research team. When study data will be reported, your names will not appear anywhere on the results. Your personal information collected will not be given to any

The results of this research study may be presented at meetings or in publications. Your identity will not be disclosed in those presentations.

**COMPENSATION FOR INJURY**

If you are injured or get sick as a result of being in this study, follow usual employee injury reporting policy.

**VOLUNTARY PARTICIPATION AND WITHDRAWAL**

Your participation in this study is voluntary. You may decide not to participate or you may leave the study at any time. Your decision will not result in any penalty.

Your participation in this study may be stopped at any time by the research team without your consent for any reason, including:

- if it is in your best interest
- if you do not consent to continue in the study after being told of changes in the research that may affect you

If you leave the study before the project activities end, there will be no follow up needed
SOURCE OF FUNDING FOR THE STUDY

There are no sponsors of this study. Costs related to the study are covered under regular hospital operations. Additional costs such as gift cards are covered by the research team.

QUESTIONS

Contact Janielle Viuya at [redacted] or e-mail at [redacted] for any of the following reasons:

- if you have any questions about your participation in this study,
- if you have questions, concerns or complaints about the research.

If you have questions about your rights as a research subject or if you have questions, concerns or complaints about the research, you may contact:

Western Institutional Review Board® (WIRB®)

1019 39th Avenue SE Suite 120

Puyallup, Washington 98374-2115

Telephone: 1-800-562-4789 or 360-252-2500

E-mail: Help@wirb.com

WIRB is a group of people who independently review research.

WIRB will not be able to answer some study-specific questions, such as questions about appointment times. However, you may contact WIRB if the research staff cannot be reached or if you wish to talk to someone other than the research staff.

Do not sign this consent form unless you have had a chance to ask questions and have gotten satisfactory answers.

If you agree to be in this study, you will receive a signed and dated copy of this consent form for your records.
A description of this clinical trial will be available on http://www.ClinicalTrials.gov, as required by U.S. Law. This Web site will not include information that can identify you. At most, the Web site will include a summary of the results. You can search this Web site at any time.

**CONSENT**

I have read this consent form (or it has been read to me). All my questions about the study and my part in it have been answered. I freely consent to be in this research study.

I authorize the release of my research records for the purpose of this study.

By signing this consent form, I have not given up any of my legal rights.

__________________________________________

Subject Name (printed)

__________________________________________  __________________

Signature of Subject  Date
Appendix G

RN Delirium Education Module

Module Objectives

After completing this module you should be able to:

1. Monitor order status for the signs and symptoms of delirium.
2. Identify those at greatest risk to develop delirium.
3. Intervene and monitor to prevent delirium before it starts.
5. Accurately use delirium screening tool.
6. Use history, physical, and all tests to identify and treat underlying conditions.
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Risk Factors for Delirium

Common Factors

Pre-disposing Factors

- Age greater than 70
- Pre-existing cognitive impairment
- Acute illness
- Operative procedures
- Acute medical problems

Common Factors

Pre-disposing Factors

- Poor functional status
  - Frailty
  - Alcohol abuse
  - Depression
  - Dehydration
  - Sensory impairment
  - Nursing home resident
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Discussion

Scenario: Assessing Delirium Risk

Age: 82 years old.
Situation: Preoperative patient.

History:
- Drove and plays golf.
- Type II Diabetes, Hypertension
- Needs hearing aids and glasses.
- Dehydrated fluids at home.

Lab: Elevated Hct, BUN, and Cr.

Medications: Oral hypoglycemic agents, sodium channel blocker

Identifying Delirium
Prevention:

- Improve or maintain mobility
- Maintaining health routines to promote maintenance of normal sleep-wake cycles
- Reducing interruptions of sleep
- Orientation to surroundings—clocks, calendar, staff introductions
- Family interactive visits
- Familiar objects from home
- Maintaining or improving nutrition and hydration
- Review medications
- Reduce pain or other discomfort

Identify Early Signs of Delirium:

- Observe behavior frequently.
- Screen systematically.
- Report behavior changes early.
- Use clinical history, physical exam and lab tests.
- Identify metabolic disturbances, pain, injury, infection, and acute illnesses.
- Differentiate between delirium, dementia, and depression.
- Communicate.

Barriers to Recognition and Treatment:

- Personal aging philosophies
- Inability to distinguish from dementia
- Hypersensitive delirium
- Time constraints
- Lack of systematic screening
- Low physician support
Assessment Parameters

NICHIE

Underlying Conditions
- Medical history, physical exam, and lab tests to assess
  - Medications
  - Recent injury
  - Chronic conditions
  - Alcohol use
  - Metabolic issues

Discussion
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Scenario: Identify Delirium

Situation: Post-operative patient
Conditions:
- Indwelling catheter and IV
- Missing hearing aids and glasses,
- Does not understand that he has a catheter in place,
- Appears quiet but agitated and
disoriented,
- Sits large birds out the window

Recognizing and Treating Delirium

Comparing Delirium to Dementia
### Comparing Delirium to Dementia (Cont.)

<table>
<thead>
<tr>
<th>NICHE</th>
<th>DELIRIUM</th>
<th>DEMENTIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Judgement</strong></td>
<td>Impaired, difficult distinguishing facts and fiction</td>
<td>Impaired, inappropriate decisions, decreased confidence</td>
</tr>
<tr>
<td><strong>Psychotic Symptoms</strong></td>
<td>Hallucinations</td>
<td>Misinterprets people and events, experiences threatening false delusions, hallucinations</td>
</tr>
<tr>
<td><strong>Level of Consciousness</strong></td>
<td>Delirious</td>
<td>Diffuse</td>
</tr>
<tr>
<td><strong>Recent Memory</strong></td>
<td>Impaired, but remote memory is intact</td>
<td>Short-term memory deficit in early course, progresses to significant deficits, confusion, delusion</td>
</tr>
</tbody>
</table>

### Complex Clinical Presentations

- **SUDDEN DECELERATION IN STATUS**
  - Delirium on top of Dementia Diagnosis

- **DEPRESSION**
  - Rubaye: hyperactive delirium

- **PsYCHOSIS**
  - Rubaye: delirium

  - Psychotic illness involves auditory hallucinations and elaborate delusions.

### Delirium Treatment Strategies

1. **Step One**
   - Identify during assessment
2. **Step Two**
   - Treat underlying medical conditions
3. **Step Three**
   - Use pharmacologic strategies
4. **Step Four**
   - Use medication to moderate symptoms
Pharmacologic Interventions

Use Pharmacologic agents:
- For Psychotic behavior.
- For behavior that interferes with treatment.
- When other interventions fail.
- Including a low dose of haloperidol.
- Monitor patients closely.
- With caution, for a short time.

Manage Delirium: Environment

Promote sleep  Maintain comfort  Promote Rest  Reduce sensory loss

Manage Delirium: Nutrition

- Assail with meals.
- Find out food preferences.
- Provide favorites.
- Promote fluid balance.
- Monitor Electrolytes.
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Scenario: Identify Interventions

Situation: Postoperative patient.

Condition:
- Indwelling catheter and IV in place.
- Has hearing aids and glasses.
- Still does not understand that he has a catheter in place.
- Appears quiet but agitated and disoriented.
- No longer sees large items out the window.
- Delirium diagnosis.

Module Objectives

Now that you have completed this module, you should be able to:

1. Monitor older adults for the signs and symptoms of delirium.
2. Identify those at greater risk to develop delirium.
3. Provide interventions to prevent delirium for those at risk.
4. Accurately use delirium screening tools.
5. Use history, physical, and lab tests to identify and treat underlying conditions.
6. Provide a therapeutic environment and maximize supportive care.
9. Communicate with all members of the interdisciplinary team.
10. Involve the family in care planning, services after discharge, and education sessions.

Module Completion

Visit the NICHE Knowledge Center to receive your continuing education contact hours.

Upon successful completion of this interactive training, log in to the Knowledge Center and complete an online quiz and survey to calculate your continuing education contact hours. Upon completion, you will be directed to a training survey and download printouts of completion. Once the survey is complete, the training educator contact hours will appear on both your certificate of completion and training summary.

Before you begin the multiple-choice and essay questions that were provided during the training for use in completing the final Knowledge Check, these handouts are relevant in the Knowledge Check questions.
Appendix H

PCT Delirium Education Module
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Current Focus

- Delirium
- Dementia
- Depression

NicE

Objectives
Upon completion of this module, you will be able to:
- Describe the significance of delirium in older adults
- Identify care interventions to prevent and manage delirium

NicE

Questions About Delirium

- Risk of delirium increases with age, but it is not a normal age-related change
- 11%-42% of medically ill older adults
- 31% of older adults admitted to intensive care units and up to 62% of those on ventilators
- 5%-11% of hospital patients
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Questions About Delirium

<table>
<thead>
<tr>
<th>Who</th>
<th>What</th>
<th>Why Be Concerned</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Risk of delirium increases with age, but it is not a normal age-related change</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 1%–42% of medically ill older adults</td>
<td></td>
<td></td>
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<tr>
<td>• 31% of older adults admitted to intensive care units and up to 52% of those on ventilators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 12%–61% of hip fracture patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Common syndrome with rapid onset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Noticeable symptoms are:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Impaired attention</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Disorganized thinking</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Tends to change with a mixed course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Evident of underlying illness</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What Happens to Older Adults with Delirium?

• Increased adult care
• Increased post-op complications
• Longer hospital stays
• Functional decline
• Need more healthcare
• Long-term cognitive decline
• Nursing home placement
Who Gets Delirium?
Delirium is a common syndrome in older hospitalized adults and is a major cause of poor outcomes.

Delirium Subtypes

Hypoactive

Hyperactive

- Sicker on admission
- Have longer lengths of stay
- Are more likely to develop pressure ulcers as a result of immobility
- May be diagnosed as depression
- 25% of all delirium is hypoactive type

Signs and Symptoms:
- Sleepy, sluggish, uninterested, and withdrawn
- Slow speech or mumbling
- Laying in bed with increasing delirium
- Visual hallucinations (sensory perception not related to visible events)
**Delirium Subtypes**

<table>
<thead>
<tr>
<th>Hypoactive</th>
<th>Hyperactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital on admission</td>
<td></td>
</tr>
<tr>
<td>Have longer lengths of stay</td>
<td></td>
</tr>
<tr>
<td>Are more likely to develop pressure ulcers as a result of immobility</td>
<td></td>
</tr>
<tr>
<td>May be diagnosed as depression</td>
<td></td>
</tr>
<tr>
<td>25% or all delirium is hyperactive type</td>
<td></td>
</tr>
<tr>
<td>Clinical symptoms</td>
<td></td>
</tr>
<tr>
<td>Nervous, distraught, uninterested, and withdrawn</td>
<td></td>
</tr>
<tr>
<td>Disorient to speech or mumbling</td>
<td></td>
</tr>
<tr>
<td>Laying in bed with little interaction</td>
<td></td>
</tr>
<tr>
<td>Visual hallucinations (sensory perception not related to visual event)</td>
<td></td>
</tr>
</tbody>
</table>

- 22% of all delirium cases |
- Occurs away from the patient |
- High alert risk |
- Sleepy and symptomatic |
- Restless, irritable, combative, angry, uncooperative and easily distracted |
- Pass or loud speech |
- Wandering, climbing out of bed |
- Visual hallucinations

---

**Mixed Delirium**

Mixed delirium occurs when the patient is experiencing both hypoactive and hyperactive delirium. Daily care is challenging because the diagnosis is uncertain and changing.

---

**Implications of Delirium**

<table>
<thead>
<tr>
<th>Patient</th>
<th>Family</th>
<th>Staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barrier to communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased self-care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inability to eat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased blood tests, x-rays, etc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Increased medications</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MULTICOMPONENT NON-PHARMACOLOGICAL STRATEGY

Implications of Delirium

Patient
- Acute anxiety
- Barrier to communication
- Decreased self-care
- Time lost
- Increased blood tests, x-rays, etc.
- Increased medications

Family
- Barrier to communication
- Increased risk of conflict with staff
- Time lost
- Stressful

Staff

Risk Factors for Delirium

Internal risk factors:
- Dementia
- Advanced age
- Male gender

External risk factors:
- Cataract
- Immobilization (poor function or devices such as restraints or canes)
- Medications
- Alcohol or drug withdrawal
- Dehydration

- History of delirium
- History of stroke, TBI or head injuries
- Infections
- Acute illness
- Emotional stress
- Untreated pain
- Environmental overstimulation
- ICU
How Do You Recognize Delirium?

Early recognition is key to treating underlying causes and avoiding negative consequences.

- Know your older adult's history
- Be alert for risk factors
- Look, listen and ask

Knowledge Check

Select all that apply. Which of the following are risk factors for delirium?

A) Pt. with Dementia
B) Uncontrolled pain
C) Lack of sleep
D) Hearing or vision impairment

Prevention

What risk factors are present?
Can any be eliminated?
Are there changes in mental status?
Basic nursing interventions can be as effective as medical interventions.
Communication with the nurse is essential.
### NICHE Non-pharmacologic

<table>
<thead>
<tr>
<th>Prevention</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provide personal contact</td>
<td>• Reduce environment by reducing overstimulation, avoid loud clusters, and stabilizing morning and bedtime routines</td>
</tr>
<tr>
<td>• Improve sensory input through use of hearing aids, amplifiers, glasses, and adequate lighting</td>
<td>• Minimize isolation and maintain socialization of caregivers</td>
</tr>
<tr>
<td>• Promote family involvement</td>
<td>• Avoid use of physical restraints</td>
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### Knowledge Check

Select all that apply: Your role in preventing delirium includes which of the following:

A) Reassure and talk to the patient
B) Make the patient aware of what is happening
C) Keep their medication history
D) Recognize changes in behavior early and notify the nurse
<table>
<thead>
<tr>
<th>What to do for a Delirious Older Adult</th>
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<tr>
<td><strong>Promote Continence</strong></td>
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<tr>
<td>- Gather every 2 hours or more often</td>
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<tr>
<td>- Adjust for individual needs</td>
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<tr>
<td><strong>Encourage Adequate Rest</strong></td>
</tr>
<tr>
<td>- Provide daytime naps or rest periods</td>
</tr>
<tr>
<td>- Limit sleep interruptions</td>
</tr>
<tr>
<td>- Minimize nighttime interruptions</td>
</tr>
<tr>
<td><strong>Provide Nutrition and Hydration</strong></td>
</tr>
<tr>
<td>- Encourage at least 2.5 liters daily</td>
</tr>
<tr>
<td><strong>Improve Mobility</strong></td>
</tr>
<tr>
<td>- Maintain acceptable mobility level</td>
</tr>
<tr>
<td><strong>Minimize Sleeplessness or Impairment</strong></td>
</tr>
<tr>
<td>- Establish good communication</td>
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<table>
<thead>
<tr>
<th>What to do for a Delirious Older Adult</th>
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<td><strong>Promote Continence</strong></td>
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<tr>
<td>- Gather every 2 hours or more often</td>
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<td><strong>Provide Nutrition and Hydration</strong></td>
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<td>- Encourage at least 2.5 liters daily</td>
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<td><strong>Improve Mobility</strong></td>
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<td>- Maintain acceptable mobility level</td>
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<tr>
<td><strong>Minimize Sleeplessness or Impairment</strong></td>
</tr>
<tr>
<td>- Establish good communication</td>
</tr>
</tbody>
</table>

---
Remember:
- Working with an older adult who is confused takes time, so take your time.
- Don’t perform personal care without ensuring privacy.
- Create a daily schedule to give a sense of control and routine for older adults.

Knowledge Check
True or False: Basic nursing interventions can be as effective as medical interventions in preventing delirium.
A) True
B) False

Summary
Congratulations!
You should now be able to:
- Describe the significance of delirium in older adults
- Identify care interventions to prevent and manage delirium
Appendix I

Delirium IPOC

**Delirium IPOC:**

- Check daily CAM and notify MD if positive this part of the CAM process
- Ensure patient has in place:
  - Eyeglasses
  - Hearing aids
  - Dentures
- Orient frequently through the shift
- Provide cognitive stimulation
- Provide diversionary materials for patient such as busy apron, activity box, etc.
- Assess for pain a minimum of each shift
- Avoid all physically and chemically restrictive devices
- Provide family with informational material
- Encourage family to be at bedside as often as possible
- Ask family to complete the “About Me” poster
- Turn lights down and close curtains no later than 10 pm, avoid noise/TV after 10 pm
- Move to room with window as soon as possible and open window shades in morning
- Private room preferred
- Get patients OOB for all meals and PRN unless clinically contraindicated
Appendix J

RN Delirium Prevention Workflow Flyer

- Identify all patients assigned to you age 65 and older admitted to 6W
- Initiate Delirium IPOC in Cerner
- Select all activities
- Implement activities at least once per shift
- For some activities, implement throughout the shift such as frequent reorientation

Delirium IPOC:

- Check daily CAM and notify MD if positive this part of the CAM process
- Ensure patient has in place:
  - Eyeglasses
  - Hearing aids
  - Dentures
- Orient frequently through the shift
- Provide cognitive stimulation
- Provide diversionary materials for patient such as busy apron, activity box, etc.
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- Turn lights down and close curtains no later than 10 pm, avoid noise/TV after 10 pm
- Move to room with window as soon as possible and open window shades in morning
- Private room preferred
- Get patients OOB for all meals and PRN unless clinically contraindicated
Appendix K

PCT Delirium Prevention Workflow Flyer

**Admission**
- Identify all patients assigned to you age 65 and older admitted to 6W
- Consult with primary RN assigned to patients if okay to implement delirium prevention measures

**Initiation**
- Refer to delirium prevention strategy pocket card

**Implementation**
- Implement activities at least once per shift
- For some activities, implement throughout the shift such as frequent reorientation

**Delirium Prevention Strategy:**
- Ensure patient has in place:
  - Eyeglasses
  - Hearing aids
  - Dentures
- Orient frequently through the shift
- Provide cognitive stimulation
- Provide diversionary materials for patient such as busy apron, activity box, etc.
- Encourage family to be at bedside as often as possible
- Ask family to complete the “About Me” poster
- Turn lights down and close curtains no later than 10 pm, avoid noise/TV after 10 pm
- Open window shades in morning
- Get patients OOB for all meals and as needed unless clinically contraindicated as instructed by the RN
Appendix L

RN Pocket Card

Front:

Delirium Prevention - RN

- Identify all patients assigned to you age 65 and older admitted to 6W
- Initiate Delirium IPOC in Corner
  - Select all activities
  - Implement activities at least once per shift
  - For some activities, implement throughout the shift such as frequent reorientation

Back:

Delirium IPOC:
- Check daily CAM and notify MD if positive this part of the CAM process
- Ensure patient has in place: Eyeglasses, Hearing aids, Dentures
- Orient frequently through the shift
- Provide cognitive stimulation
- Provide diversionary materials for patient such as busy apron, activity box, etc.
- Assess for pain a minimum of each shift
- Avoid all physically and chemically restrictive devices
- Provide family with informational material
- Encourage family to be at bedside as often as possible
- Ask family to complete the “About Me” poster
- Turn lights down and close curtains no later than 10 pm, avoid noise/TV after 10 pm
- Move to room with window as soon as possible and open window shades in morning
- Private room preferred
- Get patients OOB for all meals and PRN unless clinically contraindicated
Appendix M

PCT Pocket Card

Front:

Delirium Prevention - PCT

- Identify all patients assigned to you age 65 and older admitted to 6W
- Consult with primary RN assigned to patients if okay to implement delirium prevention measures
- Refer to delirium prevention strategy pocket card
- Implement activities at least once per shift
- For some activities, implement throughout the shift such as frequent reorientation

Back:

Delirium Prevention Strategy:

- Ensure patient has in place: Eyeglasses, Hearing aids, Dentures
- Orient frequently through the shift
- Provide cognitive stimulation
- Provide diversionary materials for patient such as busy apron, activity box, etc.
- Encourage family to be at bedside as often as possible
- Ask family to complete the “About Me” poster
- Turn lights down and close curtains no later than 10 pm, avoid noise/TV after 10 pm
- Open window shades in morning
- Get patients OOB for all meals and as needed unless clinically contraindicated as instructed by the RN
## Appendix N

### Project Timeline

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<td>Meet and discuss project with DNP team</td>
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<td>02/15/2020</td>
<td>Meet with key stakeholders to discuss project overview</td>
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<td>Obtain site letter of cooperation</td>
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<td>Submit IRB application</td>
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<td>Perform retrospective chart review pre-intervention delirium incidence</td>
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<td>Distribute flyers and electronic mail to nursing staff at orthopedic unit</td>
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<td>09/14/2020</td>
<td>Repeat flyer and electronic mail distribution to nursing staff at orthopedic unit</td>
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<td>09/21/2020</td>
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<td>Workflow process sheet distributed to participants</td>
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<td>Perform Prospective chart review post intervention from patients admitted to orthopedic unit from 10/19/2020 to 10/23/2020</td>
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</table>
Appendix O

Participant Surveys E-mail Instruction

To: all study participants
Cc:
From: Janie Viuya, BSN, RN, RN-BC, GRN
Subject: Post-study Survey Instructions

Hello 6W Study Participants,

Thank you for your participation in this study! Here is a link to a Survey to give your feedback about your experience. The survey is available on Survey Monkey. Please only take the survey one time. Please complete the survey no later than November 15, 2020. For any questions regarding the survey and these instructions please don’t hesitate to contact me.

Survey link: ______________________

Best regards,

Janielle Viuya, BSN, RN, RN-BC, GRN
Geriatric Nurse Coordinator
Appendix P

Survey for Participants

A Multicomponent Non-Pharmacological Strategy Quality Improvement Project for Delirium Prevention in Hospitalized Older Adults

Multicomponent Non-Pharmacological Strategy for Delirium Prevention in Older Adults

Thank you for your participation in this study. This survey will be used to improve future studies and identify areas that worked well and areas that require improvement.

1. What is your role? 
   
   - [ ] Registered Nurse
   - [ ] Patient Care Technician

2. How long have you been employed in?

   - [ ] 6 months - 1 year
   - [ ] 1 year - 2 years
   - [ ] 2 years to 5 years
   - [ ] Greater than 5 years
3. Do you have any previous experience with Delirium or any previous modules completed through the NICHE program?

☐ Yes
☐ No

If yes, please specify what and when

4. What age range are you in?

☐ 18-24
☐ 25-34
☐ 45-54
☐ 55-64
☐ 65+
5. Overall, how satisfied were you with the project activities?

- Very satisfied
- Satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Dissatisfied
- Very dissatisfied

6. How satisfied were you with the educational module?

- Very satisfied
- Satisfied
- Somewhat satisfied
- Neither satisfied nor dissatisfied
- Somewhat dissatisfied
- Dissatisfied
- Very dissatisfied
7. How likely are you to use the delirium prevention strategies in practice?

- Very likely
- Likely
- Somewhat likely
- Neither likely nor unlikely
- Somewhat unlikely
- Unlikely
- Very unlikely

8. Overall, what could have been done differently to improve the study?


9. What did you like best about the study?


10. What did you like least?


Appendix Q

RN Delirium Post-test

1. Case Scenario:

82 y/o male pre-operative patient. He is alert, oriented, and understands surgery.
He drives and plays golf. He has a PMH of type 2 DM, HTN.
He has had surgery before.
He needs hearing aids and glasses.
He is drinking less fluids at home.
His labs show elevated Hct, BUN, and Cr.
Home medications include oral hypoglycemic agents and CCBs.

Which of the factors presented on admission to the hospital place the patient at risk for developing delirium?

- [ ] Multiple medications
- [ ] Dehydration
- [ ] Previous surgery
- [ ] Age over 70
- [ ] Active lifestyle

2. Which of the following are clinical features of delirium? Select all that apply and press submit.

- [ ] Develops rapidly and fluctuates
- [ ] Inattention and disorganized thinking
- [ ] Nausea
- [ ] Altered level of consciousness
3. Case Scenario:

82 y/o male pre-operative patient. He is alert, oriented, and understands surgery.

He drives and plays golf. He has a PMH of type 2 DM, HTN.

He needs hearing aids and glasses.

He is drinking less fluids at home.

His labs show elevated Hct, BUN, and Cr.

Home medications include oral hypoglycemic agents and CCBs.

You are caring for this patient on POD#0. He has an indwelling catheter and IV. He is missing his hearing aids and glasses. He does not understand that he has a catheter in place. He appears quiet but agitated and disoriented. He states he is seeing snakes on the wall.

**What can you do to help prevent and manage delirium?**

- [ ] Have his wife return with his glasses and hearing aids
- [ ] Continue to explain the function of the catheter
- [ ] Move him to a room without a window, far away from the nurses’ station
- [ ] Administer Haldol
4. Case Scenario:

82 y/o male pre-operative patient. He is alert, oriented, and understands surgery. He drives and plays golf. He has a PMH of type 2 DM, HTN.

He needs hearing aids and glasses.

He is drinking less fluids at home.

His labs show elevated Hct, BUN, and Cr.

Home medications include oral hypoglycemic agents and CCBs.

You are caring for this patient on POD#0. He has an indwelling catheter and IV. He is missing his hearing aids and glasses. He does not understand that he has a catheter in place. He appears quiet but agitated and disoriented. He states he is seeing snakes on the wall.

Using the CAM tool, indicate which of the following signs of delirium this patient is experiencing:

Feature 1: Acute onset or fluctuating course

Feature 2: Inattention

Feature 3: Disorganized thinking

Feature 4: Altered level of consciousness

☐ Acute change in mental status

☐ Lethargic - easily awoken

☐ Rambling incoherent conversation

☐ Visual disturbances

☐ Difficulty focusing attention
5. Case Scenario:

82 y/o male pre-operative patient. He is alert, oriented, and understands surgery.

He drives and plays golf. He has a PMH of type 2 DM, HTN.

He needs hearing aids and glasses.

He is drinking less fluids at home.

His labs show elevated Hct, BUN, and Cr.

Home medications include oral hypoglycemic agents and CCBs.

You are caring for this patient on POD#1. He has an indwelling catheter and IV. He has hearing aids and glasses. Appears quiet but agitated and disoriented. He has been diagnosed with post-operative delirium.

Which of the following interventions should be considered to reduce the patient's symptoms associated with delirium?

- [ ] Frequently reorient the patient while avoiding arguing
- [ ] Get an order to remove the indwelling catheter with trial of voiding
- [ ] Assign different nurses and PCTs each day for this patient
- [ ] Encourage use of glasses and hearing aids
6. Case Scenario:

82 y/o male pre-operative patient. He is alert, oriented, and understands surgery.
He drives and plays golf. He has a PMH of type 2 DM, HTN.
He needs hearing aids and glasses.
He is drinking less fluids at home.
His labs show elevated Hct, BUN, and Cr.
Home medications include oral hypoglycemic agents and CCBs.
You are caring for this patient on POD#2. The indwelling catheter and IV are now discontinued.

**What interventions will help reduce delirium symptoms?**

- Get him out of bed to chair for his meals
- Help facilitate visitations with his wife
- Provide his favorite beverage
- all of the above

7. What interventions are appropriate to improve sleep? Select all that apply

- □ Closing the blinds
- □ Leaving the TV on very loud
- □ Encourage the staff to adhere to quiet time
- □ Assisting the patient in a comfortable position
- □ Wake the patient every 4 hours to ask about pain medication

8. Which medication is known to precipitate delirium?

- □ Antibiotics
- □ Anticholinergics
- □ Oral hypoglycemic agents
- □ Antipyretics
9. Select **predisposing** factors for delirium

- Increased age
- Cognitive impairment
- Sensory impairment
- Hospital acquired infection

10. Which of the following is a barrier to early diagnosis and treatment of delirium?

- Distinguishing delirium from dementia
- Failure to get an adequate history before admission
- Recognition of non-agitated behaviors associated with delirium
- Support from the organization to screen for delirium
## Appendix R

### RN Preliminary Results Table

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## Appendix S

### Pre-Intervention Data

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<th>Census</th>
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*Minus exclusion criteria (Delirium present on admission): 123*

**Delirium Incidence Rate:** 14.63%

### Chart Review Age Ranges

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**Total:** 60, 30, 33
Appendix S

Post-Intervention Data

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Minus exclusion criteria (Delirium present on admission): 168
Delirium Incidence Rate: 5.95%

Chart Review Age Ranges

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### Appendix T

#### Delirium Incidence Rates

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