Screening for Delirium in Long Term Care Settings

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List of Abbreviations

CAM	Confusion Assessment Method
DAP	Delirium Abatement Program
DNP	Doctor of Nursing Practice
LTC	Long Term Care
NICE	National Institute for Health and Care Excellence
PDSA	Plan, Do, Study, and Act
SNF	Skilled Nursing Facility

Chapter I: Introduction

Background

Delirium is considered an acute confusional state that is often preventable. It is a treatable clinical syndrome if diagnosed early. However, if left unrecognized, undiagnosed, and therefore untreated it can result in a multitude of negative consequences for the patient, their family, and the organization providing care. Although delirium is a common problem in all healthcare settings, the ramifications and complications associated with its development are much more prevalent in post-acute care facilities such as skilled nursing facilities (SNFs) (Kwapis, 2009). Currently, it is estimated that delirium affects 60%-70% of patients within the long term care (LTC) setting, and post-acute care settings (Cole et al., 2012a; de Lange, Verhaak, & van der Meer, 2013; Inouye, 2006; McCusker et al., 2011a; Solberg & Jewett, 2014; Voyer, Richard, Doucet, Danjou, & Carmichael, 2008). However, it is estimated that only 2.2% of cases are being diagnosed in the LTC setting (de Lange et al., 2013). According to Solberg and Jewett (2014), clinicians within LTC facilities fail to accurately recognize delirium in more than 70% of cases. Therefore, delirium often goes undiagnosed, and is significantly undertreated. The cost of delirium per patient episode is estimated at $60,000. As of 2011, it is estimated that the healthcare costs associated with delirium in the United States range from $143-152 billion annually (Leslie & Inouye, 2011).

Problem Statement

The development of delirium is a common, serious, and costly process for the patient, their family, and the organization providing care (Hospital Elder Life Program, 2016c). The development of delirium is a common occurrence in all hospital settings (Anderson, Ngo, & Maracantonio, 2012). Upon discharge, delirium can persist within LTC settings, such as

SNFs, for several weeks to months. Currently, it is estimated that 30-40% of delirium cases can be prevented through proper screening (Fong, Tulebaev, & Inouye, 2009; Leslie & Inouye, 2011). However, there is a gap between what is known about delirium, and the implementation of scientifically proven evidence-based measures, such as screening for delirium with the Short CAM scale. Consistent implementation of the CAM scale promotes early recognition of delirium, and can ultimately improve patient outcomes (Fong et al., 2009). Furthermore, while there is a substantial body of literature addressing delirium in the acute care setting, there is a paucity pertaining to the LTC setting. Although the CAM scale is being used with great success to identify delirium on acute care units within the hospital setting, and in the intensive care unit (ICU), its use in long term settings such as SNF, is markedly decreased (Cole et al., 2011; Cole et al., 2012a; de Lange et al., 2013; Kwapis, 2009; McCusker et al., 2011a; McCusker et al., 2011b; Voyer et al., 2008). This is problematic as the patients who are receiving LTC are frequently diagnosed with severe debility or critical illness myopathy upon admission due to experiencing a complicated and prolonged acute hospitalization, which predisposes them to the development of delirium (Anderson et al., 2012).

According to the American Delirium Society (2013), individuals who develop delirium in the hospital setting have a 47% probability of requiring LTC upon discharge, versus those who do not develop delirium in the hospital setting having an 18% LTC rate upon discharge. The potential negative outcomes associated with delirium include (a) the potential for prolonged cognitive impairment extending months beyond the initial diagnosis; (b) increased morbidity and mortality; (c) decreased functional capacity and independence; (d) prolonged immobility and hospitalization; (e) higher healthcare costs; (f) increased use of chemical and

physical restraints; (g) unnecessary psychosocial stress on the patient and their family; (h) an increased potential for long term nursing home placement; and (i) an increased risk of developing dementia (Hospital Elder Life Program, 2016d; Leslie & Inouye, 2011). According to Leslie and Inouye (2011), individuals who develop delirium lose on average 13% of a year of life. Delirium is also associated with an in-hospital mortality rate of 25-33%, and a one year mortality of 35-40% (Cole et al., 2012b; Fong et al., 2009; Hospital Elder Life Program, 2016c; Inouye, 2006; Kwapis, 2009; Leslie & Inouye, 2011; McCusker et al., 2011a; Rice & Castex, 2013). The focus of this project was to explore timely and accurate identification of delirium within the LTC setting, using a standardized screening tool, such as the Short CAM scale, to improve the quality of care delivered, and patient outcomes.

Purpose of the Project

The purpose of the Doctor of Nursing Practice (DNP) scholarly project focused on improving the recognition and detection of delirium within the SNF of a metropolitan, not for profit, community owned hospital in a southern state. This was facilitated through the routine implementation of a delirium screening protocol, specifically the Short CAM scale, within 24 hours of admission to the SNF. The project evaluated (a) if consistent implementation of the Short CAM scale improved early recognition and diagnosis of delirium; (b) whether the Short CAM scale was completed on each new admission within the recommended 24 hours; (c) whether healthcare providers were notified of positive Short CAM scale results and were supportive and diagnostic treatment measures implemented; and (d) how many participants were subsequently diagnosed with delirium by healthcare providers.

Specific Aims of the Project

The specific aims of the project were to initiate timely and effective recognition of delirium cases through routine use of the Short CAM scale for all consenting participants who were admitted to the SNF during the project implementation phase. The goal of this project was to improve the recognition and diagnosis of delirium for patients admitted to the SNF. Achieving this goal was determined by evaluating (a) how many patients on the SNF were identified as exhibiting symptoms of delirium as indicated by a positive Short CAM scale result; (b) monitoring and evaluating if healthcare providers were notified of positive Short CAM scale results; (c) evaluation of how many patients were accurately diagnosed with delirium by healthcare providers; and (d) evaluation of whether or not the Short CAM scale was completed on each new admission within the recommended 24 hours.

Conceptual Framework

The conceptual framework used to guide project development was the Deming Cycle, which is commonly referred to as the Plan, Do, Study, and Act (PDSA) model (Minnesota Department of Health, n.d.). The PDSA model is a cycle improvement model that consists of four stages. When employed, the PDSA model improves current processes and facilitates change. Upon implementation of the PDSA model it is important to take into account the opinions of internal and external consumers (Minnesota Department of Health, n.d.).

Stage one of this model is the Plan stage, in which a team was assembled to participate in the delirium project. During this stage, the roles and responsibilities of individual team members was determined, and a time table for project implementation was developed. During the second stage of planning, an aim statement was developed, which signified what the project was to accomplish, and how it will result in improvement of

current practices. The third step in the Plan phase is to evaluate the existing processes (Minnesota Department of Health, n.d.). Prior to implementation of the project within the identified SNF there was no process in place to screen patients for delirium, therefore, this diagnosis was often overlooked. The final steps in the Plan phase was to describe the problem, and identify potential causes, and alternatives (Minnesota Department of Health, n.d.). The Plan phase was developed in the spring of 2015.

Stage two of the PDSA model is the Do stage in which the action plan is implemented (Minnesota Department of Health, n.d.). This stage took place between August and December of 2015, when the delirium project was implemented in its entirety on the SNF unit. Stage three of this model is the Study phase in which one determines if the intervention was effective in producing an improvement in patient outcomes. During this stage, one will determine if the project was worth the investment, and if any unexpected side effects occurred (Minnesota Department of Health, n.d.). This stage took place between January and May of 2016, when the project was evaluated for effectiveness, and outcomes were measured. The fourth and final stage of this model is to Act. During this stage the team reflects on the project in order to determine its success (Minnesota Department of Health, n.d.). This stage also took place in the spring of 2016. Based on success of the project, the next step in the Act phase is to standardize the process. This will be accomplished through a recommendation for the creation of a new unit policy, which will ensure that all new admissions to the SNF are adequately screened for delirium within 24 hours of admission.

Chapter II: Synthesis of the Literature

Introduction

The following portion of this paper serves as a comprehensive literature review of the available evidence on the often preventable, but potentially catastrophic diagnosis of delirium. The key concepts and themes that surround delirium are presented, along with a review of supporting data regarding the importance of proper screening and recognition, especially within LTC settings such as SNFs. In addition, gaps in the current literature will be explored to identify inconsistencies related to what is known about delirium, and what is actually occurring in everyday practice with regards to screening, early recognition, and diagnosis.

State of the Evidence

Background of delirium.

Chadwick's work (as cited in Fong et al., 2009), revealed that delirium was first used as a medical term in the first century AD. During this time period, delirium implied the presence of mental incapacities that occurred as a result of fever or head trauma (as cited in Fong et al., 2009). A multitude of terms have been used over the years to describe delirium. These include acute confusional state, altered mental status, acute lethargic state, acute brain syndrome, and toxic-metabolic encephalopathy (Fong et al., 2009; Solberg & Jewett, 2014). According to current literature, use of the above terms is common, and as such contributes to failure to accurately recognize and diagnose delirium (Fong et al., 2009).

Delirium, classified as a neurocognitive disorder, is defined as the acute development of severe confusion, which can be associated with hyperactivity, illusions, and hallucinations (American Psychiatric Association, 2013).

The American Psychiatric Association's (2013) diagnostic criteria for delirium include:

> (a) a disturbance in inattention, for example, reduced ability to direct, focus, sustain, and shift attention, and awareness; (b) the disturbance develops over a short period of time, usually hours to a few days, represents a change from baseline attention and awareness, and tends to fluctuate in severity during the course of the day; (c) an additional disturbance in cognition, for example, memory deficit, disorientation, language, visuospatial ability, or perception; (d) the disturbances in criteria A and C are not better explained by another preexisting, established, or evolving neurocognitive disorder and do not occur in the context of a severely reduced level of arousal, such as coma; and (e) there is evidence from the history, physical examination, or laboratory findings that the disturbance is a direct physiological consequence of another medical condition, substance intoxication or withdrawal, or exposure to a toxin, or is due to multiple etiologies. (p. 596)

During episodes of delirium, the patient is often out of touch with reality and their surroundings, and may experience rapid shifts from one emotional state to another. Often, there is a change in cognition, which manifests as emotional disturbances (American Psychiatric Association, 2013). According to the American Psychiatric Association (2013), "the individual with delirium may exhibit emotional disturbances such as: (a) anxiety; (b) fear; (c) depression; (d) irritability; (e) anger; (f) euphoria; and (g) apathy" (p. 600).

Risk factors for the development of delirium.

An estimated 14-56% of hospitalized patients will develop delirium at some point during admission, whereas delirium is present in only 1-2% of the general population (Fong

et al., 2009; Inouye, 2006; Leslie & Inouye, 2011). The prevalence of delirium is highest among hospitalized elderly patients, affecting 14% of those over the age of 85. Delirium also commonly occurs in patients who have undergone surgery affecting 15-53% of these individuals. Patients who have received care in the ICU have a high rate of delirium, estimated at 70-87%. Individuals who are hospitalized in sub-acute units such as SNF and palliative care units have delirium rates as high as 70% (Fong et al., 2009; Inouye, 2006).

Several modifiable and non-modifiable risk factors are related to the development of delirium. Modifiable risk factors are those that can be controlled and include (a) sensory deficits; (b) polypharmacy; (c) environmental aspects; (d) presence of indwelling medical devices; (e) fever; (f) inadequate hydration and nutrition; (g) the presence of an acute illness; and (h) the use of physical restraints (Arinzon, Peisakh, Schrire, & Berner, 2011; Beary, 2013; Fong et al., 2009; Grover et al., 2013). Non-modifiable risk factors for the development of delirium cannot be controlled and include (a) advanced age; (b) chronic pathology such as cardiac and pulmonary disease; (c) preexisting cognitive impairment such as dementia; (d) chronic immobility; (e) male sex; and (f) chronic renal or hepatic disease (Arinzon et al., 2011; Beary, 2013; Fong et al., 2009; Grover et al., 2013).

Etiologic factors contributing to risks.

According to an extensive review of the literature, delirium has multiple common etiologies. These include (a) drug effects particularly those of narcotics, sedatives, and anticholinergics; (b) electrolyte/metabolic imbalances; (c) infection, particularly pneumonia and urinary tract infections; (d) organ insufficiency; (e) prolonged ICU stay and mechanical ventilation; (f) hypoxemia; (g) anemia; (h) surgery; and (i) prolonged sleep deprivation (Arinzon et al., 2011; Brooks, Spillane, Dick, & Stuart-Shor, 2014; de Lange et al., 2013;

Grover et al., 2013; Henao-Castano & Amaya-Rey, 2013; Inouye, 2006; Shadvar, Baastani, Mahmoodpoor, & Bilehjani, 2013). According to Grover et al. (2013), the most common etiology for delirium was metabolic and endocrine disorders at 77%, followed by organ insufficiency at 24.8%, systemic infections at 20.5%, and drug withdrawal at 12%. Similarly Henao-Castano and Amaya-Rey (2013), identified metabolic disturbances and infection as common etiologies of delirium in addition to acidosis, hypotension, hypoxemia, and anemia. Interestingly, Arinzon et al. (2011) identified metabolic disturbances occurring at 36%, and infection at 58% as the most predominant etiologies for delirium, followed by drug effects at 18%.

Consequences and sequelae of delirium.

The consequences and sequelae of delirium can have lifelong effects on the patient, and their family. Currently, delirium accounts for 17.5 million inpatient hospital days (Inouye, 2014). According to the Hospital Elder Life Program (2016d), 29-54% of hospitalized elderly patients will develop delirium at some point. The development of delirium is a common occurrence in all hospital settings. Upon discharge delirium can persist within LTC settings such as SNF for weeks to months (Anderson et al., 2012).

Among older patients, delirium is considered the most prevalent, yet manageable medical emergency that when left untreated results in severe consequences (Varghese, Macaden, Premkumar, Mathews, & Kumar, 2014). Delirium is associated with a multitude of poor clinical outcomes that can have long lasting effects to patients and their caregivers, and the organization providing care. These include (a) increased morbidity and mortality; (b) increased length of hospitalization; (c) persistent cognitive and functional decline and impairment; (d) increased risk for long term nursing home placement; (e) increased risk of

dementia; (f) increased risk of falls; (g) increased cost of care; and (h) increased per patient nursing time (Cole et al., 2012b; Fong et al., 2009; Hospital Elder Life Program, 2016d; Kwapis, 2009; Leslie & Inouye, 2011; McCusker et al., 2011a; Rice & Castex, 2013). Frequently, the complications associated with delirium that arise during an acute hospitalization extend into the LTC setting. According to Cole et al. (2012b), it is estimated that patients who are admitted to LTC facilities such as SNF, with a diagnosis of delirium, had symptoms that persisted for two to four weeks. In a study conducted by Arinzon et al. (2011), which observed delirium in the LTC setting, the mean duration of delirium was estimated at 16 days, with a range of up to 96 days. According to Sarutzki-Tucker and Ferry (2014), delirium typically persists for approximately 7 days, however, return to baseline mental status may take several weeks. In a study conducted in eight Boston SNFs, it was noted that in 56% of participants, delirium persisted one month after admission (Anderson et al., 2012).

Although delirium is considered a preventable condition, it continues to occur at a high rate within LTC settings (Anderson et al., 2012; Cole et at., 2012a; McCusker et al., 2011a; Voyer et al., 2008). Estimates from studies conducted in the United States and Sweden reveal that 7-58% of patients in LTC facilities are diagnosed with delirium upon admission (McCusker et al., 2011a). According to a multi-site study of LTC facility residents in Canada, the prevalence of delirium ranged from 7.1% to 33%. This same study revealed that 82 of the 246 residents were noted to have at least one episode of delirium at follow-up (McCusker et al., 2011a). Another study conducted in three LTC facilities in Canada revealed that 71.5% of participants were diagnosed with delirium, however, only 13% of cases were detected by nurses (Voyer et al., 2008). According to an observational study

conducted in eight SNFs in Boston, 14% of participants were diagnosed with delirium (Anderson et al., 2012).

Although delirium is typically transient and reversible, it can lead to persistent cognitive impairment. Sarutzki-Tucker and Ferry (2014), have identified a number of associations related to delirium. First, time to recovery and overall prognosis is directly dependent upon the duration of delirium. Delirium that persists beyond 3 months is associated with irreversible, long lasting cognitive impairment, and a markedly increased risk of death. Finally, patients with persistent delirium are three times more likely to succumb to this process within one year as compared to those in which delirium resolves (Sarutzki-Tucker &Ferry, 2014).

In addition to the morbidities associated with delirium, the development of delirium is directly correlated with an increased risk of mortality. According to the American Delirium Society (2013), one month mortality rates in those with delirium as compared to those without delirium are 14% versus 5% respectively. At six months, mortality increases from 11% in those without delirium to 22% in those suffering with delirium (American Delirium Society, 2013). The two year mortality rate increases from 28% in those without delirium to a striking 38% in those with delirium (American Delirium Society, 2013).

Barriers to diagnosis.

Several barriers to diagnosing delirium have been consistently identified in the literature. These include provider knowledge and mistaken diagnoses. Each of these barriers will be discussed in detail below.

Provider knowledge.

Although an extensive amount of data exists regarding the consequences of delirium, and the importance of proper screening and early recognition, this potentially fatal condition is markedly unrecognized within LTC settings, such as SNF. This is partially due to the fact that there are no diagnostic tests currently available for a definitive delirium diagnosis (Sarutzki-Tucker & Ferry, 2014). Therefore, accurately screening for delirium requires that healthcare providers are aware of standardized tools, such as the Short CAM scale, which specifically identifies criteria that aids in the diagnosis of delirium (Fong et al., 2009). One of the most common themes noted in all the literature as to why there is decreased recognition is that there is a general lack of provider awareness and knowledge regarding the signs and symptoms of delirium, and the importance of early recognition and diagnosis (Kwapis, 2009; McCusker et al., 2011a; Steis & Fick, 2008).

The under-recognition of delirium by healthcare providers is well documented within the literature. Currently, it is estimated that 75% of nurses, and 25% of physicians and midlevel providers fail to recognize the symptoms of delirium, therefore it often goes undetected and undiagnosed (Beary, 2013; Hospital Elder Life Program, 2016d; Rice et al., 2011; Varghese et al., 2014). A study conducted by Inouye, Foreman, Mion, Katz, and Cooney (2001), revealed that nurses were only able to detect delirium in 31% of patients who developed this healthcare associated complication. According to the American Delirium Society (2013), 60% of delirium cases are unrecognized within the healthcare setting. A study conducted by Rice, Bennett, Clesi, and Linville (2014), revealed that nurses only recognized delirium in 23% of cases.

Under-recognition of delirium is particularly evident in SNF settings where it has been documented that healthcare providers generally lack knowledge regarding the signs and symptoms of delirium, approaches that can be used to promote early recognition, and the importance of this avoidable condition (Kwapis, 2009; Solberg & Jewett, 2014; Voyer et al., 2008). A study conducted in three LTC facilities in Canada revealed that nurses were only able to accurately detect delirium in 13% of participants (Voyer et al., 2008).

A systematic review by Steis and Fick (2008), regarding nurse's recognition of delirium, revealed that nurses did not perform a thorough cognitive evaluation, or accurately report their patients mental status to physicians. According to Solberg and Jewett (2014), nurses failed to alert physicians in 33% of patients noted to be delirious. One of the primary reasons that nurses fail to notify providers of suspected delirium is their inability to recognize the often subtle symptoms of delirium due to a general lack of awareness and knowledge regarding this preventable process, and failure to accurately assess patients' cognitive status (Kwapis, 2009; McCusker et al., 2011a; Steis & Fick, 2008).

Mistaken diagnosis.

If recognized at all, delirium is often mistaken for dementia. A primary difference between delirium and dementia is that dementia has a vague and insidious onset where symptoms progress slowly over time, and can go unnoticed for years. Delirium however, is characterized by an acute onset, usually developing rapidly over several hours or days (American Psychiatric Association, 2013). Delirium that is superimposed on dementia often goes undiagnosed and as such has dire consequences (Beary, 2013; Phillips, 2013). It is crucial for healthcare providers to be able to accurately differentiate between these two diagnoses. Delirium symptoms are most pronounced shortly after initial presentation (Grover

et al., 2013). One primary reason that delirium is unrecognized in the LTC setting is that physicians, midlevel providers, and nursing staff frequently mistaken it for worsening dementia (Beary, 2013; Fong et al., 2009; Sarutzki-Tucker & Ferry, 2014; Solberg & Jewett, 2014). Patients who are experiencing delirium do not present with the gradual decline in memory function and behavior changes that those with dementia experience (American Psychiatric Association, 2000). Patients who develop delirium will often exhibit fluctuations in their symptoms throughout the day, with symptoms worsening at night (American Psychiatric Association, 2013; Beary, 2013).

Social and economic costs of delirium.

From a quality improvement standpoint, there is clearly a need to increase the implementation of proven and standardized screening tools such as the Short CAM scale within LTC settings such as SNFs (Voyer et al., 2008). In recent years, the development of delirium has been positively correlated with a genuine lack of quality healthcare, and is identified by the Agency for Healthcare Research and Quality (AHRQ) as one of three conditions that require drastic improvement in terms of improving the quality of care delivered in all healthcare settings, including LTC (Inouye, 2006). According to Dr. Hospitalist (2008), the development of delirium while hospitalized is considered a complication, and therefore is identified as one of several hospital acquired conditions for which the Centers for Medicare and Medicaid services is considering that organizations not receive monetary reimbursement for its development. This is significant as delirium in the United States alone is estimated to cost up to $152 billion annually (Leslie & Inouye, 2011).

According to the Society for Post-Acute and LTC Medicine (n.d.), the development of delirium in short stay skilled nursing home settings has become a quality improvement

initiative. Delirium is also being examined on an international level as a safety and quality of care issue. For example, the Australian Commission on Safety and Quality in Healthcare (2015), is in the process of finalizing a delirium clinical care standard.

The societal and economical costs of delirium are astronomical. Among elderly patients, it is estimated that the development of delirium complicates hospitalization for over 2.6 million individuals annually (Hospital Elder Life Program, 2016c). The Medicare costs associated with delirium alone are estimated at greater than $8 billion annually (Kwapis, 2009). As of 2011, it is estimated that the healthcare costs associated with delirium in the United States range from $143-152 billion annually, with an average annual hospital cost of greater than $11 billion. This is significant as the annual cost of delirium is more than that of diabetes mellitus, which averages $91.9 billion; hip fractures, which costs $7 billion annually; and non-fatal falls, costing $19 billion (Leslie & Inouye, 2011). This estimate includes the costs incurred during hospitalization and upon discharge. Patients who experience delirium often require extensive LTC, and institutionalization until their mental status and physical function returns to baseline, which could extend for several months beyond initial diagnosis (Kwapis, 2009). According to the American Delirium Society (2013), one episode of delirium extends hospitalization time from 9 to 21 days per patient.

Based on the above estimates, it is clear that delirium is a significant diagnosis that deserves the attention of all healthcare providers as it produces unnecessary, yet substantial healthcare costs. Delirium decreases productivity in healthcare workers as it increases the overall nurse to patient time ratio, and often requires that the organization provide the presence of a 24 hour sitter to monitor the behavior of delirious patients, further adding to the overall costs (Fong et al., 2009). Patients who develop delirium also suffer immensely due to

the prolonged cognitive impairment, post-traumatic stress, and marked functional decline that can accompany this process (Fong et al., 2009; Hospital Elder Life Program, 2016d; Leslie & Inouye, 2011). The development of delirium also effects the patient's family members as it creates a substantial amount of caregiver burden (Hospital Elder Life Program, 2016d).

Risk reduction and patient safety.

Delirium is one of the most common adverse events that occurs within the healthcare setting, affecting individuals who are acutely ill, and those receiving care on sub-acute units such as SNFs (Arinzon et al., 2011). Symptoms of delirium, which often mask underlying life-threatening situations, are present in 10-30% of elderly patients who are evaluated in the emergency room setting, and in 14-24% of patients at the time of general hospital admission (Fong et al., 2009; Inouye, 2006). According to Fong et al. (2009), in the United States, it is estimated that 20% of patients 65 years of age and older will suffer with complications that are directly related to the development of delirium. Often, these complications persist after hospital discharge, and into the LTC setting, thus adding to overall costs (Fong et al., 2009). The development of delirium predisposes patients to an increased risk of developing dementia (Hospital Elder Life Program, 2016d). Sixty three percent of patients who suffer with delirium will develop dementia within 4 years (American Delirium Society, 2013).

National Guidelines and Recommendations for Screening Tools

According to the National Guideline Clearinghouse (2009), although several tools and scales exist in regards to delirium, the CAM scale is the only tool that is actually considered diagnostic for delirium. Other scales and instruments that are currently in use in regards to delirium include the Delirium Index, and the Delirium-O-Meter (DOM), both of which are used to determine the severity of delirium (National Guideline Clearinghouse, 2009). The

Mini-Mental State Examination is used to assess mental status, whereas the Mini-Cog is a screening tool that assesses cognitive impairment (National Guideline Clearinghouse, 2009). The purpose of the Neelon and Champagne (NEECHAM) confusion scale is to measure the level of confusion (National Guideline Clearinghouse, 2009). Finally, the Form for Documenting Predisposing and Precipitating Factors for Delirium is used strictly as a way to document an individualized plan of care, and to identify interventions that can decrease the contributing factors of delirium (National Guideline Clearinghouse, 2009). All of the above scales have proven useful to the study of delirium. However, the CAM scale is the only instrument that is dedicated to both the recognition and diagnosis of delirium (National Guideline Clearinghouse, 2009).

Another guideline, titled *Delirium and acute problematic behavior in the LTC setting,* (National Guideline Clearinghouse, 2008), supports routine use of the CAM scale as an accurate tool to identify, recognize, and confirm the presence of delirium. The primary objective of this guideline is to improve the quality of care that long term residents receive by providing healthcare practitioners with an organized method for recognizing and accurately assessing delirium. This guideline specifically recommends consistent use of the CAM scale as a diagnostic instrument for delirium. Potential benefits of this guideline, and use of the CAM scale for early identification of delirium include the prevention of unnecessary hospitalizations, optimizing clinicians approach to delirium, and avoiding delays in the recognition and management of delirium (National Guideline Clearinghouse, 2008).

The guideline, titled *Delirium: Diagnosis, prevention and management,* published in 2010 by the National Guideline Clearinghouse, specifically supports the use of the Short CAM for early identification and diagnosis of delirium in the hospital, or in LTC settings

such as SNF. This guideline supports performing routine assessments for the risk factors that are associated with the development of delirium. These include patients over the age of 65, history of past or present cognitive impairment or dementia, current hip fracture, or severe illness. In the event any of the above risk factors are identified, patients should then be routinely screened for delirium with the Short CAM scale. This scale also recommends daily observation of all hospitalized patients, or those in LTC settings for symptoms of delirium to promote early recognition and diagnosis (National Guideline Clearinghouse, 2010a).

Nurses, physicians, and midlevel providers in all settings demonstrate consistently low rates of detecting, reporting, and diagnosing the presence of delirium. The guideline titled *Screening for delirium, dementia and depression in older adults,* published by the National Guideline Clearinghouse (2010b), advocates for improving how older adults are screened and assessed for delirium, dementia, and depression. This guideline incorporates 11 practice recommendations related specifically to nurses and the detection of delirium. The recommendations in this guideline support the increased need for nurses to have general knowledge regarding delirium, proper screening techniques, and have the ability to recognize and decipher symptoms of delirium from other cognitive impairments. Recommendations in this guideline include that nurses are aware of, and maintain a high suspicion for delirium in older adults, routinely screen for delirium and changes in cognition using a standardized tool such as the CAM scale, recognize that delirium, dementia, and depression symptoms can overlap, and must report positive delirium screening results to physicians or midlevel providers who can assess the patient, and make an accurate diagnosis (National Guideline Clearinghouse, 2010b).

Eleven research articles were reviewed that pertained to the study of delirium in the LTC setting (Anderson et al., 2012; Arinzon et al., 2011; Cole et al., 2011; Cole et al., 2012a; Cole et al., 2012b; de Lange et al., 2013; Marcantonio, Bergmann, Kiely, Orav, & Jones, 2010; McCusker et al., 2011a; McCusker et al., 2011b; McCusker et al., 2012; Voyer et al., 2008). Seven consistently recommended use of the CAM scale as the primary instrument to identify and recognize the diagnosis of delirium (Anderson et al., 2012; Arinzon et al., 2011; Cole et al., 2012a; Cole et al., 2012b; Marcantonio et al., 2010; McCusker et al., 2011a; McCusker et al., 2011b). In addition to use of the CAM scale, one study focused on the implementation of a delirium abatement program (DAP) in post-acute care SNFs. The DAP focused on four steps, which included assessing for delirium within five days of post-acute care admission, identification of the reversible causes of delirium, prevention of the complications associated with delirium, and finally, restoration of function. This study revealed that nurses who worked in SNF settings where the DAP was instituted detected delirium using the CAM scale in 41% of research participants, as compared to nurses in non-DAP sites who only detected delirium in 12% of cases. Overall, the implementation of the DAP markedly increased the detection of delirium (Marcantonio et al., 2010).

Another study, conducted in seven LTC facilities in Canada, used the CAM scale on a weekly basis for six months not only to identify the incidence of delirium, but also to identify the core symptoms. The focus of this study was to use the CAM scale to identify the core symptoms associated with episodes of delirium in elderly LTC facility residents. This study revealed that the core symptoms of delirium were present in 92.7% of participants before the episode of delirium occurred, and persisted for several weeks in 90.2% of participants (Cole et at., 2012a).

Anderson et al. (2012), focused on the complications that are associated with persistent delirium in the post-acute care setting. This study used the CAM scale as the primary instrument to identify delirium in eight Boston SNFs. Results of this study concluded that 7% of post-acute care patients often experience cardiac complications that are directly associated with the development of delirium. Another important aspect of this study is that in 56% of research participants, delirium persisted for up to one month after admission (Anderson et al., 2012).

One study that used the CAM scale for detection of delirium in LTC revealed that 34% of participants were accurately identified as having delirium (Arinzon et al., 2010). Another study conducted by Cole et al. (2012b), revealed through use of the CAM scale that not only is delirium frequently present in elderly LTC patients, but that episodes last longer in this setting than in acute care settings. Both of these studies support that the CAM scale is a reliable and valid tool for detecting delirium in the LTC setting, and recommend its increased use to improve the quality of care delivered. The potential benefits of the CAM scale include (a) facilitating early identification of patients who are at risk of developing delirium while hospitalized; (b) decreased incidence of hospital acquired delirium through early recognition; (c) decreased severity and length of delirium; (d) decreased likelihood of long term nursing home placement; (e) prevention of repeat episodes of delirium; (f) increased functional ability and independence; and (g) decreased morbidity and mortality associated with delirium (National Guideline Clearinghouse, 2009).

There are several organizations in the United States that are committed to improving the quality of care delivered to hospitalized patients, especially those in LTC who are at risk for developing delirium. One of the most important organizations that supports delirium

research is the Hospital Elder Life Program, which was founded by Dr. Sharon Inouye, an expert in the study of delirium, and the author of the CAM scale. All of the delirium guidelines presented above are published by the National Guideline Clearinghouse, which is a subsidiary of the AHRQ. The AHRQ works in conjunction with the United States Department of Health and Human Services to ensure that safe, high quality health care is delivered using the most recent scientific evidence (AHRQ, n.d.). Another key organization that supports the study of delirium is the National Institute for Health and Care Excellence (NICE). The NICE has developed clinical pathways, which include quality standards and guidelines, for an array of medical diagnosis including delirium (NICE, 2014). The fourth organization used for this review is the American Delirium Society, which exists to develop research, education, and quality improvement measures to minimize the impact that delirium can have on at risk patients (American Delirium Society, 2013).

Although the above entities are separate organizations, they all support the need for an improved process for screening for delirium, and promoting early recognition and diagnosis within the LTC setting. The guidelines and current recommendations that are presented by the National Guideline Clearinghouse, the Hospital Elder Life Program, the American Delirium Society, and NICE all specifically support the use of the Short CAM scale as an accurate tool that can be used within the LTC setting to adequately screen for, and recognize delirium. All of the above organizations are consistent in advocating for the need to increase routine screening, assessments, and observations of individuals who are at risk for the development of delirium while acutely hospitalized, or while receiving LTC.

The primary difference among the supporting organizations relates to the variability in reported statistics. Although the numbers they report in terms of the incidence of delirium,

and rate of complications for example are similar, there is some variation. This variability was noted also in the studies presented in the review. After reviewing the overall variation in the statistics, the variability is related, in part, to differences in how researchers define and identify delirium, as well as methods for collecting and analyzing data. The prevalence reported for the development of delirium in the LTC setting is 1.4-71.5% (Anderson et al., 2012; Cole et al., 2011; de Lange et al., 2013; McCusker et al., 2011a; McCusker et al., 2011b; McCusker et al., 2012; Voyer et al., 2008).

Gaps in Literature

Although several guidelines exist that support the routine use of the CAM scale to identify delirium within the LTC setting, there is a paucity of research studies that focus on identifying and treating delirium in this setting. There is a wealth of knowledge that exists regarding the need for proper screening of delirium in order to promote early recognition and diagnosis in the LTC setting. However, the evidence-based practice recommendations that support the routine implementation of delirium screening tools are not being consistently used. This is evident according to an extensive literature review, delirium is primarily studied in the acute care setting with limited information available in the LTC setting (Cole et al., 2011; Cole et al., 2012a; de Lange et al., 2013; Kwapis, 2009; McCusker et al., 2011a; McCusker et al., 2011b; Voyer et al., 2008). A review of the literature focused on delirium in the LTC setting consistently reports that up to 70% of patients within this setting will develop delirium, and may suffer with the consequences for an extended period of time (Cole et al., 2012a; Inouye, 2006; McCusker et al., 2011a; Solberg & Jewett, 2014). However, there is limited information available as to what is being done to combat this preventable condition in such a vulnerable patient population.

The Short CAM scale has been validated in research studies as an effective method of identifying delirium within the clinical setting. When used appropriately, it can promote early recognition and diagnosis of delirium (Hospital Elder Life Program, 2016c). Delirium continues to occur at a high rate in all health care settings, particularly within the LTC setting despite a strong body of evidence supporting the need for early recognition and diagnosis (Anderson et al., 2012; Cole et at., 2012a; McCusker et al., 2011a; Voyer et al., 2008).

Another major gap that exists is that, although there is substantial evidence supporting the need for routine delirium screening, there continues to be decreased surveillance, recognition, diagnosis, and treatment within the LTC setting. A study conducted by McCusker et al. (2011a), which used the CAM scale to identify delirium, concluded that delirium continues to be a substantial problem within LTC, especially in patients who have underlying cognitive impairment. According to a study conducted by Voyer et al. (2008), nurse detection of delirium is highly neglected within the LTC setting. Their study revealed that although the prevalence of delirium was 71.5%, only 13% of cases were detected by nurses. This supports the fact that nurses in general do not recognize the symptoms of delirium.

Conclusion

In conclusion, an extensive review of the literature reveals that delirium continues to occur at high rates within the LTC setting. Based on the statistics presented above, highlighting the high incidence of delirium within LTC settings, there is a documented need for the implementation of a scientifically sound tool, such as the CAM scale for screening and identifying delirium in SNF settings. The CAM scale is consistently identified as the only existing instrument that is considered a diagnostic observational tool for identifying

delirium. The Short CAM scale has been validated in research studies as an instrument that will enhance recognition and diagnosis of delirium so that an accurate diagnosis can be established, and supportive care measures promptly initiated, thereby avoiding the associated complications, and potentially decreasing adverse events.

Chapter III: Implementation and Evaluation

Methodology

The DNP synthesis project on delirium was a quality improvement project focused on improving the early recognition of delirium through the implementation and consistent use of the Short CAM scale for screening. Prior to implementing this project, the identified SNF unit did not have a policy or procedure in place to screen for delirium. The proposed project focused on implementing the Short CAM scale within 24 hours for each new admission to the SNF. This time frame was chosen as all documents that pertain to the admission process, such as the history and physical, nursing admit assessment, and consents for treatment, must be completed within 24 hours.

Project Design and Procedure

A needs assessment was conducted in the fall of 2014, which revealed that there is no process or procedure currently in place on the identified SNF unit to aide in early recognition and diagnosis of delirium. During this assessment, key stakeholders directly involved in the project were identified. The organizational culture, mission, and readiness for change was also assessed. Additionally, an analysis was performed to determine the strengths, weaknesses, opportunities, and threats to the proposed project. Institutional review board (IRB) approval was obtained from the University of Louisiana at Lafayette, and from the Baton Rouge General Medical Center prior to initiation of the project (see Appendix A).

The primary investigator for the project was the author, Christine Hadeed. Prior to project initiation, the SNF did not have a procedure in place for screening for delirium, nor did it track the number of delirium diagnoses that occurred in this setting. Therefore, the author collected baseline data as a portion of the project. This data collection occurred over a

two week period just prior to project implementation from August 24 through September 6, 2015. Baseline data was collected and compared to data during the project to determine if indeed the Short CAM scale was effective in identifying an increase in the incidence of delirium on the SNF. Retrospective chart reviews were conducted for approximately two weeks prior to implementing the Short CAM scale to determine how many patients were being diagnosed with delirium upon admission to the SNF without routine screening (see Appendix B).

After admission to the SNF, all patients were informed of the purpose of the project along with the potential risks and benefits, at which time they were subsequently asked if they agreed to participate. Based upon recommendations from the Baton Rouge General Medical Center IRB, completion of the Short CAM scale implies consent. Therefore, a waiver of written informed consent was obtained on all patients who verbally agreed to participate (see Appendix C). The project took place over an 8 week period commencing on September 7, 2015, and ending on November 2, 2015. A total of 108 patients were screened using the Short CAM scale during project implementation.

There were two instruments used in screening for delirium, the Short CAM scale and the Mini-Cog. The Short CAM scale was developed by Dr. Sharon Inouye, an expert in the field of delirium. Permission to use the Short CAM scale in this project was granted via email by Asha Albuquerque, a research assistant with Dr. Inouye at the Institute for Aging Research on March 4, 2015 (see Appendix D). Prior to use of the Short CAM scale in this project, the author accepted the designated terms of agreement on March 6, 2015, to include the following statement of acknowledgement for use of the Short CAM scale: Confusion Assessment Method. © 1988, 2003, Hospital Elder Life Program. All rights reserved.

Adapted from: Inouye SK et al. Ann Intern Med. 1990; 113:941-8. Based upon the copyright statement included in the Short CAM scale, due to liability and copyright restrictions, the full CAM instrument and training manual cannot be reproduced in any publication format or posted on any publically accessible website. Additionally, the Short CAM scale cannot be reprinted for academic dissertations, theses, or any publication. However, permission was granted to provide access of the Short CAM scale, and it can be accessed at http://www.hospitalelderlifeprogram.org/delirium-instruments/.

The second instrument that was used during this project was the Mini-Cog. Based upon recommendations by Dr. Inouye, immediately prior to screening patients for delirium with the Short CAM scale, all patients should undergo formal cognitive testing using the Mini-Cog. Permission to use the Mini-Cog for this project was obtained from Dr. Soo Borson, the author, and copyright holder for the Mini-Cog via email on March 1, 2015. On February 15, 2016, permission to reproduce the Mini-Cog for this project was granted via email by Dr. Borson (see Appendix E).

Per project protocol, the Short CAM scale screenings were performed by the unit's charge nurses, who are all registered nurses, and by the author. Prior to project implementation, the author provided extensive education and formal training regarding proper administration, and complete scoring of the Short CAM scale, and Mini-Cog to all of the charge nurses who were responsible for screening patients. Additionally, all charge nurses were trained on how to interpret and report positive results. In order to facilitate project accuracy, a detailed instruction guide was developed to assist charge nurses in the implementation process (see Appendix F). After verbal consent was obtained, the Short

CAM scale was performed on all new admissions to the SNF. The expectation was to perform screenings within 24 hours of admission.

Patients who met the criteria for delirium, per the Short CAM scale, were considered to have a positive screening. As part of the protocol, the SNF unit's charge nurse reported and documented positive screening results to the SNF physician or nurse practitioner to determine the need for further evaluation. All positive Short CAM scales were recorded on a daily record sheet. This record sheet was then hand delivered to the appropriate physician or nurse practitioner at 0800 daily for evaluation (see Appendix G). The physician or nurse practitioner was then responsible for confirming the diagnosis, initiating appropriate medical tests to assist in determining the etiology of delirium, and ordering supportive treatment measures.

Concurrent chart reviews were performed by the author at least three times weekly for eight weeks to: (a) determine how many patients on the SNF were being identified as exhibiting symptoms of delirium as indicated by a positive Short CAM scale result; (b) to monitor and evaluate if healthcare providers were being notified of positive Short CAM scale results; and (c) to evaluate how many patients were being subsequently diagnosed with delirium by healthcare providers. In order to determine if the Short CAM scale was being completed within 24 hours of admission, the unit census was monitored daily, and then compared to the total number of completed Short CAM scales.

In order to accurately track and analyze results, each completed Short CAM scale and Mini-Cog was identified with the patient's hospital label, and placed in the front of the patient's physical chart located in the nurse's station. As previously mentioned, patients who screened positive for delirium based upon Short CAM criteria were reported to the physician

or nurse practitioner for further evaluation. Therefore, the charge nurse was required to indicate on each positive Short CAM scale that the provider was notified of results, and the need for further evaluation. This allowed the author to determine how many scales were positive, and how many were reported to the provider, as requested.

Project Setting

The identified hospital, which has 590 licensed beds, is a metropolitan, not for profit, community owned hospital in a southern state that has two locations to serve the area (Baton Rouge General, 2016). The project was implemented at the mid-city location as this facility houses the SNF unit. Currently, there are two SNF units located on the mid-city campus. Both units are jointly managed, and staffed by the same charge nurses. The unit is divided into two separate units because one unit specializes in admitting patients of higher acuity and greater functional decline who often require maximum assistance, and an extensive physical and occupational therapy regimen. These patients are often acutely ill, and as such require specialized 24 hour care. The other unit admits patients that are more functional, and require less assistance. The project was conducted on both of the SNF units.

Project Participants

The identified patient population for the project consisted of all adults over the age of 18 who were hospitalized on the SNF. Race, gender, ethnicity, religion, socioeconomic status, educational background, and geographic location did not limit participation in the project. Patients that were excluded from the project included: (a) pregnant women; (b) women of childbearing age who were less than 50 years of age; and (c) non-English speaking individuals.

Data Collection

Data collection occurred concurrently with the project, and took place on the SNF unit. The author collected and analyzed data, at least three times a week, for eight weeks, in the fall of 2015 to: (a) determine how many patients on the SNF were being identified as exhibiting symptoms of delirium as indicated by a positive Short CAM scale result; (b) to monitor and evaluate if healthcare providers were being notified of positive Short CAM scale results; and (c) to evaluate how many patients were being subsequently diagnosed with delirium by healthcare providers. In order to determine if the Short CAM scale was being accurately completed within the recommended 24 hours of admission, the unit census was monitored daily, and then compared to the total number of completed Short CAM scales. The descriptive statistics collected during project implementation included each participant's age in years, and their gender.

Accurate completion of the Short CAM scale by the administrator is essential to facilitating a diagnosis of delirium as scales that are completed incorrectly can yield false information. The author evaluated this outcome by personally reviewing all scales on a weekly basis for accuracy and completeness. Real time data was collected, and organized during project implementation using a chart abstraction tool, and a checklist developed in Microsoft Excel by the author (see Appendix H).

In order to protect patient confidentiality, each project participant was assigned an identification number upon review of their Short CAM scale by the author. This number served as the patient identifier, and was used to track statistical results from the data collected during the project. Individual patient identifiers such as name, address, and date of birth were not recorded during project implementation, and will not be shared within the project results.

Collected data was recorded and directly correlated to the participant's identification number. This data was stored on a secure and encrypted thumb drive, and within the author's password protected computer. When not in use, the thumb drive was kept in a locked drawer in a secured office. The only individuals that had access to the project data were those directly involved with the patient's care, and in the project. These individuals included the primary investigator, project mentor and committee chairs, SNF nurses, unit clerks, unit manager and educator, and the unit's physicians, and nurse practitioners. Once the collected data is analyzed, and the project is complete, all paper documents will be disposed of in a paper shredder, and computerized documents will be deleted in order to maintain confidentiality and protect patient privacy.

Instruments/Tools

The CAM scale is consistently identified as the most effective diagnostic screening tool used worldwide to promote early recognition of delirium. The CAM scale was first developed in 1988 by Dr. Sharon Inouye, an expert in the field of delirium. Since its inception the original Long CAM scale has been translated into 14 languages, and has undergone several modifications to make it more applicable in a variety of settings (Hospital Elder Life Program, 2016c). Nonetheless, the CAM scale has become the gold standard for identification of delirium (Hospital Elder Life Program, 2016a).

The CAM scale was developed as a standardized tool to assist non-psychiatrically trained healthcare professionals in accurately identifying delirium in all settings. It is the most widely used tool to identify delirium. The CAM scale has been validated in multiple research studies as having a sensitivity of 94-100%, and a specificity of 90-95% for accurately detecting delirium in all settings (Inouye et al., 1990). According to Inouye et al.

(1990), the reliability of the CAM scale was high, reported at a kappa of 0.81-1.0. The Short CAM scale has proven to be successful in identifying delirium on a national and international level (Hospital Elder Life Program, 2016c; Vanderbilt University Medical Center, 2013). Common symptoms and observed behaviors of delirium that are specifically evaluated in the CAM scale include (a) attention deficits; (b) disorganized or incoherent thinking; (c) illogical flow of ideas; (d) disturbances in sleep-wake cycles; (e) motor changes; (f) altering levels of consciousness; (g) frequent disorientation to person, place, and time; (h) worsening nocturnal confusion; (i) short term memory impairment; (j) emotional lability; and (k) changes in speech and language patterns (Beary, 2013; Fong et al., 2009; Inouye, 2014; Sarutzki-Tucker & Ferry, 2014).

The Short CAM scale was chosen for this project as it is consistently supported in the literature as the best tool that can be used to screen for, and assist in the identification of delirium. This scale is a structured quantitative data collection instrument in the form of a questionnaire that yields five yes/no answers. The Short CAM scale, administered by nursing staff using a structured interview with the patient, took approximately two minutes to complete. The four domains assessed with the Short CAM scale include (a) behavior; (b) inattention; (c) disorganized thinking; and (d) level of consciousness (Hospital Elder Life Program, 2016c).

The first domain assessed with the Short CAM focuses on behavior changes, and yields a total of two yes/no answers (Hospital Elder Life Program, 2016c). The second domain assessed with the Short CAM scale is inattention. The presence or absence of inattention must be determined using a formal cognitive screening tool just prior to implementation of the Short CAM scale (Hospital Elder Life Program, 2016c). This project used the Mini-Cog

to definitively determine the presence or absence of inattention. The Short CAM scale only has one yes/no question related to inattention that determines if the patient is having difficulty focusing (Hospital Elder Life Program, 2016c). The third domain that the Short CAM scale assessed is disorganized thinking, which yields one yes/no question. The fourth and final domain assessed with the Short CAM scale is altered level of consciousness, which yields one yes/no answer (Hospital Elder Life Program, 2016c).

The Short CAM scale is scored based upon the information gathered in all four of the above domains. In the event that inattention is identified along with behavior fluctuations, and either disorganized thinking, or altered level of consciousness, then delirium is suggested and the scale is considered positive. Of note, the Short CAM scale is only designed to identify cases of delirium. It cannot determine the severity of the delirium (Hospital Elder Life Program, 2016c). A detailed description of the Short CAM scale can be found at http://www.hospitalelderlifeprogram.org/delirium-instruments/.

Based upon recommendations from Dr. Sharon Inouye, the author of the Short CAM scale, all patients must undergo formal cognitive testing just prior to the implementation of the Short CAM scale. Formal cognitive testing ensures that the administrators of the Short CAM scale are accurately addressing the domain of inattention, rather than making an individualized, and subjective observation (Hospital Elder Life Program, 2016c; Inouye et al., 1990). The formal cognitive test used with this project was the Mini-Cog, which is a quantitative data collection instrument that can determine the patient's baseline cognitive function. The Mini-Cog was conducted immediately prior to implementation of the Short CAM scale. The Mini-Cog has a sensitivity of 99%, and a specificity of 89-93% for differentiating individuals with dementia from those without (Borson, Scanlan, Brush,

Vitaliano, & Dokmok, 2000; Doerflinger, 2010). Cognitive domains assessed with the Mini-Cog include (a) memory; (b) executive function; (c) attention; (d) speed of processing; and (e) visual context/spacial (U.S. Department of Health and Human Services National Institute on Aging, n.d.).

There are two discrete categories that are evaluated with the Mini-Cog. These include memory recall, and the ability to draw a clock (Borson et al., 2000). The Mini-Cog yields a numerical score of 0-5. Individuals receive one point for each memory item recalled correctly, for a maximum of three points, and up to two points for an accurate clock drawing (Borson et al., 2000). Clocks that are absent of required elements receive a zero. In the event that a patient refuses to draw the clock then they also receive a zero (Borson et al., 2000). This instrument was also administered by nursing staff using a structured interview with the patient. Although the Mini-Cog is typically used to assess the cognitive function of elderly adults, its use is recommended concurrently with the Short CAM scale to accurately and objectively identify inattention (see Appendix I; Hospital Elder Life Program, 2016c).

Protection of Human Subjects

Institutional review board approval was obtained from the University of Louisiana at Lafayette, and the Baton Rouge General Medical Center prior to project implementation. Upon admission to the SNF, patients were informed of the purpose of the project along with the potential risks and benefits after which they were asked if they agreed to participate. A waiver of signed informed consent was obtained on all patients who agreed to participate in the project. Collected data remained within the facility with the exception of the de-identified data on the author's encrypted thumb drive. The de-identified data that was collected throughout the project included the participants (a) gender; (b) age; (c) date of admission; (d)

Mini-Cog score; (e) assurance of the legally authorized representative for cognitively impaired participants, which yielded a yes or no answer; (f) completion of the Short CAM scale within 24 hours, which yielded a yes or no answer; (g) Short CAM score, recorded as either negative or positive; (h) notification of the healthcare provider for positive scores, which yielded a yes, no, or not applicable; and (i) for positive Short CAM scales, was the participant diagnosed with delirium by the healthcare provider, which yielded a yes no answer along with the patients official medical diagnosis.

The only individuals who had access to the information collected on the Short CAM scale and the Mini-Cog were those directly involved with the patient's care, and in the project. These individuals included the primary investigator, project mentor and committee chairs, SNF nurses, unit clerks, unit manager and educator, and the unit's physicians and nurse practitioners. Based upon recommendations from the Baton Rouge General IRB, after the collection of data, all completed Short CAM scales, and Mini-Cog scales were routinely removed from the patient's physical chart and destroyed primarily by the author. As a secondary assurance, the SNF unit clerk removed all remaining scales in the patient's physical chart prior to discharge. As a tertiary assurance that the Short CAM scale and Mini-Cog did not remain part of the patient's permanent medical record, the printed scales were not encrypted with the standardized bar code that is required for scanning documents into the permanent electronic medical record within the Baton Rouge General. Therefore, any scales that may have been overlooked and not physically removed from the patient's medical record prior to discharge were destroyed in the medical records department of the Baton Rouge General.

The identified risks involved with this project were minimal. Risks related to the screening process included emotional discomfort for the patient and their family, or fatigue, and feelings of uncertainty that may have surfaced during questioning. Although collected data was kept in a secure location, patients may have feared a loss of confidentiality after agreeing to participate in the project. Patient benefits related to participation in the project included the potential for early recognition and treatment of delirium that may have otherwise gone undetected, and as such untreated. Patients may have also experienced an altruistic feeling related to their participation in improving the delivery of care at the SNF.

Chapter IV: Findings and Analysis

Demographic Characteristics of Project Participants

A total of 116 eligible patients were admitted to the SNF during the implementation phase of this quality improvement project. Of these, 93% (n= 108) agreed to participate and were screened (see Table 1).

Table 1

Demographic Characteristics of Project Participants (n= 108)

Gender	n=108	% of males versus females
Female	67	62
Male	41	37.9

The age range of the participants screened was 51-95 with a mean age of 74.72, median of 75, and standard deviation of 11.03. A total of 8 participants refused, of which 7 were female. The race, ethnicity, and marital status of participants was not collected during the project implementation phase as this demographic information does not relate to the development of delirium, and did not affect participation in the project.

Results

Outcome measures for this project were quantitative and included: (a) the number of patients on the SNF who were identified as exhibiting symptoms of delirium as indicated by a positive Short CAM scale result; (b) monitoring and evaluating if healthcare providers were notified of positive Short CAM scale results; (c) evaluation of patients diagnosed with delirium by healthcare providers; and (d) the number of Short CAM scales completed within 24 hours of admission.

Prior to project initiation, the SNF did not have a procedure in place for delirium screening nor did it track the number of delirium diagnoses that occurred in this setting. Therefore, the author collected baseline data as a portion of the project. This data collection occurred over a two week period just prior to project implementation from August 24, 2015 through September 6, 2015 in which the author performed retrospective chart audits to determine how many patients were being diagnosed with delirium upon admission to the SNF without routine screening. A total of 60 patients (n= 60) were screened during this process (see Table 2).

Table 2

Demographic Characteristics of Baseline Sample (n= 60)

Gender	n=60	% of males versus females
Female	40	67
Male	20	33

The age range of the baseline data sample was 28-96 with a mean age of 74.32, median of 74, and standard deviation of 15.24. Only 3 patients (0.05%) were officially diagnosed with delirium during the baseline data collection period.

The DNP synthesis project took place over an 8 week period commencing on September 7, 2015, and ending on November 2, 2015. A total of 116 eligible patients were admitted to the SNF during the implementation phase of this quality improvement project, of which a total of 108 participants were screened using the Short CAM scale during project implementation. Seventeen of the 108 participants (16%) who were screened had a positive Short CAM scale indicating that they were exhibiting signs and symptoms consistent with delirium. The remaining 91 (84%) had negative Short CAM scales (see Appendix J).

Of the positive Short CAM scales 9 participants (53%) were female, whereas 8 (47%) were male. The age range of the participants who had positive Short CAM scales were 65-93 with a mean age of 79 years (see Table 3).

Table 3

Demographic Characteristics of Positive Short CAM Scale Results (n= 17)

Gender	n=17	%
Female	9	53
Male	8	47

Findings from this project show that the baseline data is similar to the actual project data in regards to gender and the age range of participants. The age range of the baseline data sample was 28-96 with a mean age of 74.32, median of 74, and standard deviation of 15.24. The age range of the participants screened during the project implementation period was 51-95 with a mean age of 74.72, median of 75, and standard deviation of 11.03. Furthermore, although only 3 patients (0.05%) were officially diagnosed with delirium during the baseline data collection period, this information was collected over a two week period, as compared with the 108 participants who were screened during the eight week project implementation period. During the project implementation period, a total of 108 participants were screened using the Short CAM scale of which 17 participants had a positive Short CAM scale indicating that they were exhibiting signs and symptoms consistent with delirium. Finally, although more women participated in this project there is no gender bias for those diagnosed with delirium. Of the positive Short CAM scales 9 participants (53%) were female, whereas 8 (47%) were male.

Throughout the project, the protocol called for the SNF unit's charge nurse to report and document positive Short CAM scale results to the SNF physician or nurse practitioner to determine the need for further medical evaluation. This outcome yielded 100% compliance with all 17 of the positive Short CAM scales being reported to the patient's healthcare provider within 24 hours of scale completion. Of the 17 positive Short CAM scales, 15 (88%) of these patients were ultimately diagnosed with delirium by healthcare providers, whereas only 2 (12%) were not (see Appendix K). Although the healthcare provider was notified of all 17 positive Short CAM scale results, further actions and acknowledgement of delirium was not documented within the medical record for two of the 17 patients who had a positive screening.

The project protocol specified that the Short CAM scale be completed accurately by the charge nurse on all consenting participants within 24 hours of admission to the SNF. In order to accurately complete the Short CAM scale, all four items of the Short CAM had to have a documented response. Additionally, in order to accurately determine the domain of inattention, each participant underwent cognitive screening using the Mini-Cog just prior to implementation of the Short CAM scale. Similarly, all items on the Mini-Cog required a documented response to be considered accurately completed. In total, 86 of the 108 scales (80%) were performed accurately and within the recommended 24 hours. The remaining 22 (20%) were performed accurately, but beyond the recommended 24 hours (see Appendix L). The time frame for the Short CAM scales completed beyond the recommended 24 hours ranged from 36 hours after admission up to 120 hours. A total of 19 Short CAM scales were completed after the patient had been admitted for more than 24 hours, but within the first 48 hours.

Based upon recommendations by Dr. Inouye, the author and developer of the Short CAM scale, immediately prior to screening patients for delirium with the Short CAM scale, all patients should undergo formal cognitive testing using the Mini-Cog to definitively determine the presence or absence of inattention. In total, 107 participants were screened using the Mini-Cog prior to completion of the Short CAM scale. Only one participant refused the Mini-Cog screen. Additionally, in the event a participant was deemed to have cognitive impairment, based upon results of the Mini-Cog, it was recommended by the IRB that their legally authorized representative be contacted to obtain consent to participate in the project. In total, 38 of the 108 participants (35%) received a Mini-Cog score of less than three and thus were deemed cognitively impaired. The legally authorized representatives for all 38 cognitively impaired participants were contacted prior to participation in the project and gave formal consent. Sixteen of the 17 participants who had a positive Short CAM scale received a score less than three on the Mini-Cog. One participant who had a positive Short CAM scale refused to complete the Mini-Cog examination. The remaining 21 participants who scored less than a three on the Mini-Cog had negative Short CAM scales (see Table 4).

Table 4

Comparison of Mini-Cog Scores (n=108)

Mini-Cog Scales	n	%
Positive	38	35
Negative	69	65
Refused	1	.009

Findings from this project suggest that routine screening using the Short CAM scale assists in the early identification of delirium. Although the Short CAM scale cannot be used

to quantify delirium, results from this project show that it does assist in identifying patients who are exhibiting signs and symptoms of delirium. Prior to project implementation, 60 retrospective chart reviews were performed to ascertain the number of patients who were diagnosed with delirium on the SNF unit without routine screening. A total of 60 patients (n= 60) were screened during this process, of which only three patients (0.05%) were officially diagnosed with delirium. Results from this project show that 17 of the 108 participants (16%) had a positive Short CAM scale (see Appendix M).

Participants who had a positive Short CAM scale were evaluated by their healthcare provider to establish an official diagnosis, determine the need for additional testing, and facilitate treatment options. Of the 17 positive Short CAM scales, 15 (88%) of these participants were ultimately diagnosed with delirium by healthcare providers, whereas only 2 (12%) were not. The 2 participants who had a positive Short CAM scale but were not diagnosed with delirium did not have documentation within their medical record to indicate why the healthcare provider did not agree with results of the Short CAM scale. Although the provider was notified of the positive Short CAM scale result, further actions and acknowledgement of delirium was not addressed within the medical record.

A Chi-square test was performed to determine the relationship between the use of the Short CAM scale and the number of positive delirium screenings. The data used included the baseline data that was collected prior to the implementation of the routine screening protocol, and the actual project data that was collected during the project implementation phase in which participants were screened for delirium using the Short CAM scale upon admission to the SNF. Baseline data revealed that three patients were diagnosed with delirium without routine screening (n=3). The total number of participants who had a positive Short CAM

scale screening during the project implementation phase was 17 (n=17). The two variables analyzed with the Chi-square test were (a) the use of the Short CAM scale; and (b) the number of positive delirium screenings.

Two hypotheses were developed to determine the association between the two categorical variables for this project. The null hypothesis is that there is no relation between the Short CAM scale and the number of positives. The alternate hypothesis is that there is an association between the Short CAM scale and the number of positives. The calculated Chi-square result, at a 95% confidence interval, was 0.0394. Given that this values is greater than the 95% confidence interval at one degree of freedom (0.0039), the null hypothesis is rejected (Kim & Mallory, 2014). Therefore, the alternate hypothesis is accepted; there is an association between the Short CAM scale and the number of positives. The significance of the Chi-square test is that it indicates a relationship between use of the Short CAM scale and the number of positive screenings.

Evaluation of Project Implementation

Promoting a system change is a dynamic process that requires commitment from everyone involved. Throughout this quality improvement project, the implementation process itself was continuously evaluated to determine the need for adjustments and modifications in the project protocol. This was accomplished by the primary investigator meeting face to face with the SNF charge nurses, who were directly involved in the project implementation, and the unit manager and educator on a weekly basis to ascertain real time feedback. During these meetings, any obstacles to implementation were discussed, ideas and suggestions to improve compliance with the project protocol were identified, and solutions were generated. In order to ascertain active participation from all charge nurses on the SNF, an incentive was

offered in which the charge nurse who performed the most screenings would receive a gift card at the conclusion of the project.

One of the primary barriers of this quality improvement project was underestimating the lack of participation and compliance from the unit charge nurses directly involved in project implementation. Although this was identified as a potential weakness during the planning phase, it was not sufficiently accounted for while developing the time line for project implementation or arranging scheduled training. As a result, 19 of the first 32 screenings (60%) were performed by the author due to the lack of SNF charge nurses completing the screening per protocol procedure. This prompted a discussion with the unit charge nurses in which it was determined that the nurses were simply forgetting about the new screening process. In order to address this issue, and as a reminder to screen patients, it was decided that the Mini-Cog and Short CAM scale would be placed in the admit packet for each new patient arriving to SNF. This admit packet contained all documents that required the attention of the charge nurse upon admission to the SNF. Placing the screening tools in this packet served as a reminder for all charge nurses to screen each new admission who agreed to participate, and ultimately helped facilitate compliance with the project protocol.

Although placing the screening tools in the admit packet helped improve compliance with screenings initially, it did not solve the problem altogether. As a result, a new order set was created in which official physician orders were entered into the electronic medical record of consenting participants. The physician order stated that all Short CAM scales must be completed by the unit charge nurse within 24 hours of admission. This process began on September 22, 2015 and continued through November 2, 2015. After initiation of the order set, 58 of the remaining 76 participants (76%) were screened by the SNF charge nurses,

whereas 18 (24%) were screened by the author. In total, at the end of the project 37 participants (34%) were screened by the author and 71 participants (66%) were screened by the unit charge nurses. Had this substantial issue been taken into account during planning efforts, recommendations could have been made to delay the start date to allow for additional training and entering of official orders. Also, the timeline for project implementation, and the number of total participants could have been extended.

Discussion

The results of this project show that the implementation of the Short CAM scale is a feasible way to identify delirium in patients who may have otherwise gone undetected and as result undiagnosed and untreated. Screening for delirium using the Short CAM scale is a relevant, and high benefit project with a low implementation cost as use of the Short CAM scale and Mini-Cog are free. On average, the Short CAM scale took the unit charge nurses 2 minutes to complete. Based upon the instructions provided with the Mini-Cog, this portion of screening did not take more than 4 minutes. Therefore, in total, this screening process took no longer than 6 minutes of the charge nurses time. The only monetary costs to the unit include printing of the scales, and 6 minutes of the charge nurse's hourly pay.

Although there is a paucity of research on delirium in the LTC setting, many of the characteristics of this project are reflective of current published research studies. On average, 55.8%-73.7% of individuals who participated in previous studies on delirium within LTC were women (Anderson et al., 2012; Cole et al., 2011; Cole et al., 2012a; Marcantonio et al., 2010; McCusker et al., 2011a; McCusker et al., 2011b; McCusker et al., 2012; Voyer et al., 2008). This project, similarly, included more female than male participants with 62% of

participants in this project being female. This percentage fell within the range of the published literature.

The mean age of participants for this project was 74.72 with a standard deviation of 11.3. Although this project had a mean age slightly younger than other studies in the literature, the age range of participants was similar. Within the current literature, the mean age of individuals who participated in delirium studies within the LTC setting is noted to be 83.6 -87.4, with standard deviations of 6.3-7.4 (Anderson et al., 2012; Cole et al., 2012a; McCusker et al., 2012; Marcantonio et al., 2010).

There is also a correlation within the current literature and this project in that cognitive impairment is noted in individuals experiencing delirium within LTC settings. For this project, 16 of the 17 participants (94%) who had a positive Short CAM scale received a score less than three on the Mini-Cog indicating cognitive impairment. One participant who had a positive Short CAM scale refused to complete the Mini-Cog examination. A prospective study that was conducted in 2011 within the LTC setting revealed that 149 of the 235 participants (63%) demonstrated mild to severe cognitive impairment (McCusker et al., 2011b). According to McCusker et al. (2012a), the development of delirium is a pertinent complication within LTC settings, especially for patients who may already have moderate to severe cognitive impairment.

Based upon the findings from this project, and the current literature, within the LTC setting delirium primarily occurs in individuals older than 65 years of age. For this project, the 17 participants (16%) who had a positive Short CAM scale were between the ages of 65-93, with a mean age of 77.8. According to a review of the literature, within LTC facilities the rates of delirium range from 3.4%- 65% in those 65 years of age and older (Cole et al., 2011;

McCusker et al., 2011a; McCusker et al., 2011b; McCusker et al., 2012. The percentage of patients identified as having a positive Short CAM scale for this project (16%) falls within the above range, albeit the lower portion of the range. This lower rate of delirium cases may be in part related to the overall younger mean age of project participants.

The long term sustainability of this project is directly dependent upon the amount of support received from the organization's quality improvement (QI) department, and continued participation from the SNF unit director, manager, educator, and staff members. The most effective manner in which to sustain this project would be to receive approval from the QI department for the creation of a new hospital policy in which all patients who are admitted to the SNF will be screened using this project's protocol. The creation of a unit policy, and continued use of the delirium order that was developed for this project, could facilitate compliance with the screening procedure Overall, this project was easy to implement, taking approximately six minutes of the charge nurses time. From a monetary standpoint, the only costs that would be incurred by the organization is the cost to print the scales, and the time it takes for the charge nurses to complete the scales.

Chapter V: Conclusions and Recommendations

Limitations

The primary limitation of this quality improvement project was a limited time frame for implementation. Although the project took place over an 8 week period and included 108 participants, a longer implementation phase could have allowed for additional screening time. Extending the time period for screenings beyond 8 weeks may have captured an increased number of positive Short CAM scales. Additionally, the baseline data collection period occurred over a two week period just prior to project implementation and resulted in 60 chart reviews being performed. Had this baseline screening period been extended beyond two weeks, the baseline sample size could have been increased and the actual results correlated more closely to the project sample size.

Implications for Further Research

Nursing Practice.

Many of the patients who are admitted to LTC settings such as SNFs are often acutely ill, elderly, and have multiple co-morbidities. This predisposes these patients to an increased risk of developing delirium. Although many LTC personnel are familiar with the term delirium, they are not aware of the implications and consequences that can result should delirium develop (Centers for Medicaid and Medicare Services [CMS], n.d.). In order to improve the quality of care provided to patients in LTC settings, it is imperative that nurses in this setting have a working knowledge of delirium. Therefore, bedside nurses who provide care for elderly individuals within the LTC setting would benefit from proper education on delirium. This includes (a) being aware of the signs and symptoms of delirium and knowing how to recognize delirium; (b) understanding the causes of delirium; (c) knowing how to

prevent delirium from occurring; and (d) being aware of treatment options (CMS, n.d.). One way to increase delirium education in this setting is to provide quarterly in-services, and to incorporate delirium education into the new hire orientation program. Nurses in the LTC setting are essential in treating delirium, hence strengthening the need for a sound knowledge base on delirium (Hospital Elder Life Program, 2016b).

Nursing Administration.

Although delirium is a common occurrence within the LTC setting there is a paucity of research studies that focus on identifying and treating delirium in this setting. Current evidence suggests that routine screening for delirium using the Short CAM scale is an effective way identify this life altering process. The results of this project enhance the limited research that is currently available on delirium and LTC settings. This quality improvement project provided evidence that routine screening for delirium should occur within LTC settings such as SNFs as screening can improve the detection of delirium. Improving the detection rate is paramount to improving the quality of care delivered and ultimately improving patient outcomes. Furthermore, the implementation of routine screening processes has the potential to reduce the overall costs to the organization providing care, and to patients.

Standardizing screening protocols, such as the one used for this project, is an easy and feasible way to increase the detection rates of delirium within the LTC setting. One way to accomplish this is to create a unit policy that requires routine screening for delirium in the SNF setting, and to continue to use the delirium order developed for this project. Additionally, placing the Short CAM scale and Mini-Cog in the SNF admission packets can facilitate the screening process. The results of this project indicate that at a minimum,

individuals who are hospitalized within LTC settings and are over the age of 65 should undergo routine screening for delirium as they are at an increased risk of developing this life altering process.

Nursing Education.

Given the high occurrence rate of delirium in all settings, the importance of educating our young nurses on delirium cannot be underestimated. In order to promote adequate knowledge of delirium it is imperative that schools of nursing ensure that the study of delirium is integrated into the undergraduate curriculum design. One method in which this can be accomplished is to incorporate the information provided by the John A. Hartford foundation, and the Portal of Geriatrics Online Education into baccalaureate nursing education programs. The John A. Hartford Foundation specializes in improving the care of elder adults (John A. Hartford Foundation, 2016). The Portal of Geriatrics Online Education (2014), is a free service that provides educational material that can be used to promote geriatric education.

Significance to Nursing and Healthcare

Currently, there is a documented need to translate the research that is available on delirium within long term care settings into daily practice. Based on the continued high occurrence rate of delirium within SNFs, there is also a need to implement routine screening procedures, such as the Short CAM scale, that can aide in early recognition and diagnosis of delirium. This project was able to identify 17 participants who were demonstrating signs and symptoms of delirium. Had routine screening not been implemented, these participants may have otherwise gone undetected and therefore untreated. Fifteen of the 17 patients who had positive Short CAM scales were ultimately diagnosed with delirium by their healthcare

provider, and appropriate evaluation and treatment was initiated. This project assisted in improving patient outcomes, safety, and the quality of care being delivered to all patients at the SNF.

The results of this project can help strengthen the need for routine screening policies within LTC settings, and adds valuable information to an area within medicine that is often overlooked. This project contributed a substantial amount of knowledge to the nursing profession, and improved current practices through the implementation of a scientifically proven, evidenced-based practice recommendation. Furthermore, this project provided nursing staff within the SNF routine access to, and an opportunity to use an internationally recognized, standardized screening tool that identifies delirium.

Plans for Dissemination of Results

During the fall of 2015 this project was presented, in the form of a poster presentation, at the Louisiana Association of Nurse Practitioners annual Primary Care Conference in Shreveport, Louisiana. The project was presented to the QI department at the Baton Rouge General Medical Center on March 22, 2016. On April 25, 2016, project findings will be presented to the faculty and to fellow peers at the University of Louisiana at Lafayette. The project will also be presented to the management, staff, and colleagues at the SNF, and throughout the hospital as requested. The author is submitting an abstract for a poster presentation at the annual Louisiana Association of Nurse Practitioners Conference in the fall of 2016. Additionally, a submission for presentation at the annual American Delirium Conference in 2016 is being considered. Presentation at this conference would likely occur in the summer of 2016. As requested, the author will prepare a report of the project to be shared with Dr. Inouye, and Dr. Borson, respective authors of the Short CAM scale, and the Mini-

Cog. The author would like contribute to the study of delirium within the LTC setting through the submission of a manuscript in appropriate professional journals.

In conclusion, this project contributes to the current evidence that is available on delirium within the LTC setting. Results of this project show that screening for delirium using the Short CAM scale is an easy and reliable method for detecting early cases of delirium that may have otherwise gone undetected and as such undiagnosed. Performing routine screening for delirium in the LTC setting has the potential to improve patient outcomes, the quality of care delivered in this setting, and healthcare costs.

References

Agency for Healthcare Research and Quality. (n.d.). *About AHRQ.* Retrieved from http://www.ahrq.gov/cpi/about/index.html

American Delirium Society. (2013). *Delirium simple facts.* Retrieved from https://www.americandeliriumsociety.org/about-delirium/healthcare-professionals

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.).* Washington, DC: American Psychiatric Association.

Anderson, C.P., Ngo, L.H., & Marcantonio, E.R. (2012). Complications in post-acute care are associated with persistent delirium. *Journal of the American Geriatrics Society, 60*(6), 1122-1127. doi:10.1111/j.1532-5415.2012.03958.x

Arizon, Z., Peisakh, A., Schrire, S., & Berner, Y.N. (2011). Delirium in the long-term care setting: Indicator to severe morbidity. *Archives of Gerontology and Geriatrics, 52,* 270-275. doi:10.1016/j.archger.2010.04.012

Australian Commission on Safety and Quality in Healthcare. (2015). *Delirium clinical care standard.* Retrieved from http://www.safetyandquality.gov.au/our-work/clinical-care-standards/delirium-clinical-care-standard/

Baton Rouge General. (2016). *About us.* Retrieved from http://www.brgeneral.org/about-us

Beary, T. (2013). Delirium prevention: Early recognition and treatment. *Nursing and Residential Care, 15*(8), 547-551.

Borson, S., Scanlan, J., Brush, M., Vitaliano, P., & Dokmok, A. (2000). The mini-cog: A cognitive vital signs measure for dementia screening in multi-lingual elderly. *International Journal of Geriatric Psychiatry, 15,* 1021-1027.

Brooks, P., Spillane, J.J., Dick, K., & Stuart-Shor, E. (2014). Developing a strategy to identify and treat older patients with postoperative delirium. *AORN Journal, 99*(2), 256-275. doi:10.1016/j.aorn.2013.12.009

Centers for Medicaid and Medicare Services. (n.d.). *Delirium basic fact sheet*. Retrieved from https://www.nhqualitycampaign.org/files/CMS_DeliriumBasics_FactSheet.pdf

Cole, M.G., McCusker, J., Voyer, P., Monette, J., Champoux, N., Ciampi, A.,…Vu, M. (2011). Subsyndromal delirium in older long-term care residents: Incidence, risk factors, and outcomes. *Journal of the American Geriatrics Society, 59,* 1829-1836. doi:10.1111/j.1532-5415.2011.03595.x

Cole, M.G., McCusker, J., Voyer, P., Monette, J., Champoux, N., Ciampi, A.,…Vu, M. (2012a). Symptoms of delirium occurring before and after episodes of delirium in older long-term care residents. *Journal of the American Geriatrics Society, 60*(12), 2302-2307. doi:10.1111/j.1532-5415.2012.04237x

Cole, M.G., McCusker, J., Voyer, P., Monette, J., Champoux, N., Ciampi, A.,…Vu, M. (2012b). The course of delirium in older long-term care residents. *International Journal of Geriatric Psychiatry, 27,* 1291-1297. doi:10.1002/gps.3782

de Lange, E., Verhaak, P.F.M., & van der meer, K. (2013). Prevalence, presentation and prognosis of delirium in older people in the population, at home and in long term care: A review. *International Journal of Geriatric Psychiatry, 28,* 127-134. doi:10.1002/gps.3814

Doerflinger, D.M. (2010). *Mental status assessment of older adults: The mini-cog*. Retrieved from http://consultgerirn.org/uploads/File/trythis/try_this_3.pdf

Dr. Hospitalist. (2008, August 1). Delirium dilemma. Retrieved from http://www.the-hospitalist.org/article/delirium-dilemma/

Fong, T.G., Tulebaev, S.R., & Inouye, S.K. (2009). Delirium in elderly adults: Diagnosis, prevention and treatment. *Nature Reviews Neurology, 5*, 210-220. doi: 10.1038/nrneurol.2009.24

Grover, S., Ghormode, D., Ghosh, A., Avasthi, A., Chakrabarti, S., Mattoo, S.K., & Malhotra, S. (2013). Risk factors for delirium and inpatient mortality with delirium. *Journal of Postgraduate Medicine, 59*(4), 263-270. doi:10.4103/0022-3859.123147

Henao-Castano, A.M., & Amaya-Rey, M.C.D.P. (2013). Nursing and patients with delirium: A literature review. *Investigacion and Educacion en Enfermeria, 32*(1), 148-156.

Hospital Elder Life Program. (2016a). *Delirium instruments overview*. Retrieved from http://www.hospitalelderlifeprogram.org/delirium-instruments/

Hospital Elder Life Program. (2016b). *For clinicians*. Retrieved from http://www.hospitalelderlifeprogram.org/for-clinicians/

Hospital Elder Life Program. (2016c). *The short confusion assessment method (Short CAM): Training manual and coding guide.* Retrieved from http://www.hospitalelderlifeprogram.org/uploads/disclaimers/Short_CAM_Training_Manual_10-9-14.pdf (2016b).

Hospital Elder Life Program. (2016d). *Why delirium is important*. Retrieved from http://www.hospitalelderlifeprogram.org/for-clinicians/why-delirium-is-important/

Inouye, S.K., van Dyck, C.H., Alessi, C.A., Balkin, S., Siegal, A.P., & Horwitz, R.J. (1990). Clarifying confusion: The confusion assessment method, a new method for detection of delirium. *Annals of Internal Medicine, 13*(12), 941-948.

Inouye, S.K., Foreman, M.D., Mion, L.C., Katz, K.H., & Cooney, L.M. (2001). Nurses' recognition of delirium and its symptoms. *ARCH Internal Medicine, 161,* 2467-2473.

Inouye, S.K. (2006). Delirium in older persons. *New England Journal of Medicine, 354*(11), 1157-1165.

Inouye, S.K. (2014). *The short confusion assessment method: Training manual and coding guide*. Retrieved from http://www.hospitalelderlifeprogram.org/delirium-instruments/short-cam/the-short-confusion-assessment-method-short-cam/

John A. Hartford Foundation. (2016). *What we believe.* Retrieved from http://www.jhartfound.org/about/overview/

Kim, M.J., & Mallory, C. (2014). *Statistics for evidence-based practice in nursing.* Burlington, MA: Jones & Bartlett Learning.

Kwapis, K. (2009). Need for delirium protocol in post-acute care facilities. *The American Journal for Nurse Practitioners, 13*(6), 9-18.

Leslie, D.L., & Inouye, S.K. (2011). The importance of delirium: Economic and societal costs. *American Geriatric Society, 59*(2), 241-243. doi:10.111/j.1532-5415.2011.03671.x

Marcantonio, E.R., Bergmann, M.A., Kiely, D.K., Orav, E.J., & Jones, R.N. (2010). Randomized trial of a delirium abatement program for postacute skilled nursing facilities. *The American Geriatrics Society, 58*(6), 1019-1026. doi:10.1111/j.1532-5415.2010.02871.x

McCusker, J., Cole, M.G., Voyer, P., Monette, J., Champoux, N., Ciampi, A., …Vu, M. (2011a). Prevalence and incidence of delirium in long-term care. *International Journal of Geriatric Psychiatry, 26,* 1152-1161. doi:10.1002/gps.2654

McCusker, J., Cole, M.G., Voyer, P., Monette, J., Champoux, N., Ciampi, A., …Vu, M. (2011b). Use of nurse-observed symptoms of delirium in long-term care: Effects on prevalence and outcomes of delirium. *International Psychogeriatrics, 23*(4), 602-608. doi:10.1017/S1041610210001900

McCusker, J., Cole, M.G., Voyer, P., Ciampi, A., Monette, J., Champoux, N., …Vu, M. (2012). Development of a delirium risk screening tool for long-term care facilities. *International Journal of Geriatric Psychiatry, 27,* 999-1007.

Minnesota Department of Health. (n.d.). *Quality improvement at MDH: Plan-do-study-act*. Retrieved from http://www.health.state.mn.us/divs/opi/qi/toolbox/pdsa.html

National Guideline Clearinghouse. (2008). *Delirium and acute problematic behavior in the long-term care setting.* Retrieved from http://www.guideline.gov/content.aspx?id=12379&search=delirium+and+long+term+care+and+acute+confusion+and+delirium+and+delirium+and+long+term+care

National Guideline Clearinghouse. (2009). *Acute confusion/delirium.* Retrieved from http://www.guideline.gov/popups/printView.aspx?id=14340

National Guideline Clearinghouse. (2010a). *Delirium: Diagnosis, prevention and management*. Retrieved from http://www.guideline.gov/content.aspx?id=24121&search=delirium+and+long+term+care+and+acute+confusion+and+delirium+and+delirium+and+long+term+care

National Guideline Clearinghouse. (2010b). *Screening for delirium, dementia and depression in older adults.* Retrieved from http://www.guideline.gov/content.aspx?id=32417&search=delirium

National Institute for Health and Care Excellence. (2014). *Delirium in adults*. Retrieved from http://www.nice.org.uk/guidance/qs63

Phillips, L.A. (2013). Delirium in geriatric patients: Identification and prevention. *MEDSURG Nursing, 22*(1), 9-12.

Rice, K.L., Bennett, M., Gomez, M., Theall, K. P., Knight, M., & Foreman, M.D. (2011). Nurses' recognition of delirium in the hospitalized older adult. *Clinical Nurse Specialist, 25*(6), 299-311. doi:10.1097/NUR.Ob013e3118234897b

Rice, K.L., & Castex, J. (2013). Strategies to improve delirium recognition in hospitalized older adults. *The Journal of Continuing Education in Nursing, 44*(2), 55-56. doi:10.3928/00220124-20130124-03

Rice, K.L., Bennett, M.J., Clesi, T., & Linville, L. (2014). Mixed-methods approach to understanding nurses' clinical reasoning in recognizing delirium in hospitalized older adults. *The Journal of Continuing Education in Nursing, 45*(3), 136-148. doi:10.3928/00220124-20140219-02

Sarutzki-Tucker, A., & Ferry, R. (2014). Beware of delirium. *The Journal for Nurse Practitioners, 10*(8), 575-581. doi:10.1016/j.nurpra.2014.07.003

Shadvar, K., Baastani, F., Mahmoodpoor, A., & Bilehjani, E. (2013). Evaluation of the prevalence and risk factors of delirium in cardiac surgery ICU. *Journal of Cardiovascular and Thoracic Research, 5*(4), 157-161. doi:10.5681/jcvtr.2013.034

Society for Post-Acute and Long Term Care Medicine. (n.d.). *Nursing home quality improvement initiative.* Retrieved http://www.amda.com/consumers/initiative.cfm

Solberg, L.M., & Jewett, R.S. (2014). *Delirium in long term care: An unrecognized danger.* Retrieved from http://floridageriatricssociety.org/index.html

Steis, M.R., & Fick, D.M. (2008). Are nurses recognizing delirium? *Journal of Gerontological Nursing, 34*(9), 40-48.

The Portal of Geriatrics Online Education. (2014). *What is POGOe?* Retrieved from https://www.pogoe.org/about

U.S. Department of Health and Human Services National Institute on Aging. (n.d.). *Instruments to detect cognitive impairment in older adults.* Retrieved from http://www.nia.nih.gov/research/cognitive-instrument/mini-cog

Vanderbilt University Medical Center. (2013). *Adult non-ICU care: Monitoring delirium*. Retrieved from http://www.icudelirium.org/non-icu.html

Varghese, N.C., Macaden, L., Premkumar, B., Mathews, P., & Kumar, S. (2014). Delirium in older people in hospital: An education programme. *British Journal of Nursing, 23*(13), 704-709.

Voyer, P., Richard, S., Doucet, L., Danjou, C., & Carmichael, P.H. (2008). Detection of delirium by nurses among long-term care residents with dementia. *BMC Nursing, 7*(4), 1-14. doi:10.1186/1472-6955-7-4

Appendix A

IRB Approvals

Proposal Number:SU15-21 NURS

The University of Louisiana at Lafayette Institutional Review Board

APPLICATION FOR REVIEW OF RESEARCH INVOLVING HUMAN SUBJECTS

	RESPONSIBLE FACULTY OR STAFF SUPERVISOR / INVESTIGATOR	NAME OF INVESTIGATOR(S)
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This Application is for a:

☐ **Thesis**

☐ **Dissertation**

☒ **Research Project**

TITLE OF PROPOSAL/PROJECT: Screening for Delirium in Long Term Care Settings

In making this application, I certify that I have read and understood the guidelines and procedures developed by The University of Louisiana at Lafayette for the protection of human subjects and that I will comply with both the letter and the spirit of the university's policies. I further acknowledge my responsibility to report any significant changes in the protocol involving human subjects and to obtain written approval from the Institutional Review Board for these changes prior to making these changes. I understand that IRB approval extends for one year, and if the project continues beyond the date of approval, then I will notify the IRB and request a renewal.

☒ By checking this box, I, Christine Zoerner Hadeed, am hereby signing my name. Date: May 7, 2015

I certify that as faculty advisor I have read and approve of the research described in this application and will provide guidance and support to the student as needed.

☒ By checking this box, I, Dr. Jeanne Cartier, am hereby signing my name. Date: 6.8.15

This proposal has been reviewed and approved by The University of Louisiana Lafayette Institutional Review Board for compliance with the Code of Federal Regulations 45 CFR 46, Protection of Human Subjects and as amended.

☒ By checking this box, I, David Yarbrough, am hereby signing my name. Date: July 30, 2015

The University of Louisiana at Lafayette

MEMORANDUM

[redacted] **Institutional Review Board**

IRB 00001474

FWA00000758

to: **Christine Hadeed and Dr. Jeanne Cartier**

from: **David Yarbrough, Ph.D., IRB Chair**

re: **Approval of Proposal: SU15-21 NURS: Screening for delirium in long term care settings**

date: **July 30, 2015**

Your application for IRB review of the study at the

level of: Exempt

has been approved by the U.L. Lafayette Institutional Review Board.

Congratulations, you may begin collecting data.

Yearly reviews of IRB Status are not done for Exempt proposals. If, however, there are any changes in your data collection procedures, treatments, or subject population, please inform the IRB Chair in writing since substantive changes in the project will need to be reviewed. (Form accompanies this approval)

If there is any type of injury to any participant of this research you must notify the IRB within 24 hours. Failure to inform the IRB of injury to participants is grounds for suspension of the research.

When your project is complete, please contact the IRB chair to document the completion of the study using the enclosed form.

We wish you well with your project. If you have any questions about revisions and the need for re-review, please call me at 482-1015, or e-mail me at yarbrough@louisiana.edu

from the desk of:
David Yarbrough, Ph.D.
Associate Professor, Child and Family Studies
University of Louisiana at Lafayette
P.O. Box 42891
Lafayette, LA 70504-2891
(337) 482- 1015 email: yarbrough@louisiana.edu

Baton Rouge General
A Community of Caring

IRB APPROVAL DOCUMENT

INSTITUTIONAL REVIEW BOARD
225-387-7112
FAX: 225-336-2914
3600 Florida Boulevard
Baton Rouge, LA 70806

Investigator: Christine Z. Hadeed, MSN, APRN, ACNP-BC, CCRN

IRB Approval Date: 5/19/2015
Study Approval Expires: 5/18/2016
IRB Number: 2015-RP002
Submission Type: Initial
Type of Review: Expedited

LOCATIONS TO BE USED IN THE RESEARCH: Baton Rouge General Medical Center

SPONSOR: None
PROTOCOL NUMBER: N/A
TITLE: Screening for Delirium in Long Term Care Settings

Approval Includes:

- IRB Application
- Research Proposal 5.8.15
- Research Cover Letter
- Waiver of Consent request
- Waiver of HIPAA request
- CITI training
- COI disclosure
- CAM survey
- Mini-Cog survey

Expedited Rationale: Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies. Note: Some research in this category may be exempt.

BRGMC FWA #00001821
BRGMC IRB # IRB00005439
IORG # IORG0004567

1. The IRB complies with the requirements found in Part 56 of the Code of Federal Regulations and Part 46 of Federal Regulations
2. Re-Review of this proposal is necessary if:
   - Any significant alterations or additions are made to the protocol/proposal. Please note that some changes may be approved by expedited review; others require full board review.
   - You wish to continue beyond the continuing review date assigned to the study.
3. Use only the most current consent form bearing the IRB "APPROVED" STAMP. It is required that all IRB approved consent forms be retained in your files. Patients are to initial each page of the IRB approved consent.
4. In addition to the study consent form, the Baton Rouge General may require execution of standard hospital and/or surgical consent forms for any invasive procedures.

Please contact HRPP Office at 225-387-7112 or irb@brgeneral.org, if you have any questions or concerns.

Michelle Brignac, CIP, HRPP Manager

5/19/2015
Date

Appendix B

Baseline Data Collection Tool

Patient Room #	**Gender: M/F**	**Age in Years**	**Was patient diagnosed with delirium by Healthcare Provider on SNF admission H & P Yes/No**	**Attending Group**	**DOA**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Appendix C

Waiver of Written Informed Consent

Attach Patient Label Here:

This is NOT part of the patient's permanent medical record. Please remove from chart upon discharge or transfer from SNF and destroy

The following is information to participate

In the Doctor of Nursing Practice Project Titled:

Screening for Delirium in Long Term Care settings

Upon reading this document, you are volunteering to participate in a research study that will be conducted by Christine Z. Hadeed, Doctor of Nursing Practice Student at the University of Louisiana at Lafayette. The purpose of this project is to implement routine screening for delirium, using the Short Confusion Assessment Method (CAM) scale within 24 hours of admission to the skilled nursing facility located within the Baton Rouge General Medical Center, and to evaluate the effectiveness in improving early recognition and diagnosis of delirium.

Your participation in this 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 or loss of benefits to which you are entitled.

Confidentiality will be strictly maintained by assigning participants a research number that will be used to record all information related to the study. No protected health information will be recorded, or published in the study.

The primary investigator is Christine Z. Hadeed, Acute Care Nurse Practitioner, who can be contacted at 225-978-6800, or by email at ceh4537@louisiana.edu.

The Institutional Review Board (IRB) within the Baton Rouge General will oversee project implementation. You can contact the IRB at 225-387-7112, or irb@brgeneral.org.

Please be aware that by completing this survey you are consenting to be in the research study.

Sincerely,

Christine Z. Hadeed

Christine Z. Hadeed, MSN, APRN, ACNP-BC, CCRN

Doctor of Nursing Practice Student

University of Louisiana at Lafayette

Name of RN Completing Scale: _____

Date/Time of Mini-Cog Completion: _____

- **If cognitively impaired, the patient's legally authorized representative (LAR) must be notified for data collection. Please initial here that the LAR was notified to obtain consent to participate: _____**

Date/Time of CAM scale Completion: _____

If CAM scale is positive please notify appropriate MD or NP. For positive CAM scales only, please document the patient's name and room number on the daily record sheet located at the charge nurse desk, and give this daily record to HMG at 0800 the following morning. I will notify providers outside of HMG of positive results. Once the patient's name is recorded, please date and initial here: _____

Appendix D

Permission to Use the Short CAM Scale

-----Original Message-----
From: Christine E Hadeed [mailto:ceh4537@louisiana.edu]
Sent: Sunday, March 01, 2015 10:10 PM
To: AgingBrainCenter
Subject: Requesting Copyright Clearance for CAM Scale

Hello Dr. Inouye,

My name is Christine Hadeed. I am an adult acute care nurse practitioner currently practicing with the Hospital Medicine Group at the Baton Rouge General Medical Center in Baton Rouge, Louisiana. I am currently pursuing my Doctor of Nursing Practice (DNP) degree through the University of Louisiana at Lafayette. The DNP is a terminal degree that focuses on developing a quality improvement project within my area of practice. The project that I am developing focuses on screening for delirium in the long term care setting. The setting where my project will be implemented is a skilled nursing facility (SNF), located within the Baton Rouge General Medical Center. Currently, I am proposing that all new admissions be screened for delirium using the Short CAM scale within 24 hours of admission to the SNF, and with any change in cognition or mental status throughout hospitalization as my institution currently does not have any procedures or policies in place to screen for delirium.

In the past year, I have performed extensive research on delirium, and would like to request copyright clearance on the CAM scale, and specifically the Short CAM scale for use in my project. I have read and understand the terms of use specified in the Short CAM training manual and coding guide, which I retrieved from the Hospital Elder Life Program website. Ultimately, I would like to publish my DNP project results in peer reviewed medical journals, and will be presenting my project among colleagues and professors at the University of Louisiana at Lafayette upon program completion. I will not be using the Short CAM scale for profit use, however, because I may publish results upon completion, I am requesting full copyright clearance as of now. I am currently still in the developing stages of my project with planned implementation in the fall of 2015, with completion and analysis of results in the spring of 2016. As requested in the training manual, I will include the CAM copyright acknowledgement upon replication of the CAM scale for use in my project. If you need any further information regarding my project and the intended use of the CAM scale, please do not hesitate to ask. I thank you for your time.

Sincerely,

Christine Hadeed, MSN, APRN, ACNP-BC, CCRN
Cell Phone: 225-978-6800
Email: ceh4537@louisiana.edu

Dear Christine,

You have Dr. Inouye's permission to use the CAM for non-profit academic purposes. You must respond to this email indicating your acceptance of the disclaimer below. All uses must acknowledge the CAM. In particular, all presentations, posters, and publications must have this copyright statement:
"Confusion Assessment Method. © 1988, 2003, Hospital Elder Life Program. All rights reserved. Adapted from: Inouye SK et al. Ann Intern Med. 1990; 113:941-8."

Due to liability and copyright restrictions, we cannot allow the full CAM instrument or training manual to be reproduced in any publication format or posted on any publically accessible website. You also cannot reprint the CAM for academic dissertations, theses, or any publication. We prohibit the use of the CAM in smartphone applications and training videos. However, we are happy to have you provide a link to your users to our website: http://www.hospitalelderlifeprogram.org/delirium-instruments/.

Should you choose to use the CAM in any research, publications, or for internal educational or clinical use in the future, we request that you inform our office and share with us your results or document(s) *prior to their release*.

If you would like to adapt the CAM into your EMR, we will need to see and approve the final appearance of the CAM (which should include the copyright acknowledgement) in the EMR, before we can grant permission. Please contact us in order to receive an EMR template. After you receive the template, you must send us screenshots of the CAM in the medical record for approval. Feel free to contact us at any point if you have questions or concerns.

The CAM (long and short versions) and their associated training manuals are available for download at our website, http://www.hospitalelderlifeprogram.org/delirium-instruments/. The CAM (including the CAM-S) should be used in accordance with training and procedures outlined in the Training Manual. Please note that brief cognitive testing is recommended for validly scoring the CAM. At a minimum, testing of orientation and sustained attention is recommended (e.g., digit span, days of the week backward, or months of the year backward).

Disclaimer:
The CAM is intended to assist with identifying the symptoms of confusion or delirium and is intended to be used as instructed. An accurate diagnosis for delirium, confusion, or other psychiatric disorders can only be made by a qualified healthcare provider or physician after a clinical evaluation. These materials are not intended to address the many situations that may arise in dealing with delirium, and persons must exercise their independent judgment about such clinical situations. The Hospital Elder Life Program, LLC., Dr. Sharon K. Inouye, MD or Hebrew SeniorLife shall have no liability for claims by, or damages of any kind whatsoever to, a user of this content or any other person for a decision or action taken in reliance on the information contained on this web site. Such damages include, without limitation, direct, indirect, special, incidental or consequential damages. You expressly agree that the Hospital Elder Life Program, LC., Sharon Inouye, MD and Hebrew SeniorLife are

not liable for any injury, physical or financial, related to the content or your reliance on the content. Your use of these materials constitutes your agreement to the provisions of this disclaimer.

Please initial below in agreement of the terms.
- I have read and agree to the terms of the CAM disclaimer: _____

If you should have any further questions, please don't hesitate to contact me.

Best,
Asha

Asha Albuquerque
Research Assistant
Aging Brain Center
Institute for Aging Research
Hebrew SeniorLife
1200 Centre Street
Boston, MA 02131
Phone: 617 971 5414

March 6, 2015 4:52 pm

Hello Asha,

Thank you for your quick response granting me permission to use the Short CAM scale in my DNP project on delirium. I tried to initial the email at the bottom where indicated, however it will not allow me to initial. Therefore, I will acknowledge here that I have read and agree to the terms of the CAM disclaimer, and I will share my project results with Dr. Sharon Inouye prior to any publication of my work on delirium. Please let me know if you need anything else from me regarding my project. I greatly appreciate your help, and being granted permission to use the CAM scale. I will be in touch as my project develops further.

Sincerely,

Christine Hadeed, MSN, APRN, ACNP-BC, CCRN
225-978-6800
University of Louisiana at Lafayette DNP Student

Appendix E

Permission to Use the Mini-Cog

On Mar 1, 2015, at 7:25 PM, Christine E Hadeed <ceh4537@louisiana.edu> wrote:

Hello Soo Borson,

My name is Christine Hadeed. I am an adult acute care nurse practitioner currently practicing prn with the Hospital Medicine Group at the Baton Rouge General Medical Center in Baton Rouge, Louisiana. I am currently pursuing my Doctor of Nursing Practice (DNP) degree through the University of Louisiana at Lafayette. The DNP is a terminal degree that focuses on developing a quality improvement project within my area of practice. The project that I am developing focuses on screening for delirium in the long term care setting. The setting where my project will be implemented is a skilled nursing facility (SNF) located within the Baton Rouge General Medical Center. Currently, I am proposing that all new admissions be screened for delirium using the Short Confusion Assessment Method (CAM) scale, developed by Dr. Sharon Inouye, within 24 hours of admission to the SNF, and with any change in cognition or mental status throughout hospitalization as my institution currently does not have any procedures or policies in place to screen for delirium. As recommended in the Short CAM training manual and coding guide, prior to screening for delirium with the CAM scale, individuals must undergo cognitive testing with an instrument such as the Mini-Cog.

In the past year, I have performed extensive research on delirium, and would like to request copyright clearance on use of the Mini-Cog prior to implementation of the Short CAM scale during my project implementation. I have read and understand that the Mini-Cog is under license with the University of Washington, and is intended solely for use as a clinical aide, and that any other use is strictly prohibited. Ultimately, I would like to publish my DNP project results in peer reviewed medical journals, and will be presenting my project among colleagues and professors at the University of Louisiana at Lafayette upon program completion. I will not be using the Short CAM scale, or the Mini-Cog for profit use, however, because I may publish results upon completion, I am requesting full copyright clearance of the Mini-Cog as of now. I am currently still in the developing stages of my project with planned implementation in the fall of 2015, with completion and analysis of results in the spring of 2016. Upon use of the Mini-Cog during project implementation, I will include appropriate copyright acknowledgement. If you need any further information regarding my project, and the intended use of the Mini-Cog, please do not hesitate to ask. I thank you for your time.

Sincerely,

Christine Hadeed, MSN, APRN, ACNP-BC, CCRN

Cell Phone: 225-978-6800
Email: ceh4537@louisiana.edu

Subject: Re: Requesting Copyright Clearance for Mini-Cog

Dear Ms. Hadeed,

Congratulations on pursuing the DNP degree! And thank you for your interest in the Mini-Cog. As copyright holder I am pleased to authorize its use in your research. You likely found a version of the Mini-Cog licensed for another use, containing language not appropriate for your application.

That said, it's important that the screen is administered and scored according to rules established in our validation work. Would you please let me know which form you plan to use?

Regards,
Soo Borson MD

From: Christine E Hadeed <ceh4537@louisiana.edu>
Sent: Sunday, March 1, 2015 7:58 PM
To: soob
Subject: Re: Requesting Copyright Clearance for Mini-Cog

Thank you Dr. Borson for your quick response. You are correct in that I have found numerous versions of the Mini-Cog, all of which reference you for copyright clearance. I have searched for the Mini-Cog using your name, and the University of Washington, however each scale that comes up does not appear to be original. I definitely want to ensure that I am administering and scoring the scale according to the rules you established. Being that there are so many versions of the Mini-Cog, I want to make sure that I am using the correct one. Can you possibly point me in the right direction as to where I can find the appropriate scale to use in my work? I will also spend time tomorrow researching further, so I may find it myself. Again, I greatly appreciate your help, and I would like to keep you posted on my work as it progresses being that use of your scale is vital to my project! and its success!

Sincerely,

Christine Hadeed

----- Original Message -----
From: "soob" <soob@uw.edu>
To: "Christine E Hadeed" <ceh4537@louisiana.edu>
Sent: Sunday, March 1, 2015 9:36:26 PM

Hi again,

There are two 'official' ways to get the Mini-Cog: from the Alzheimer's Association website (alz.org), which provides alternative word sets (for repeated use in the same people) and two clock times. Though it's 'official' it uses a cut point different from the one I validated against dementia diagnosis.

The original dementia screen cutpoint, using a score range of 0-5 (lower scores = impairment more probable), was 2 - so 0-2 high probability of dementia, 3-5 lower probability of dementia. Since then, we have found that a higher cut point (score 0-3) detects more people with clinically significant cognitive impairment (dementia plus MCI), though no study actually tested the higher cutpoint against formally established diagnosis. This is the one present on the alz.org site.

The second way to get an official version is for me to send it to you, and I've done that with this email. You can choose which cutpoint you will use; I recommend, for research studies, that you examine both when that seems appropriate for your purposes.

I am very interested in learning how your work progresses and hope you will keep me informed!
Best,
Soo

From: Christine E Hadeed <ceh4537@louisiana.edu>
Sent: Monday, February 15, 2016 1:59 PM
To: soob
Subject: Re: Requesting Copyright Clearance for Mini-Cog

Hello Dr. Borson,

I am pleased to let you know that I successfully implemented my Doctor of Nursing Practice Quality Improvement project last fall. My project was titled: Screening for Delirium in Long Term Care Settings. With your permission, I successfully used the Mini-Cog for a portion of my project. I am in my final semester of school at the University of Louisiana at Lafayette, and in the process of writing my final manuscript which is similar to a thesis/dissertation. This manuscript, which is titled the Doctor of Nursing Practice Project, will be printed and kept on file at my school, and it will also be submitted to the Proquest website. I wanted to ask your permission to include a copy of the Mini-Cog in my final manuscript? If you grant me this permission, can I mail you an official letter for you to sign and mail back to me? I will include the stamped envelope with my return address in the letter if you can let me know

where to mail it. If you prefer that I not include a copy in my manuscript I completely understand. I will only include it with your permission.

Sincerely,

Christine Hadeed, MSN, APRN, ACNP-BC, CCRN
Cell Phone: 225-978-6800
Email: ceh4537@louisiana.edu

Sent: Monday, February 15, 2016 6:08 PM

Hi Christine,

Congratulations on getting your project done! A major milestone! Re including a copy of the Mini-Cog in your project write-up, that's fine. You should include the form you used in the study. Just recently I created a 'universal' Mini-Cog form that will be used by everyone in the future and will appear on a new Mini-Cog website - but it will be more helpful to your readers to see exactly what you did.
This constitutes my permission!
Best,
Soo

Soo Borson MD
Professor Emerita, University of Washington School of Medicine and Affiliate Professor, School of Nursing

Appendix F

Steps for Delirium Project

1. Please screen all NEW ADMISSIONS using the Mini-Cog first, then the Short CAM scale within 24 hours of admission to SNF :)

2. The first thing you must do prior to screening is obtain patient or family consent. If the patient is cognitively sound, they can provide permission to participate. If the patient has a history of dementia, or is obviously confused (hence probably delirious), then we must obtain consent to participate from the patient's legally authorized representative (LAR). If you obtain consent from the LAR, go ahead and ask them the questions on the CAM scale as they will need to provide you with accurate answers. You will still need to screen the patient with the Mini-Cog so that Christine Hadeed can document the result of this scale :)

   You can briefly explain the project by stating the following:

   "We are currently implementing a project on our unit in an attempt to recognize cases of delirium that would otherwise go unnoticed. In order to do this we are asking patients if they will agree to be screened using the Mini-Cog, which assesses mental status, and the Short CAM scale, which assesses for delirium. This screening WILL NOT remain part of the permanent medical record. Patient confidentiality will be strictly maintained, and NO identifiable information will be recorded throughout the project. If the Short CAM scale indicates delirium, your physician or nurse practitioner will be notified for further assessment. Would you like to participate in the screening?" If yes, move on to step 3, if no, do not go any further and document on the CAM scale that patient decline participation, and place in the front of their green chart for Christine Hadeed to review.

3. After obtaining consent, proceed to screening the patient with the Mini-Cog to determine their mental status :) Place the completed scale in the front of the patient's medical record (green chart)

4. After screening with the Mini-Cog, proceed to screening the patient with the Short CAM scale :) Place the completed scale in the front of the patient's medical record (green chart). Please make sure that you date and initial the items located at the bottom of the CAM scale :)

5. If the CAM scale is negative, just file it in the patient's green chart and nothing else must be done.

6. If the CAM scale is positive, please document the patient's name, room #, admitting physician, and the date on the DAILY RECORD SHEET. This DAILY RECORD SHEET will keep a running tally of the positive CAM scales for each day. At 8AM the following day, please tape the DAILY RECORD to the physician/NP

documentation area for review. The HMG physician/NP will then be responsible for assessing the patient further, and giving any additional orders. Christine Hadeed will notify any provider outside of HMG of positive results, so please document all positive results on the daily record :)

Finally, please know that I, Christine Hadeed, will be here at least three times a week to assist all of you in any way that I can :) If you ever have questions, and I am not on the unit feel free to call my cell at 225-978-6800 :) I GREATLY appreciate all of you being so willing to help me succeed with my doctorate project :)

Appendix G

Daily Record for POSITIVE CAM Scales

DATE: _____

If the patient's CAM scale is positive, please document their name and information below. Every morning at 8AM, tape this document to the wall near the MD/NP charting stations for provider visualization. If the patient does not belong to HMG, Christine Hadeed will notify provider of positive CAM scale result ☺

Patient Name	Room #	Admitting MD	Date
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Appendix H

DNP Project Results

Research #	Gender	Age in Years (Mean =75)	Date of Admission	Mini-Cog (Y/N) (Score)	LAR notified (Y/N)	CAM within 24 Hours?	CAM - or +	If CAM + was Healthcare Provider Notified?	Was Patient Diagnosed with Delirium by Healthcare Provider?
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

Appendix I

Mini-Cog Screening Tool

MINI-COG ™

1) **GET THE PATIENT'S ATTENTION, THEN SAY: "May I check your memory? This will take some concentration.**
   I am going to say three words that I want you to remember now and later. The words are

   Banana Sunrise Chair.

   Please say them for me now." (Give the patient 3 tries to repeat the words. If unable after 3 tries, go to next item.)

   (**Fold this page back at the TWO dotted lines BELOW to make a blank space and cover the memory words. Hand the patient a pencil/pen).**

2) **SAY ALL THE FOLLOWING PHRASES IN THE ORDER INDICATED**: **"Please draw a clock. Start by drawing a large circle." (**When this is done, say) **"Put all the numbers in the circle." (**When done, say) **"Now set the hands to show 11:10 (10 past 11)."** If subject has not finished clock drawing in 3 minutes, discontinue and ask for recall items. *You may provide a separate sheet of paper for clock drawing; you may also present a pre-drawn circle to be completed as otherwise instructed.)*

---

3) **SAY: "What were the three words I asked you to remember?"**

_____ _____ _____

(Score 1 point for each) 3-Item Recall Score

Score the clock (see other side for instructions): Normal clock 2 points

Clock Score

Abnormal clock 0 points

Total Score = 3-item recall plus clock score ☐ ***0, 1, or 2 = clinically important cognitive impairment very likely;***

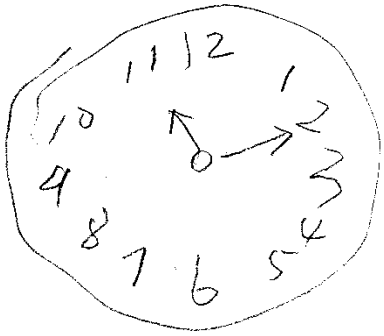
3, 4 or 5 = clinically important cognitive impairment less likely

CLOCK SCORING

NORMAL CLOCK A NORMAL CLOCK HAS ALL OF THE FOLLOWING ELEMENTS:

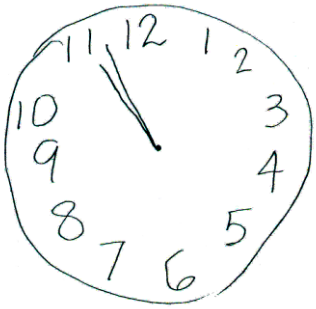
All numbers 1-12, each only once, are present in the correct order and direction (clockwise).

Two hands are present, one pointing to 11 and one pointing to 2.



ANY CLOCK MISSING ANY OF THESE ELEMENTS IS SCORED ABNORMAL. REFUSAL TO DRAW A CLOCK IS SCORED ABNORMAL.

SOME EXAMPLES OF ABNORMAL CLOCKS (THERE ARE MANY OTHER KINDS)



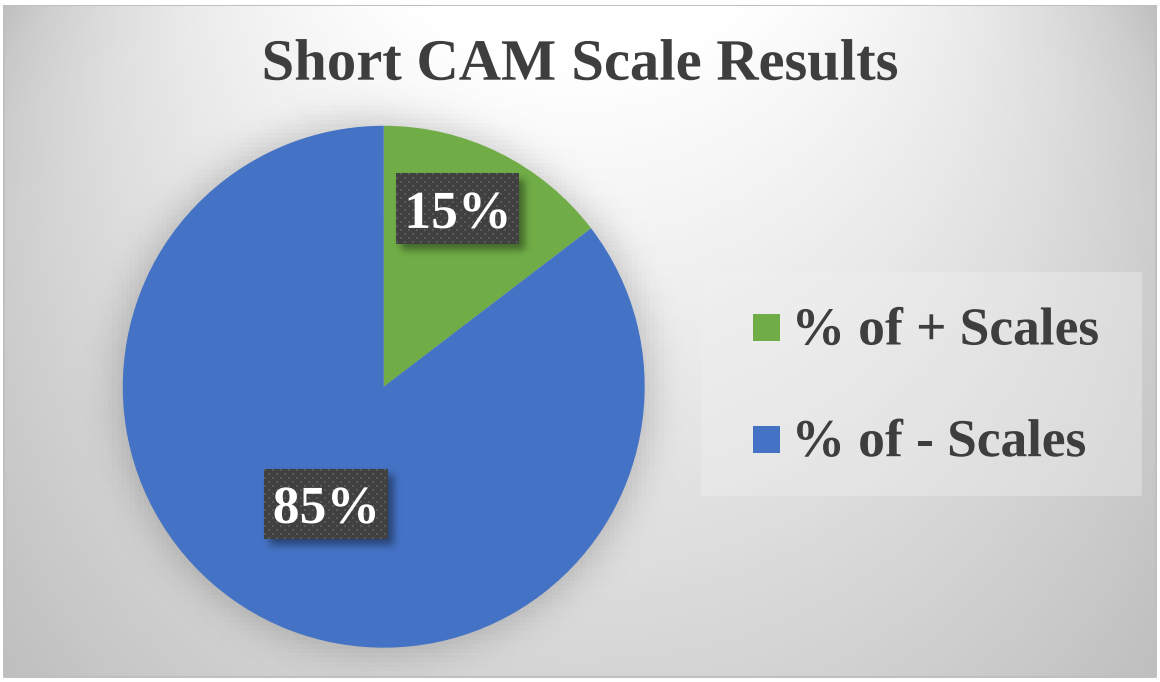
Abnormal

Hands

Missing Number

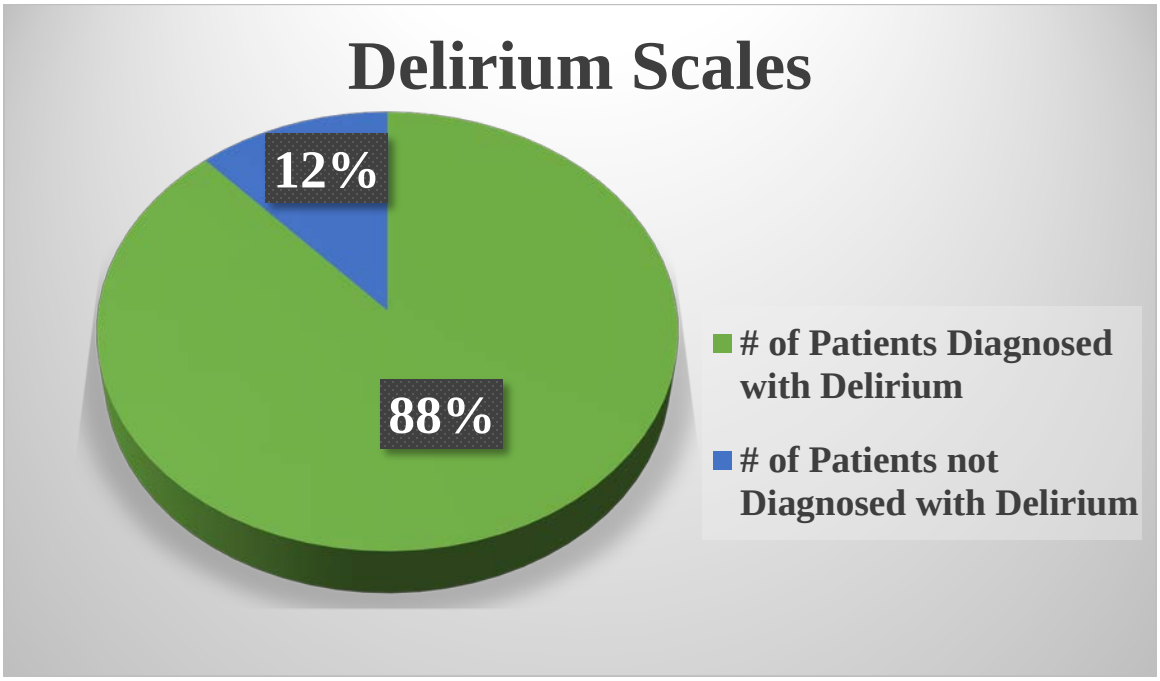
Appendix J

Short CAM Scale Results



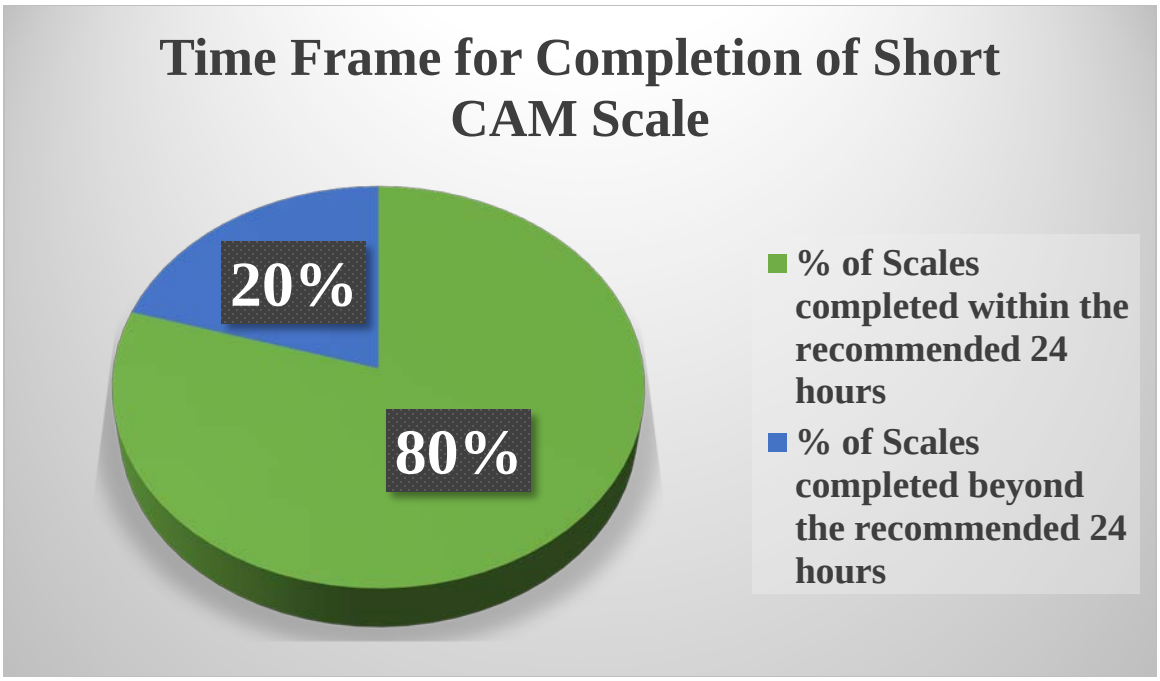
Appendix K

Delirium Scale Results



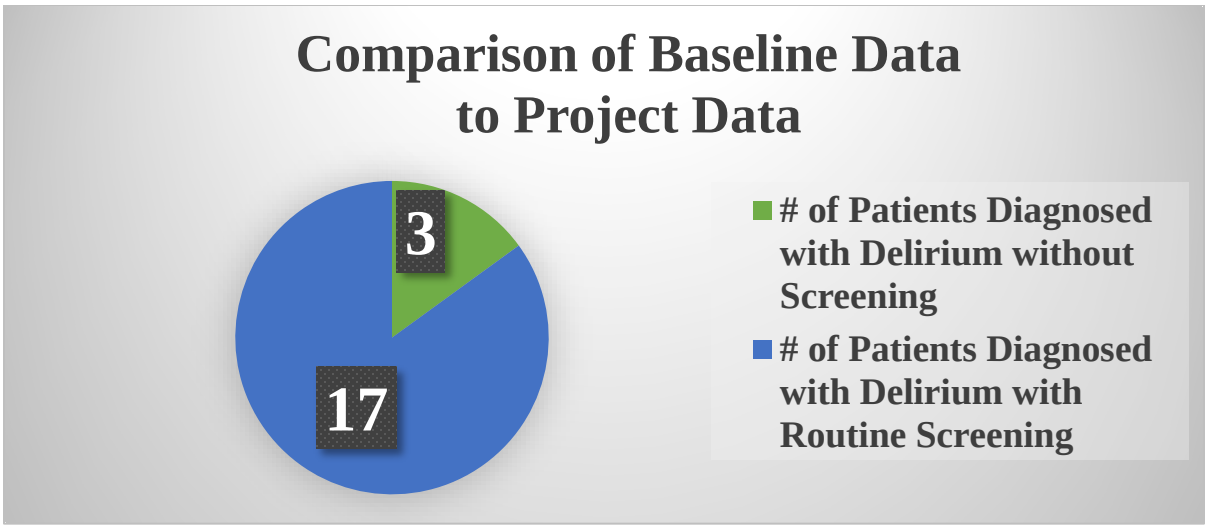
Appendix L

Time Frame for Completion of Short CAM Scale



Appendix M

Comparison of Baseline Data to Project Data



Hadeed, Christine. Bachelor of Science in Nursing, Southeastern Louisiana University, Spring 2003; Master of Science in Nursing, University of South Alabama, Fall 2012; Doctor of Nursing Practice, University of Louisiana at Lafayette, Spring 2016
Major: Nursing
Title of Dissertation: Screening for Delirium in Long Term Care Settings
DNP Synthesis Project Chair: Dr. Jeanne Cartier
Pages in DNP Synthesis Project: 94; Words in Abstract: 311

ABSTRACT

Background: Many of the patients who are admitted to long term care (LTC) settings, such as skilled nursing facilities (SNF), are often acutely ill, elderly, and have multiple co-morbidities. This predisposes these patients to an increased risk of developing delirium. Although delirium has been studied extensively in the acute care setting, it is not commonly studied within LTC settings. Rates of delirium in the LTC setting are as high as 70%; however, only 2.2% of cases are diagnosed. Currently, there are no screening protocols in use for detecting delirium on a SNF that is located in a metropolitan hospital in a southern state. ***Methods:*** A quality improvement project was conducted over an eight week period in the fall of 2015 in which 108 adult patients were screened using the Short Confusion Assessment Method (CAM) scale within 24 hours of admission to the SNF. Retrospective chart audits were performed for two weeks prior to implementing the Short CAM scale. This baseline data was compared to project data to determine if routine screening with the Short CAM scale is effective in identifying patients with delirium. Descriptive statistics were used to analyze project outcome data. ***Outcomes/Results:*** A total of 60 patients (n= 60) were screened during the baseline data collection period, of which only 3 patients (0.05%) were diagnosed with delirium without routine screening. Seventeen of the 108 participants (16%) who were screened during the project had a positive Short CAM scale, indicating that they

were exhibiting symptoms consistent with delirium. Of the 17 positive Short CAM scales, 15 (88%) were diagnosed with delirium. Results of this project show that screening for delirium, using the Short CAM scale, increased the detection rate on the SNF. Therefore, the Short CAM scale proved to be a reliable method for detecting early cases of delirium.

Keywords: delirium, long term care, skilled nursing facility, confusion assessment method, screening

Biographical Sketch

Christine Elizabeth Zoerner Hadeed was born in Baton Rouge, Louisiana on October 31, 1980 to Martha and Arthur Zoerner Jr. Christine graduated with her Bachelor of Science in Nursing from Southeastern Louisiana University in Hammond, Louisiana in 2003, with her Master of Science in Nursing in 2012 from the University of South Alabama in Mobile, Alabama, and with her Doctor of Nursing Practice in 2016 from the University of Louisiana at Lafayette in Lafayette, Louisiana. Christine currently practices part-time as an adult acute care nurse practitioner at the Baton Rouge General Medical Center, and is employed full-time as an undergraduate nursing instructor with Southeastern Louisiana University. On October 19, 2013 she married Kirk Hadeed.