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Mitigating Delirium for the Elderly Post-Operatively Without Medication

Ann Lo Basso

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DOCTOR OF NURSING PRACTICE (DNP) PROGRAM

A DNP PROJECT

Mitigating Delirium for the Elderly Post-Operatively Without Medication

Ann Lo Basso

**DNP PROGRAM PRIMARY ADVISOR
& DNP TEAM MEMBER (S):**

Dr. Beverly Lunsford, PhD, RN, FAAN

Dr. Karen Whitt, PhD, RN, FNP-C, AGN-BC, FAANP

Dr. Patricia Quinlan, PhD, RN

Dr. Kathleen B. Duncan, EdD

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The George Washington University

Mitigating Delirium for the Elderly Post-Operatively Without Medication

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In partial fulfillment of the requirements

For the Degree of Doctor of Nursing Practice

By

Name of DNP Student:

Ann Lo Basso

Approved: Beverly K. Lunsford, PhD, RN, FAAN
DNP Primary Advisor

Approved: Karen Whitt, PhD, RN, FNP-C, AGN-BC, FAANP
DNP Second Advisor(s)

Approved: Kathleen B. Duncan, EdD, RN
DNP Team Member(s)

Approved: Patricia Quinlan, PhD, MPA, RN, CPHQ

Approval Acknowledged: [Click or tap here to enter text.](#)
Director DNP Scholarly Projects

Approval Acknowledged: [Click or tap here to enter text.](#)
Assistant Dean for DNP Program

Date: May 14, 2020

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Abstract

Background: Often occurring after surgery, or hospitalization, the development of delirium in older adults, initiates a cascade of events culminating in loss of independence, increased morbidity and mortality, and high health care costs (Oh, et al., 2017).

Objective: The purpose of this quality improvement (QI) project was to adapt and implement best practices using HELP for managing older patients with postoperative delirium through the existing 1:1 observation structure and implementing cognitive care strategies. The 1:1 sitter roles and responsibilities were redesigned to include non-pharmacological, multicomponent interventions.

Methods: The QI project used a pre-test post-test intervention design comparing groups before and after the intervention measuring: 1) hours of 1:1 care; 2) number of interventions used; 3) patient length of stay; and 4) use of psychotropic drugs. Data was collected using a standard patient checklist and customized reports.

Results: There was a statistically significant difference in the number of observation hours between the pre-(n=32) and post-intervention (n=33) groups ($p < .05$), with a mean score of 124.1 versus 62.3 hours respectively; a significant difference in length of stay ($p < 0.05$) with a mean score of 142.6 versus 218.9 hours respectively; a significant difference in the number of medications given ($p < .001$) with a mean score of 0.9 versus 0 respectively; and a significant difference in the number of interventions utilized ($p < .001$) with a mean score of 4.7 versus 8 respectively.

Conclusions: This project indicated that the adapted non-pharmacologic HELP model interventions resulted in decreased 1:1 sitter hours, overall length of stay and medication use in postoperative delirious patients.

Background of the Problem

Postoperative delirium is a quintessential geriatric complication (Inouye, 2006). The American Psychiatric Association (2013) defines delirium as a disturbance in attention and awareness that develops over a short period of time, hours to days, and fluctuates over time. Delirium is a common complication in elderly hospitalized patients (Folstein, Bassett, Romanoski, & Nestadt, 1991), occurring in 14% to 56% of elderly hospital inpatients, 10% to 60% of postoperative patients (Inouye, 2006), and up to 80% of critically ill patients (Vaurio, Sands, Wang, Mullen, & Leung, 2008).

“Often occurring after acute illness, surgery, or hospitalization, the development of delirium initiates a cascade of events culminating in loss of independence, increased morbidity and mortality, institutionalization, and high health care costs” (Oh, Fong, Hshieh, Inouye, 2017). Post-operative delirium can lead to long-term cognitive issues increasing the care burden for the family (Oh & Park, 2019). Until recent decades, hospital-acquired delirium, which typically lasts anywhere from a couple of days to several weeks but can even last months, was attributed to old age and not considered a condition to be prevented or treated (Collier, 2012). In the last decade, costs of United States healthcare expenditures have been soaring, with billions of dollars spent on hospital readmissions (Hospital Elder Life Program, n.d.). Despite efforts to characterize the epidemiology and risk factors, development of easily administered diagnostic tools, and dissemination of prevention and treatment protocols, delirium remains under-diagnosed and undertreated (Inouye, 2006).

Examining delirium provides an opportunity to improve the quality of hospital care while improving patient outcomes, decreasing length of stay, and improving hospital revenues (Zaubler et al., 2013). 1:1 sitters are assigned to care for patients who become confused to assure they are

not injured during their stay. Not only does this take a caregiver away from their assignment, leaving the unit short one person or more, but also this individual simply sits at the bedside not engaging in any activity with the patient. As the acuity of older patients continues to increase, as do healthcare costs, the patient and the institution benefit from initiatives that will reorient the patient more quickly, thus decreasing the length of time the patient is in this state.

This project addressed several key needs of healthcare organizations. These included utilizing non-pharmacological approaches, when possible, and maintaining competent staff. With the national opioid epidemic, this quality improvement project provided an excellent opportunity to focus on improving cognitive stimulation in older patients to have better cognitive outcomes utilizing non-pharmacological interventions. Healthcare clinicians need to focus on interventions other than medications that will facilitate a patient recovering more quickly. The pharmacologic medications can elongate the patient's length of stay and increase the patient's risk factors such as patient falls (Lamis, Kramer, Hale, Zackula, & Berg, 2012). With the fear of addiction and the fear of complications from analgesic medications, the healthcare team is ever more sensitive to alternatives to treat pain. Pain intensity, pain distress and sleep disturbance from pain decrease the older adult's ability to return to preoperative functional status (Duggleby et al., 2004). Through the adapted Hospital Elder Life Program (HELP) model, the 1:1 sitter, in partnership with an RN, will utilize non-pharmacologic interventions around the clock to reorient the patient, helping the patient be able to get back to their normal activities of daily living.

Another opportunity is the human resource concern with patient care assistants (PCAs) who provide the 1:1 sitter service. They may be terminated because they fall asleep when assigned to observe these types of patients as a 1:1 sitter. Currently, their responsibility is basically to sit and ensure that the patients remain safe. If the patient is sleeping, the role can

become quite stagnant especially on the night shift causing some 1:1 sitters to fall asleep, which may cost them their employment (see Appendix A). This adapted HELP model allowed the PCA to increase their 1:1 interaction with the patient while providing care around the clock. This interaction allowed the 1:1 sitter to remain engaged, as well as the patient, a positive experience for both.

Problem Statement

Delirium can complicate the perioperative period for older adults. Pharmacologic methods have not been found to be effective in treating post-operative delirium, as approximately 40% of cases of delirium are related to medication use (Demeure, et al., 2006). Multicomponent, non-pharmacological intervention is needed to decrease incidence and duration of confusion/delirium in postoperative older patients decreasing the patient's time requirement with a one-to-one sitter.

The healthcare organization where this project was conducted serves a large number of older postoperative patients at risk for delirium, yet the impact of multicomponent, non-pharmacological interventions had not been formally evaluated. For example, in 2018, there were 4,601 elderly patients over the age of 70 admitted to this hospital and 138 of these patients required 1:1 monitoring.

Purpose

The purpose of this QI project was to implement best practices utilizing an adapted HELP model for managing older patients with postoperative delirium through the existing 1:1 observation structure and implementing cognitive care strategies. The 1:1 sitter roles and responsibilities were redesigned to include non-pharmacological, multicomponent interventions.

Aims

The aims of this QI project were as follows:

1. Implement best practices utilizing an adapted HELP model to manage the care of older patients with postoperative delirium/ confusion through utilizing the existing 1:1 observation structure, in partnership with an RN and implementing cognitive care strategies. These included: (a) cognitive stimulating activities, such as reading current events to patients and word games to help with time reorientation; (b) sleep protocols such as warm milk or relaxation music and rescheduling of medications; (c) early mobilization protocols; and (d) orientation protocols such as wall clocks, (e) vision and hearing protocols assuring eyeglasses and hearing aids are in use as needed at all times and (f) oral volume repletion to assure patient does not become dehydrated. These cognitive care strategies were adapted from the Hospital Elder Life Program, a carefully designed and tested program that had been demonstrated to decrease cognitive and functional decline in hospitalized older patients (HELP, n.d.).
2. Evaluate the effectiveness of the adapted HELP intervention by comparing pre and post-intervention hours of 1:1 care, hours classified as confused, number of care strategies utilized, length of stay, and psychotropic drug use among post-op patients with delirium.

Significance

Delirium, an acute decline in cognitive functioning, is a common, serious, and often-fatal disorder that affects as much as 50% of elderly people in the hospital (Inouye, Westendorp & Saczynski, 2014). Delirium is a serious complication for older adults because an episode of delirium can initiate a cascade of deleterious clinical events, including other major postoperative complications, prolonged hospitalization, loss of functional independence, reduced cognitive function, and death (American Geriatrics Society Expert Panel, 2014). Recent transformations in

hospital care have resulted in an increasingly rapid pace and technological focus; shorter lengths of stay, reductions in skilled nursing staff, and the use of unlicensed patient care personnel (Inouye, Schlesinger, Lydon, 1999).

The need for protocols to improve the care and outcomes of our elderly population is of utmost importance and nurses have the ability to help develop these protocols through evidence-based practice. Older postoperative patient's delirium is usually attributed to several factors, such as co-morbidities and/or hospital-related concerns, including medications, lack of mobility, setting, and dehydration. The Hospital Elder Life Program (HELP), which was developed in 1993, is a cost-effective, evidence-based program that helps hospitalized patients with delirium by coordinating their care utilizing a multidisciplinary team (Inouye et al., 1999). This team which consists of an elder life nurse specialist, a geriatrician, and trained volunteers uses six non-pharmacologic strategies which may decrease delirium: a) mobilization; b) orientation, c) sensory adaptation, d) social interaction, e) non-pharmacological approaches to sleep and anxiety and f) assistance with meals and hydration (Inouye et al., 1999).

The HELP, developed in 1993, is a multicomponent intervention shown to be effective for targeting risk factors for delirium in the hospital in older adults to preserve their physical and cognitive functioning (Chen, et al., 2015). The goals are achieved with coordination of care between the primary healthcare team and the HELP staff members which include an Elder Life Specialist, Elder Life Nurse Specialist, geriatrician, and trained volunteers who conduct patient-centered interventions focused on reversing sleep deprivation, immobility, visual and hearing impairment and reversible cognitive impairment (Chen, et al, 2015). This QI project utilized an adapted HELP model to improve the outcome of the postoperative confused patient by decreasing incidence and duration of confusion experienced by the older adult. The adapted

model did not utilize the HELP staff members such as the Elder Life Specialists however it utilized the patient-centered interventions to help reorient the patient. The RNs and the 1:1 sitters were trained to these interventions and how they could improve patient outcomes (see Appendix B).

Literature Review

Search Strategy

To realize best practices in improving the care of elderly post-operative patients with dementia, it was essential to understand the evidence supporting the best practice. Therefore, a scholarly literature search was conducted using ProQuest, EBSCOhost, and PubMed. The time period included the last ten years, 2008 to 2018. The search included search term combinations, which include: (“delirium”[MeSH Terms] OR ”delirium”[All Fields]) AND (“hospitals”[MeSH Terms] OR “hospitals” [ALL Fields] OR “hospital”[All Fields]) AND (“postoperative period”[Mesh Terms] OR (“postoperative”[All Fields] AND “period”[All Fields]) OR “postoperative period” [All Fields] OR (“post”[All Fields] AND “operative”[All Fields]) OR “post-operative”[All Fields]).

Inclusion and Exclusion Criteria

The inclusion criteria for the literature review were: 1) post-operative hospitalized patients hospitalized who experienced delirium; 2) patients over the age of 70 years of age; 3) non-pharmacologic interventions; 4) research within ten years (2008-2018); 5) studies that used quasi-experimental design, experimental design and pre-post design.

The exclusion criteria included 1) patients that were admitted with cognitive dysfunction upon admission to the hospital, 2) observational studies, 3) patients admitted with hepatic and renal insufficiency, 4) patients admitted with communication and listening impairment, 5)

ambulatory or outpatient studies, 6) pediatric patients or patients younger than 70 years of age and, 7) pharmacologic interventions.

Synthesis of the Literature

Described as an independent marker of functional decline, delirium is a critical clinical issue for older patients and not well understood (Carr, 2013). The literature shows that management of delirium is multifactorial (Inouye, et al., 1999) and should address specific patient and care factors contributing to the delirium (Inouye, et al., 1999). Evidenced were different practices in addressing delirium in postoperative elderly patients. The two main models include the geriatric consultation services and specialized geriatric units such as the acute care for the elderly units. The inpatient geriatrics consult team offers consultative services on issues including polypharmacy, gait impairment and falls, cognitive impairment and delirium, elder abuse and neglect, goals of care in patients with multiple comorbidities, and other geriatric syndromes (Syed, 2012).

The geriatric consultation services model was not successful due to lack of trained staff with the appropriate geriatric expertise (Tzeng, 2007; Bailey, 2009). The geriatric units are based on a discrete ward or geographically designated beds. Ward-based services often involve direct care by the geriatric medicine team of the older patient, and some are shared care between admitting physician, or surgeon, and the geriatric medicine team (Cameron & Kurrie, 2013). The studies showed that geriatric units are costly to run because their focus is so limited in an institution (Gray, 2007; Hogan, 1990; Fretwell, 1990). Therefore, the outcomes for each of these models have been inconsistent. In addition, many studies have addressed the role of the 1:1 sitter in delirium and evidence supports a role for the sitter as part of the management of this patient (Inouye et al., 1999; Inouye et al., 2000; Caplan & Harper, 2007; Sendelbach & Guthrie, 2009).

Hospital 1:1 sitters are usually PCAs employed by the hospital or brought in from the outside by an agency. 1:1 sitters provide a compassionate substitute for restraints, seclusion rooms and other measures to deal with delirious and/ or challenging patients.

Multicomponent approaches appear to be the most effective for managing elderly patients with post-operative delirium and are targeted toward six risk factors: (a) orientation (b) early mobilization to avert immobilization; (c) interventions to prevent sleep deprivation; (d) communication methods and adaptive equipment (especially eyeglasses and hearing aids) for vision and hearing impairment and early intervention for volume depletion, (e) therapeutic activities and (f) oral volume repletion (Inouye, 2006).

The work of Sharon Inouye (1999) was among the best evidence demonstrating specific non-pharmacological interventions to prevent delirium in elderly patients. She and her colleagues described non-clinical volunteers, working under the direction of a dedicated RN that successfully prevented mental decline using simple techniques to engage the mental attention of elderly patients. Based on these findings Inouye founded the Hospital Elder Life Program (HELP).

The HELP differs from geriatric wards or geriatric consultative services by providing skilled staff to carry out evidence-based, core interventions designed to be applied throughout the hospital (Reuben, Inouye, Bogardus, Baker, Leo-Summers, Cooney, 2000). All three types of programs, inclusive of the HELP initiative, geriatric wards and geriatric consultative services have proven to be most effective in reducing the incidence of delirium when implemented before and then continued after surgery (Inouye, et al., 2006; Marcantonio, et al., 2001; Friedman, et al., 2009).

The aging brain is more susceptible to developing delirium when exposed to anesthetic agents (Young & Inouye, 2007). The most common three medications, which result in delirium in the elderly, are benzodiazepines, morphine and anticholinergics (Young & Inouye, 2007). Only when other measures are unsuccessful, pharmacologic control may be necessary but this should be considered as the last option.

Published research and clinical practice guidelines noted that implementation of a multimodal intervention reduces the duration of delirium and length of hospital stay (Lundstrom et al., 2007; Chen et al., 2011; Lundstrom et al., 2005; Zaubler et al., 2013; Rubin et al., 2006; and Inouye et al., 2003). These multimodal interventions include prevention and treatment of complications such as urinary tract infections by removing foley within the first twenty-four hours post-operatively, staff education in caring, rehabilitation and teamwork, blood pressure monitoring discontinued after forty-eight hours unless medically necessary and mobilizing patients within the first twenty-four hours post-operatively (Lundstrom et al, 2007). Thus, articles in this literature review supported multimodal non-pharmacological interventions to reduce delirium delivered by the 1:1 sitter in partnership with an RN as a new protocol. Therefore, an adapted version of the HELP intervention was proposed to address the needs of older postoperative patients in this quality improvement (QI) project (see Appendix C).

Evidence-Based Practice Translation Model

Nurses understand that evidence-based practice (EBP) improves the quality of patient outcomes while controlling the cost of healthcare (Melnyk, Fineout-Overholt, Gallagher-Ford, & Kaplan, 2012). In their study of 1,054 RNs Melnyk et al. (2012) discovered that although nurses' value EBP, they required education, access to information, and time to implement EBP into daily practice. Nurses and other healthcare providers want their practice based in evidence,

but they also acknowledge the barriers of lack of education and time to implement and use EBP (Brown, 2014). EBP is a problem-solving approach to clinical decision-making that integrates the best evidence from well-designed studies with a clinician's expertise along with patients' preferences and values (Melnyk, et al, 2012).

The Iowa Model of Evidence-Based Practice provides a step-by-step guide on how to take a clinical problem and match it with an intervention based on research to make an organizational or departmental change to practice (see Appendix D). Experiences with research have led to the belief that several factors, called triggers which are knowledge or problem focused, encourage nurses to think about their practice and to question the rationale for their actions (Titler et al., 1994). For this QI project, the problem-focused trigger is the identification of a clinical problem, i.e. dealing with postoperative dementia in elderly patients.

Dementia in postoperative elderly patients is a difficult situation for two reasons. It is a frightening state for patients and their family members and it prolongs a patient's length of stay, which may affect hospital finances. EBP is a pathway to excellence and has now become an expectation of health care professionals. Within the practice setting, there is an increasing challenge to provide clearly measurable care of the highest quality, which is evidence-based (Doody & Doody, 2011, p 661). The Iowa Model is a pragmatic way of evaluating evidence and implementing EBP changes (Steelman, 2015).

Methodology

Practice Question

Do non-pharmacologic interventions, using an adapted HELP model compared to routine surveillance result in decreased hours of one to one care, length of stay, and psychotropic drug use in elderly post-op patients at risk for delirium during their acute-stay hospitalization?"

Design

The practice question was evaluated using QI methodology, specifically a pre-and post-test intervention design. A pretest measure of the outcome of interest is measured, then a treatment administered, with a posttest of the same outcome is measured (Salkind, 2010). This method compared: 1) hours that patients were considered delirious, 2) hours of one to one personal care assistant (PCA) per patient, 3) the types of interventions (and frequency) used by the PCA per patient, 4) patient length of stay, 5) use of psychotropic drugs or pain medications, and 6) number of adverse patient events. Through the nursing education department, the RNs received training on the process and documentation and the 1:1 sitters received training on how to utilize the interventions. Nursing leadership rounded on the 1:1 sitters during their shift to monitor compliance.

Setting

This quality improvement initiative was conducted at a large academic medical center in the Northeast United States. The medical center provides inpatient and ambulatory care for pediatric and adult medicine. The medical center has greater than 35,000 surgeries annually. The medical center is a National Orthopedic Institute-designated orthopedic center and is internationally renowned. Since older patients can be assigned to any of the five post-operative units, the entire hospital participated in the intervention.

Sample

The study population included all patients 70 years or older admitted for surgery that experienced acute confusion post-operatively. Some of the primary types of orthopedic surgeries include complex spine, knee replacements and hip replacements.

Recruitment

There was not a need to recruit, as all patients 70 years and older who are postoperative were included. This was a QI initiative and data were collected through utilization of a standard patient checklist and customized reports providing secondary data (see Appendix E).

Consent Procedure

Consent was not required as the hospital under study deemed this project as secondary research (see Appendix F).

Risks/ Harms

No risks/ harms were identified. These patients required a 1:1 sitter due to post-operative confusion. They would have been assigned a sitter normally. The difference with this quality improvement project is that now the sitter interacted utilizing an adapted HELP model of care with the patient to help reorient them.

Project Procedure

Previously, when a patient was experiencing an episode of acute confusion, the provider placed an order in the electronic medical record for a 1:1 sitter to observe the patient. The 1:1 sitter was to maintain the patient's safety without any specific assigned interventions.

The new project intervention included the following steps.

1. The RN assessed all post-operative patients 70 years of age or older for any change in altered mental status requiring 1:1 observation.
2. If the patient was experiencing abnormal mental status, the patient's RN escalated the assessment to their Nurse Leader or patient's physician to evaluate for the need of a patient sitter.

3. If the patient met the criteria, a physician order was generated and the patient was assigned for a 1:1 sitter.

The RN and 1:1 sitter reviewed and discussed which would be the best and appropriate adapted HELP program activities for the patient, and then the 1:1 sitter was responsible to carry out as many of them out as possible around the clock. The PCA obtained the activity kit (see Appendix G) and interacted with the post-operative older patient experiencing delirium by utilizing the following interventions from the adapted HELP model. The 1:1 sitter (a) utilized the patient orientation board (white board) to reorient a confused patient in order to update specific information such as reviewing the patient's schedule for daily care; (b) demonstrated the ability to assist with routine care and activities of daily living when caring for the confused patient;(c) provided orientation information to patients; (d) used calendars to reorient patients to the day, month and year when providing care; and (e) used clocks to reorient patients to time of day . To develop communication skills, the 1:1 sitter (a) introduced self by name each encounter; (b) used verbal communication and non-verbal communication skills to provide comfort; (c) recognized patients' cultural differences when communicating with them about their needs; and (d) repeated questions as needed to give patients time to process information. The 1:1 sitter assisted patients in adequate food and fluid intake to maintain good nutrition and promote the healing process by: (a) measuring patient's height and weight daily; (b) discussing the meal menu of the day with patients to offer choices; (c) encouraging fluid intake; and (d) applying dentures, hearing aids, and glasses as often as necessary, if appropriate.

To promote mobility, the 1:1 sitter (a) performed range of motion as appropriate; and (b) assisted patients with proper ambulation to promote safety. The therapeutic activity program maintains the patient is mentally stimulated by providing pleasurable activities, boosting

confidence and inspiring socialization (HELP Volunteer Manual, 1999). The goal was to help relieve anxiety, pain and promote sleep through: (a) providing warm milk or chamomile tea; (b) keeping the room bright during the day and dark during the night shift; (c) having family visit as much as possible or mentioning family member names as frequently as possible; (d) reading current events such as the newspaper and (e) playing trivia games and memory games as often as possible.

The RN documented the activities provided by the 1:1 sitter in the electronic medical record. At the end of the shift the RN and 1:1 sitter discussed the patient's response to the activities and made a decision as to whether a 1:1 sitter should continue during the next shift.

Subject Costs and Compensation

This quality improvement project provided targeted interventions, selected by the RN in discussion with the sitter, including stimulation activities, therapeutic activities and sleep enhancement strategies provided by a 1:1 sitter who had been properly trained. This required the purchasing of board games, conversation cards, tea, daily newspapers, fidget spinners, cubes, chamomile tea bags and lavender scented lotions and individualized activity kits were made for patients containing all these tools (see Appendix G). Since this initiative may have a positive impact on length of stay and may decrease the length the patient is confused, the hospital was willing to provide the cost of these products.

Project Timeline

Pre-intervention data, i.e. simply one to one patient sitting, was collected from May 2019 through the 2nd week of August 2019 and included 32 patients. During the last two weeks of August and first two weeks of September, the 1:1 sitters and RNs received education. The post-

intervention data was collected from the 3rd week in September 2019 through December 2019 with 33 patients.

Evaluation

An Epic report was created to collect the necessary data from the patient charts for the QI project. It had a time stamp of the start of the order and a time stamp of the time the order was discontinued. This data was collated pre-intervention and compared to post-intervention. The data collected was a group activity since it depended on the managers identifying the patients and the 1:1 sitters carrying out the initiatives (see Appendix H). The report created in Epic displayed the outcome measures inclusive of, 1) total hours that patients were considered confused 2) total hours 1:1 sitter assigned to patient, 3) the types of interventions (and frequency) used by the PCA per patient, 4) patient overall length of stay in hours, and the 5) use of psychotropic drugs or pain medications (see Appendix I). Please note that although there was no formal 1:1 sitter plan pre-intervention, the 1:1 sitters oriented patients to their name and place, applied dentures, glasses and hearing aids as needed. The hospital was unable to provide resources to monitor patient adverse event data therefore this data was unable to be collected and analyzed in this PI project.

Results

Descriptive frequencies were used to evaluate the impact of age, gender, interventions, medications, and length of stay on the mean scores of both the pre- and post-intervention groups. A t-Test utilizing a two-sample, assuming unequal variables was used to analyze differences between pre and post intervention outcomes since the post-intervention group had one additional patient than the pre-intervention group.

There was a statistically significant difference in observation (1:1) hours post intervention with a mean score of 124.1 hours for the pre-intervention group compared to a mean score of 62.3 hours in the post intervention group ($p < .05$). In addition, there was a statistically significant difference in the number of interventions utilized in the post group as compared to the pre-intervention groups with 156 interventions utilized in the pre-group compared to 283 in the post- group ($p < .001$). This included cognitive stimulating activities and vision, dentures, and hearing protocols, which have been shown to prevent delirium (Inouye, 1999)

There was a statistically significant difference in length of stay in the pre ($M=218.9$ hours) versus the post intervention ($M= 142.6$ hours) group ($p < .05$). Finally, there was a statistically significant difference between the number of medications given pre and post intervention, as 30 psychotropic medications were given to the pre-intervention group and no psychotropic medications were given to the post-intervention patients ($p < .001$).

Conclusion

The interdisciplinary approach with the RN assessment and activation of intentional interactions by the patient sitter showed a decrease in psychotropic medication use, a decrease in overall length of stay hours post intervention, as well as a decrease in patient sitter hours. Utilizing an adapted HELP model, this QI project helped to improve the outcome of postoperative delirious elderly patients by decreasing incidence and duration of delirium experienced by the older adult.

Limitations included small sample size; not being able to gather information on the specific interventions used which could have shown if some interventions had a more significant effect than others. In addition, using secondary data in different time frames gave a comparison between the two groups. A future study could include a control group in the same period.

Based on these findings, it is recommended that nursing protocols be modified to include the use of the HELP model with older postoperative patients. Early introduction of these interventions may even help to prevent post-operative dementia (HELP, n.d.), but certainly could be implemented if a patient develops delirium. Additional research is recommended prior to PCAs receiving further training in the implementation of HELP interventions. Cognitive stimulating activities have been shown to decrease cognitive decline in older hospitalized patients (Cheng, Chiu, Wang, Liu, & Shyu, 2007). These findings also contribute to the literature of best practices to improve the care of the elderly population through the use of evidence-based practice.

Summary

Delirium and functional decline are common and potentially preventable complications of hospitalization for elderly patients (Hospital Elder Life Program, n.d.). While delirium is rarely caused by a single factor, several factors such as immobilization, adverse effects of medications, restraints, and sleep deprivation have been associated with their decline (Inouye, 2006). This initiative is a model of care, designed to prevent delirium and functional decline in postoperative elderly patients. The program involves collaboration among interdisciplinary staff to carry out assessment and intervention protocols: (a) orientation; (b) therapeutic activities; (c) early mobilization; (d) vision and hearing protocols; and (e) sleep enhancement. Savings accrue primarily through cost avoidance or the reduction in expenditures that would have occurred if the program were not in place (HELP, n.d.).

Additionally, the reduction of post-operative delirium ensures better patient outcomes, fewer complications, and a decreased likelihood of continuing cognitive effects. This benefits both the patient and their families (Oh & Park, 2019).

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APPENDIX A

SWOT Analysis

	<p align="center">Helpful To achieving the objective</p>	<p align="center">Harmful To achieving the objective</p>
<p>Internal Origin { Attributes of the organization }</p>	<p align="center">Strengths</p> <ul style="list-style-type: none"> • Leader in musculoskeletal health and our purpose is to help people get back to what they need and love to do as soon as possible and we all focus on doing such • Ability for everyone at our organization to work towards the same goals and take the responsibility for the collective success of the organization • Our foundation made up of our patient, research, education, community and culture. All five elements serve as our building blocks for the organization • Our Culture: Sets us apart from everyone else, deeply embedded values (excellence, integrity, teamwork, creativity and passion) 	<p align="center">Weaknesses</p> <ul style="list-style-type: none"> • Poor electronic automated data reporting and a poor process to prioritize new reports • Transition of our Chief Nursing Officer position in two weeks. Uncertain what changes our new CNO will make or expect. • External healthcare environment is quickly changing forcing us to maintain our own momentum to sustain ourselves. • Develop and update new pathways focused on diagnosis to help interdisciplinary team members understand steps that need to be followed through patient’s hospital stay and match to prescriber order sets, make it interactive as co-morbidities arise
<p>External Origin { Attributes of the organization }</p>	<p align="center">Opportunities</p> <ul style="list-style-type: none"> • Lead musculoskeletal research and innovation of new products and solutions in care delivery • We have a responsibility to continue learning and growing as the experts in musculoskeletal health and will leverage our knowledge and share it in a business model. • To attract and retain the best talent in the industry and assure we provide what is needed to fulfill our purpose. • We need to continuously raise the benchmark for quality and value for all indicators for patient care. 	<p align="center">Threats</p> <ul style="list-style-type: none"> • Competition everywhere- therefore it is crucial that we assure we develop new solutions to care delivery to maintain our top status. • Financial Health- we must maintain a robust financial health to allow us to sustain our resilience through challenging times. • We are expanding at a very fast pace, need to assure we do not lose our high outcomes and status

APPENDIX B**Study Interventions**

Risk Factors	Interventions
Cognitive Impairment	Reality Orientation through reading newspaper Therapeutic Activities Program: playing board games
Vision/ Hearing Impairment	Vision / hearing aids available at all times Adaptive equipment available
Immobilization	Early mobilization Minimizing immobilizing equipment (such as restraints)
Psychoactive Medication Use	Non-pharmacologic approaches to sleep/ anxiety Restricted use of sleeping medications
Dehydration	Early recognition Volume repletion
Sleep Deprivation	Noise Reduction Strategies Sleep Enhancement Program

Appendix C

Analysis of Literature

Citation	Research Question	Study Design	Independent Variable	Dependent Variable(s) (Or outcome)	Sample Size	Results
Chen, C.C., Lin, M.T., Tien, Y.W., Yen, C.J., Huang, G.H., Inouye, S.K., (2011)	<p>Primary Outcomes: Incidence of delirium?</p> <p>Change from baseline to discharge? Change from baseline to discharge: Better functional status, BI Score decline, better nutritional status, MNA score decline, Better cognitive function, MMSE score decline</p> <p>Secondary outcomes: Fewer depressive symptoms, reduced body weight, Grip strength.</p>	Clinical Trial Pre/Post Comparison	Full-time trained HELP nurse	Modified HELP protocol by full-time trained HELP nurse blinded to the study outcomes that was not an outcome assessor. This included: Early mobilization (ambulation or active range-of-motion exercise 3x/ daily), nutritional assistance, daily oral care, diet education and feeding assistance, therapeutic activities-orienting communication and cognitively stimulating activities 3x/ daily.	<p>Intervention Group: n= 102 (enrolled 5/2008 to 4/2009).</p> <p>Control Group: n= 77 (admitted 8/2007 to 4/2008)</p>	<p>The modified HELP intervention was successfully implemented and it ameliorated postsurgical functional decline and delirium rates for older patients undergoing common elective, abdominal surgical procedures.</p> <p>Receiving 7 days of the modified HELP Intervention prevented full functional loss in 2 to 3 ADLs or partial loss in function across more ADLs, Decreased weight loss by 30% and reduced delirium rates before hospital discharge, which are clinically important results.</p>
Deschodt, M., Braes, T., Flamaing, J., Detroyer, E., Broos, P., Haentjens, P., Boonen, S., Milisen, K.	Evaluate the effect of inpatient geriatric consultation teams on delirium and overall cognitive functioning in older adults with hip fracture to improve quality of care of older patients hospitalized on nongeriatric wards.	Controlled trial	Introduction of the inpatient geriatric consultation teams on senior patients who experience delirium	Improvement in incidence, severity, and duration of delirium and overall cognitive functioning as measured by using the Confusion Assessment Method (CAM)	171 people with a hip fracture, aged 65 or older, 94 assigned to a multidisciplinary geriatric intervention and 77 assigned to usual care	<p>Delirium can be prevented with the help of a multidisciplinary geriatric consultation team.</p> <p>The proportion of delirium postoperatively was significantly higher in the control group (53.2%) than in the intervention group (37.2%).</p> <p>Study limitations: patients were not</p>

						evaluated daily for delirium underestimating the incidence of postoperative delirium.
Inouye, S.K., Bogardus, S.T., Williams, C.S., Leo-Summers, L., Agostini, J.V. (2003)	Is HELP beneficial	Prospective, observational	all patients assigned to receive orientation, mobility, and therapeutic activities protocol other protocols include sleep, hearing or vision, and volume repletion	Implemented by Elder Life Specialists (trained hospital staff members) and assisted by trained volunteers. -overseen by a geriatric clinical nurse specialist and geriatrician	Intervention group: n= 422	Single group observational study, but multivariable analysis did not reveal confounding variables; no difference between included/ excluded subjects Participants may have been aware of the interventions/ protocols they received.
Lundström, M., Olofsson, B., Stenvall, m., Karlsson, S., Nyberg, L., Englund, U., Borssén, B., Svensson, O. Gustafson, Y.	Whether a post-operative multi-factorial intervention program can reduce delirium and improve outcomes in inpatients with femoral head fractures.	Randomized Interventionl Study. Patients were randomized to postoperative care in a geriatric ward with a special intervention program or to conventional care in an orthopedic ward, in opaque sealed envelopes.	1. Staff education focusing on assessment, prevention and treatment of delirium and associated complications. 2. The staff worked as a team, applying comprehensive geriatric assessment management and rehabilitation 3. The staffing at the intervention ward was 1.07 nurses / aide per bed.	1. Reduce delirium 2. Improve outcome in patients with femoral neck fractures.	One hundred and ninety-nine patients, 102 in the intervention and ninety-seven in the control group; aged seventy years and over (mean age +/- SD, 82 +/- 6, 74% women).	The number of days of postoperative delirium among intervention patients was fewer (5.0, +/- 7.1 days vs. 10.2 days, +/- 13.3 days, p= 0.009) compared with controls. A lower proportion of intervention patients were delirious postoperatively than controls (56/ 102 54.9%, vs. 73/97, 75.3%, p= 0.003). Eighteen percent in the intervention ward and fifty % of controls were delirious after the seventh postoperative day (p < 0.001). Intervention patients suffered from fewer complications, such as decubitus ulcers, urinary tract infections, nutritional complications, sleeping problems and

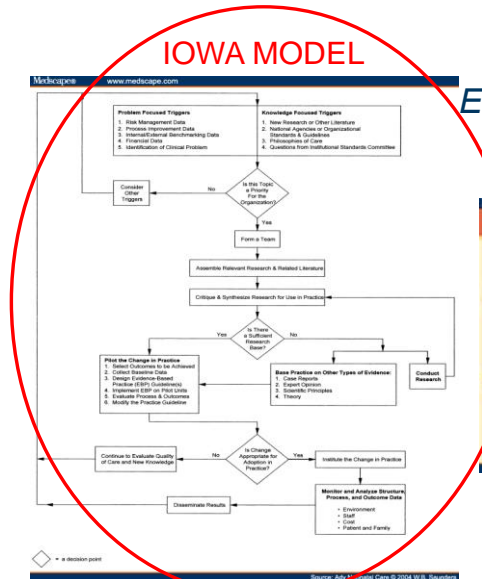
						falls, then controls. Total postoperative hospitalization was shorter in the intervention ward (28.0, 0 +/- 17.9 days vs. 38.0, +/- 40.6 days, p= 0.028).
Martinez, F., Tobar, C., Beddings, I., Vallejo, G., Fuentes, P.	To assess the efficacy of multicomponent interventions in delirium prevention.	Single blinded, randomized controlled trial.	Non-pharmacologic intervention performed thoroughly by patient's family members to assist healthcare personnel: Includes: 1. educating family 2. provision of a clock and calendar in the room 3. avoidance of sensory deprivation (glasses, dentures and hearing aids) 4. Presence of familiar objects in the room (photos) 5. reorientation of patient provided by family members 6. extended visitation times (at least 5 hours daily)	Reduce the incidence of delirium during the course of hospitalization	287 patients: 144 were enrolled in the treatment group 143 in the control group the study was made up of mainly female patients (62.7%) with a mean age of 78.2 years old.	In the treatment group, which received the intervention, delirium developed in 8 cases, while the control group developed 19 episodes of delirium. No significant differences in the median length of hospitalization were seen. Four falls were reported during follow-up, all of which occurred in the control group.
McCaffrey, R.	Is there a difference in cognitive function as measured by the Mini-Mental State Exam, or in the amount of acute confusion as measured by the NEECHAM Acute Confusion Scale in older adults who listen to music following hip or knee surgery when compared to those who do not	Randomized Controlled Study	Experimental group listened to a CD of soothing lullaby music which played continuously on a CD player upon arrival to the unit. Once awake, they had a choice of music to listen to. The CD was set up to play 4X/ day.	Normal cognition in older adults evaluated each day for first three postoperative days	Twenty-Two patients Aged 65 years or older (Median age 75) 11 in the experimental group 11 in the control group Gender: 5: Male 7: Female	The control group had a greater decline in cognition immediately after surgery, which improved on postoperative day 2 and 3. The experimental group had lower levels of acute confusion on all three postoperative days compared to the control group. Even though the control group did show improvement,

						<p>their NEECHAM score remained lower than the experimental group all three days.</p> <p>The study demonstrated improved cognition when using music in older patients.</p> <p>Limitations: small sample size and one hospital population</p>
<p>Rubin, R.H., Williams, J.T., Lescisin, D.A., Mook, W.J., Hassan, S., Inouye, S.K. (2006)</p>	<p>Can HELP can be successfully replicated in a community hospital, yielding clinical and financial benefits</p>	<p>Pre/ post test QI Study</p>	<p>Hospital Elder Life Program: Daily interventions targeted patients were not delirious and who were at intermediate risk for developing delirium.</p>	<p>Deviations from the original HELP model: -exercise and fluid repletion protocols omitted due to insufficient staffing -sleep protocol modified -the role of the nurse practitioner was modified to eliminate redundancies with existing services.</p>	<p>Intervention Group: n= 704 mean age: 80.9 (6.7)</p> <p>n= 1, 225 mean age: 80.6 (6.2)</p>	<p>Outcome assessors not blinded</p> <p>Pre/post design: cohorts were assessed at different time periods and thus there may be other confounding variables.</p> <p>Delirium assessment tool not described</p>
<p>Watne, L., Torbergsen, A., Conroy, S., Engedal, K., Frihagen, F., Hjorthaug, G., Juliebo, V., Raeder, J., Saltvedt, I., Skovlund, E., Wyller, T.</p>	<p>What is the effect of a pre and postoperative orthogeriatric service on the prevention of delirium and longer-term cognitive delirium?</p>	<p>Randomized controlled, single-blind trial</p>	<p>The intervention consists of early mobilization, physiotherapy sessions, daily medication reviews, early mobilization, optimizing nutrition and early discharge planning. Control group received routine care.</p>	<p>Improvement in delirium.</p>	<p>332 patients Aged 85 years or older \163 in the intervention group and 166 in the control group</p> <p>After end of a four-month study: 297 completed study: 35 had not completed the study</p>	<p>There was no difference in delirium rates between the intervention and control groups. There was no difference in delirium duration (3 vs. 4 days). Fewer patients discharged from the orthogeriatric service unit was discharged with ongoing delirium (15% vs. 26%).</p> <p>The trial found no evidence that cognitive function four months after surgery improved in patients treated with pre and postoperative</p>

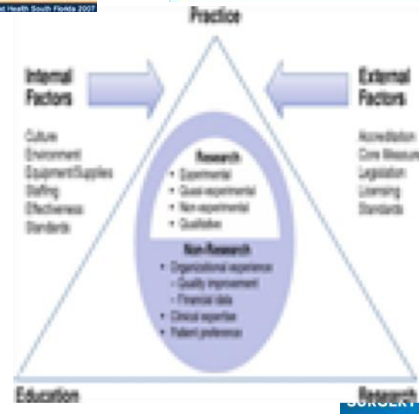
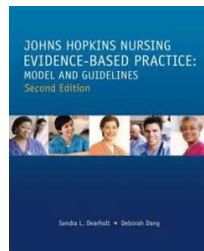
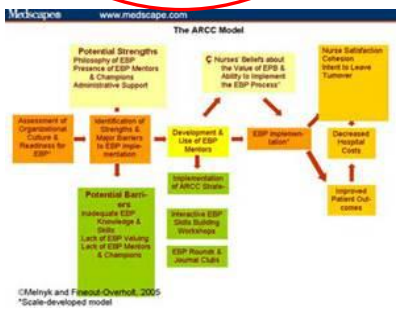
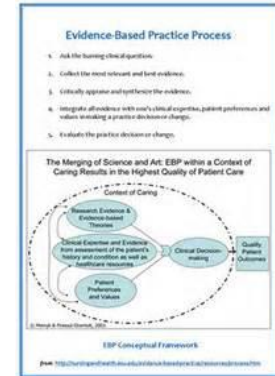
						orthogeriatric care provided in an acute geriatric ward compared to usual care.
Zaubler, T.S., Murphy, K., Rizzuto, L., Santos, R., Giordano, J., Bustami, R., Inouye, S.K., (2013)	Patients developing incident of delirium during first 7 days after admission?	Pre-Post Design (Quality Improvement Study)	Patients with confusion	Patients received interventions from the Elder Life Specialists or volunteers, on weekdays, 5 days per week, adapted from the original HELP model. Exercise/ mobility protocol was omitted because of staffing limitations. HELP program interventions included: Daily visits, Therapeutic activities, Feeding assistance, Hydration assistance, Vision/ hearing.	Intervention: n= 380 mean age: 83.2	HELP can be successfully adapted for implementation in a community hospital setting to decrease delirium episodes, total patient days with delirium and LOS, and generate substantial cost savings.

APPENDIX D

EBP Transition Model

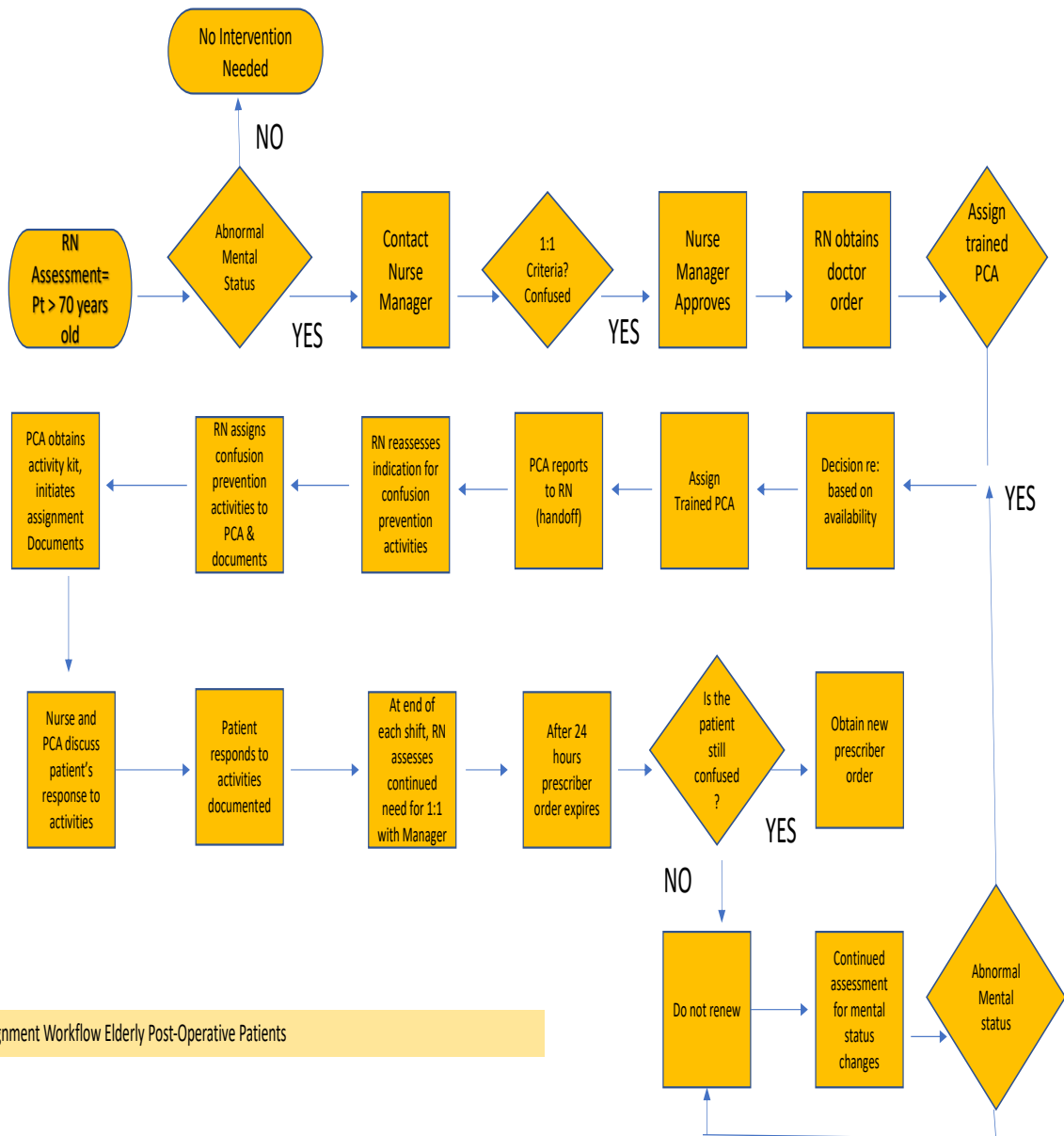


EBP Models



APPENDIX E

Study Recruitment



1:1 Assignment Workflow Elderly Post-Operative Patients

APPENDIX F

Hospital for Special Surgery
Institutional Review Board
535 East 70th Street
New York, NY 10021
(212)606-1238

NOTIFICATION OF INITIAL APPROVAL

To: [Patricia Quinlan, Ph.D.,MPA,CPHQ](#)
From: [Edward C. Jones, MD, MA](#)
[Rosemarie Gagliardi](#)
Re: Study# [2019-1657](#)
Mitigating Delirium Postoperatively

45 CFR 46.104(d) (4) Secondary research for which consent is not required: Secondary research uses of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met: **(ii)** Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects;

Date: 8/27/2019

I am pleased to inform you that your Exempt Application was approved on 8/26/2019. This approval will expire on 8/25/2022.

This study doesn't require continuing review. The Principal Investigator is responsible for notifying the IRB, via ECAP amendment application, of any changes to this original approved protocol and any additions or deletions to the original list of investigators on the protocol. Changes in the above referenced research project cannot be initiated without prior IRB approval. In additional, please notify the IRB when study is completed by submitting via Continuing review application in ECAP a final report/study completion.

Thank you,

APPENDIX G

Activity Kit

SIT KIT

Conversation Cards

Lavender Scented Lotion

P Care How To Instruction Card

Trivial Pursuit

Fidget Spinners

Chamomile Tea Bag

News Articles

Fidget Cubes

CREATED USING **POWTOON**

APPENDIX H**Study Interventions**

Risk Factors	Interventions
Cognitive Impairment	Reality Orientation through reading newspaper Therapeutic Activities Program: playing board games
Vision/ Hearing Impairment	Vision / hearing aids available at all times Adaptive equipment available
Immobilization	Early mobilization Minimizing immobilizing equipment (such as restraints)
Psychoactive Medication Use	Non-pharmacologic approaches to sleep/ anxiety Restricted use of sleeping medications
Dehydration	Early recognition Volume repletion
Sleep Deprivation	Noise Reduction Strategies Sleep Enhancement Program

APPENDIX I

Study Outcomes

Outcomes	Definition/ Measure
Total Number of Hours Patients are Considered Confused/ Delirious	This will count from the start of the 1:1 order to the discontinuation of the 1:1 order
Patient Length of Stay (LOS)	Does the average LOS, number of minutes/ hours, decrease after interventions are implemented? Measure pre and post intervention LOS for patients (> 70 years old) on 1:1 This will be completed through a report created and run by electronic medical record (Epic)
Number of adverse patient events during their confusion/ delirious phase	This will be monitored through an Epic report
Hours of 1:1 sitter per patient	This will be monitored though an Epic report
Hours of 1:1 sitter per patient and types of interventions utilized	Will be monitored through an Epic report
Use of psychotropic medications and/ or pain medications administered	This will be monitored through an Epic report