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Reducing Delirium and Functional Decline in Hospitalized Older Adults: Implementation of CoCare HELP, An Evidence-Based Intervention

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Impact Statement: Delirium is associated with negative outcomes and high costs for patients, families, and hospital systems. The use of a reliable screening tool and evidence-based strategies such as CoCare: HELP demonstrates delirium prevention and functional decline in many geriatric hospitalized patients

8. Key Points

- Delirium in hospitalized older adults is associated with increased costs, increased length of stay, higher mortality rates, decreased cognitive and functional ability, and a higher likelihood of discharge to places other than home.
- Delirium is multifactorial; therefore, a multicomponent approach should be taken for prevention and treatment.
- Implementation of screening and preventative strategies, such as CoCare: HELP, will decrease delirium rate and prevent cognitive and functional decline, even at an adapted small-scale level.

Why does this matter?

An urban Midwestern hospital understands that delirium impacts the outcomes of the older hospitalized patient and is costly to patients, families, and the organization. A quality improvement project that includes a screening tool and CoCare HELP interventions has demonstrated a decrease in the rate of delirium in patients over 70 on two pilot units.

Abstract

Background: Delirium is a common disturbance in cognition among older adults in the hospital setting. It is associated with negative outcomes and high costs for patients, families, and hospital systems. Use of a reliable screening tool and evidence-based strategies such as CoCare: HELP demonstrates delirium prevention and functional decline in many geriatric hospitalized patients.

Objectives: This study examines the impact of implementing aspects of CoCare: HELP on two pilot units in an urban Midwestern hospital. Pre- and post-implementation measures of delirium rate, 30-day admission rate, length of stay, falls with injuries, safety attendant orders, restraint numbers, use of antipsychotics, and use of BEERS medications were tracked.

Methods: Mixed methods used to collect retrospective and prospective data for this quality improvement project. Quantitative data of adults 70 years and older from chart audits on two pilot units (n=25, n=25) established a baseline. Prospective data (n=106, n=123) collected after implementation and evaluated using SPSS to assess significance. Likert scales (n=23, n=9) used to assess impression and usability of assessment and interventions.

Results: Unit A delirium rate decreased from 32% to 9.75% (n=25, n=236), $p=.004$; Unit B rate decreased from 32% to 13.37% (n=25, n=187), $p=.034$. Two-sample Z tests of proportion showed statistical significance with $p<.05$. Descriptive statistics analyzed Pre and Post measurements.

Conclusions: Delirium rates decreased for both pilot units after implementation of bCAM screening and focus on patient orientation, sleep enhancement, mobility, and hearing

assistance. Other measurements varied in results. CoCare: HELP decreases delirium rate and full implementation is recommended.

Implications: This study supported four of the six CoCare preventative interventions along with the need for specific designated roles to coordinate, educate, and be a resource for units upon full implementation of CoCare HELP.

Keywords: Hospital Elder Life Program. Hospitalized older-adult delirium. Delirium Prevention. Delirium Assessment.

Introduction

Delirium is a sudden acute mental change characterized by rapid onset and fluctuating course of attention and affects more than 2.6 million older adults each year in the United States.^{1,8} Delirium has been identified in up to 30% of hospitalized adults, however, a recent study estimated the rate of undetected delirium to be as high as 60%.^{1,8} Along with its undesired prevalence, delirium negatively impacts patient and institutional outcomes including increased length of stay (LOS), higher mortality rates, declined cognitive and functional ability, and a higher likelihood of discharge to places other than home¹. Economically, delirium is associated with additional healthcare costs estimated at more than \$164 billion per year.⁸ Nationally, delirium has become a key component of patient safety agendas along with evolving into an indicator of healthcare quality for older patients.⁸ Studies support a multicomponent nonpharmacologic approach to prevent delirium as the most effective strategy.^{1,2,3}

Delirium is multifactorial; therefore a multicomponent approach should be taken for prevention and treatment. Inouye's multifactorial model for delirium (Figure 1) further explains the need for a multicomponent approach.^{4,7} The onset of delirium is related to the interaction of patient vulnerability (predisposing) factors and superimposed precipitating factors (noxious insults).⁴ Inouye's model describes how solely addressing single factors will not likely prevent or treat delirium; the full spectrum of vulnerability and precipitating factors need to be considered for optimal management.^{4,7}

The CoCare: Hospital Elder Life Program (HELP) is a bundle of evidence-based interventions targeting six risk factors for delirium: cognitive impairment, sleep deprivation, immobility, visual impairment, hearing impairment, and dehydration.^{2,5,9,10} Over 20 published studies have demonstrated HELP's effectiveness for preventing delirium and falls, reducing

cognitive and functional decline, shortening LOS, and decreasing institutionalization rates.^{4,5,6,7,10}

HELP has also shown to save over \$1000 per patient per hospitalization.^{4,7} HELP has been implemented in over 200 hospitals worldwide; adaptations may be required due to resource constraints and availability of volunteers and skilled interdisciplinary geriatric professionals.³

Health System Assessment

This project was a continuation of the previous work completed by Doctor of Nursing practice students which analyzed pre-implementation data (falls, LOS, readmission rate, restraint use, BEERS drugs, and delirium rate) among three units within an urban Midwest hospital health system. Previous results showed a high rate of falls (0.89/1000-days), length-of-stay (6.1 days), readmission rate (12.6%), restraint use (19197 hours), BEERs drugs prescribed (15.4%), and delirium (30.2%).¹¹ This data guided the decision to pilot CoCare: HELP on two different designated units within the same hospital previously examined.

An assessment of the two pilot units was performed guided by the Burke-Litwin Causal Model¹² with strengths, weaknesses, opportunities, and threats analyzed. The health system had an Expert Implementation Team (EIT) working to achieve Age Friendly Health System designation, which aligns with CoCare HELP.¹³ The organization was committed to reducing delirium and was supported by system leaders with unit staff expressing commitment to improving patient care. It was found that delirium screening was only being completed on ICU units; no non-ICU screening was available. Retrospective audits of adults aged 70 and older showed a delirium rate of 32% on each pilot unit, LOS of 7.3 days on unit A, 5.87 days on unit B; 6.15% antipsychotics prescribed on unit A, 6.28% prescribed on unit B; 35.21% BEERs medications on unit A, 38.96% on unit B. These measures demonstrated a need for delirium prevention, further supporting the implementation of CoCare: HELP.

Purpose

The assessment led to the clinical practice question: *How will the implementation of an evidence-based program prevent and reduce the incidence of delirium, 30-day admission rates, length of stay, falls with injuries, safety attendant orders, restraint numbers, use of antipsychotics, and use of BEERs criteria medications in those who are 70 years of age and older on two pilot units?* The purpose of this quality improvement (QI) project was to implement a smaller-scale intervention on two chosen pilot units, focusing on four of the six HELP strategies (orientation, sleep enhancement, mobility, hearing assistance) within the hospital that implemented CoCare: HELP. The goal was to prevent delirium and functional decline in the hospital's older adult population to demonstrate smaller-scale success for further support of a larger-scale implementation. The aims of this QI project were: (1) assess delirium prevalence in a cohort of non-ICU patients on two selected pilot units; (2) gather pre-implementation measures on selected pilot units; (3) implement a small-scale modified HELP program on pilot units without the assistance of volunteers; and (4) compare the pre-implementation measures with the post-implementation measures to guide the full implementation of CoCare: HELP in the future.

Methods

Mixed methods were used in this quality improvement project for evidence-based implementation. The setting was an urban hospital located in the Midwest. Two pilot units were selected for small scale implementation. Participants were hospitalized patients greater than or equal to 70 years of age at risk for delirium, health system leadership, EIT members, and clinicians; university faculty, staff, and students; and users of the intervention from other health systems.

Intervention

The hospital system selected the Brief Confusion Assessment Method (bCAM) to assess delirium for its non-ICU population. The bCAM is designed to improve delirium screening in the non-critically ill patients.¹⁴ It is adapted from the Confusion Assessment Method (CAM), which is widely regarded as one of the most effective screening tools for delirium in the hospital setting.^{15,16} The bCAM can be completed in less than two minutes and is designed to assess four features: (1) altered mental status or fluctuating course, (2) inattention, (3) altered level of consciousness, and (4) disorganized thinking (Figure 2).¹⁷ For the screen to be positive, the first and second features must be present along with the third and/or fourth.¹⁷ When the screening is completed by non-physician staff, the bCAM is 78% sensitive and 97% specific.¹⁵

With a shift to smaller scale approach, education on the bCAM was provided to the nurses on each pilot unit through voice-over PowerPoint presentations. Portions of the Hospital Elder Life Program (CoCare: HELP) were implemented to prevent delirium and assess functional decline.⁶ Due to the absence of volunteers and staff workload concerns, four direct evidence-based CoCare strategies were applied to basic nursing care. The nursing strategies focused on patient orientation, sleep enhancement, mobility, and hearing assistance.

Approach

This project contained a two-phase implementation plan, consisting of short-term and long-term stages.

During stage one, the DNP students performed chart review audits to calculate the baseline delirium rates on the two pilot units. BCAM education was provided to the pilot units pre-implementation and interventions were scaled down to allow staff to perform aspects of the HELP program without the presence of volunteers. Registered nurse (RN) champions were identified to promote implementation strategies on the units.

Stage two, designed for longer-term implementation includes EIT members, geriatric specialty physicians, nursing senior leadership team, operations, and finance as key stakeholders. A neighboring university has plans to offer coursework that will supply and educate nursing student volunteers to the hospital system.¹¹ Possible recommendations for full deployment include adding two units per month for ten months. This will allow for full deployment by May 2024. Performance measures to track include LOS, readmission rate, falls, falls with injury, and use of safety attendants at the bedside.

The HELP program relies on volunteers, an elder life nurse specialist (ELNS), and an elder life specialist (ELS), as well as a supply of volunteers to carry out the assessments and interventions laid out by the program. The hospital system was seeking approval for the hiring of the ELNS and ELS positions at the beginning of the project implementation and was unable to provide the volunteers needed. The authors agreed to find and engage champions and take on the role of the ELNS and ELS while streamlining the interventions to allow existing staff to focus on orientation, sensory impairment, sleep enhancement, and mobility to attempt to decrease delirium on two pilot units.

Measures

The Ultra-Brief Confusion Assessment Method (UB-CAM) was used to audit charts (N=25, N=25) to establish the baseline delirium rate. UBCAM has a sensitivity of 93% and specificity of 95% for detection of delirium.¹¹ The bCAM is 78% sensitive and 97% specific and was used to audit charts post-implementation.¹⁵ The system-based measures were average length of stay, readmission rate, and safety attendant orders. Patient outcome-based measures were falls, falls with injury, restraint hours, restraint numbers, BEERs meds, and anti-psychotic meds. The data was compared to the pre-implementation data obtained. A 2-sample Z-test of proportions

was run to assess for statistical significance of delirium rate ($p < .05$). Post implementation surveys were conducted on each unit using a Likert scale to assess staff impressions of the screening tool and interventions.

Data Collection

Chart audits, interviews, and surveys provided retrospective and prospective data on the organization, pilot units, and various stakeholders. The organization provided retrospective financial, patient data, and prospective patient data. The Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) guided the systematic review on champion engagement strategies.¹⁸⁻²⁶ (Table 1). Post implementation data of bCAM positivity rate and patient data were compiled through the dates of 10/18/22 through 12/31/22 and compare to data obtained previously 10/1/21 through 4/30/22 (Table 2).

Analysis

Using a mixed methods design, qualitative data were compared pre-implementation measures with post implementation on the two pilot units. Findings were displayed with charts and graphs. Data were analyzed using SPSS and significance was determined if a p value was < 0.05 . Qualitative data were obtained and analyzed by staff surveys using a Likert scale.

Ethical Considerations

Internal Review Board non-human research determination was obtained from both the university and the organization. This was determined to be a quality improvement project by both entities. Identifiable data were stored on a health system drive and de-identified prior to analysis.

Results

Unit A delirium rate decreased from 32% to 9.75% (n=25, n=236). A Two-sample Z test of proportions was statistically calculated for delirium rate using SPSS: Pearson Chi-squared was 10.696 but assumptions were not met; Fisher's exact test was used with a p value of .004. This was statistically significant. Descriptive data are shown in tables (see table 2). Average length of stay increased from 7.3 to 8.79 days. Fall rate decreased from 0.13 to .097. Readmission rate decreased from 0.48 to 0. There was a decrease in total antipsychotics prescribed from 6.15% to 3.42%. There was an increase in total number of BEERS medications prescribed 35.21% to 57.79% with the highest increase in benzodiazepines. Hours of restraint use decreased from 936.44 to 341.47 and number of patients restrained decreased from 28 to 2. Orders for safety attendants decreased from 10 to 5.23. Likert scales were completed by RNs to qualitatively analyze themes (see Figure 3). Comments included: "I didn't see interventions come up for positive screening. It would be helpful to have a pop up that guides care when patients are positive like the sepsis screening. I was unaware of interventions; didn't have training on bCAM, just told about it," and "no training involved, just told us to do it."

Unit B delirium rate decreased from 32% to 13.37% (n=25, n=187). A two-sample Z test of proportions was statistically calculated for delirium rate using SPSS: Pearson Chi-squared was 5.824 but assumptions were not met; Fisher's exact test was used with a p value of .034. This was statistically significant. Descriptive data are shown in tables (see table 2). Average length of stay decreased from 5.87 to 5.44 days. Fall rate increased from 0.15 to 0.23. Readmission rate decreased from 0.53 to 0. There was an increase in total antipsychotics prescribed from 6.28% to 7.34%. There was an increase in total number of BEERS medications prescribed 38.96% to 53.67% with the highest increase in benzodiazepines. Hours of restraint use decreased from

954.09 to 116.34 and number of patients restrained decreased from 26 to 7. Orders for safety attendants increased from 0 to 3. Nine Likert scales were completed by staff RNs (Figure 3).

Discussion

Delirium rate decreased in both units significantly while strengthening overall unit awareness of delirium and its impact on patients and system. Unit A saw decreases in fall rate, readmission rate, total antipsychotic use, hours restrained, number of patients restrained, and orders for safety attendants after implementation; however, there were increases in LOS and BEERS medications. Unit B saw decreases in LOS, readmission rate, hours of restraints, number of restrained patients, and number of orders for safety attendants; however, there were increases in fall rate, total antipsychotic use, and BEERS medications. While results of this smaller scale implementation are not generalizable, similar hospital systems can interpret these results to determine if CoCare HELP® would be beneficial along with potential modifications of the program due to financial constraints.

Limitations

Limitations for this project included barriers to education, implementation, and data. Originally, education regarding delirium and proper bCAM screening was planned to be dispersed to RNs through the organization's required education module system. The timing overlapped with annual compliance training and the system did not allow new education to be uploaded and required for RNs during that time. The delirium and bCAM education module was dispersed via email and posted to the unit's shared website. There was no way to determine if RNs viewed the education or verified their competence on using the bCAM for delirium screening. Chart audits suggested that RNs were charting bCAM screening tool as required, but

not always using it when a patient's status changed. This likely contributed to user error and under screening of patients.

There was a significant difference in pre- and post- implementation delirium rates. One explanation for this could be that the increased awareness of delirium prevention throughout the unit and preventative strategies did decrease rate. It should be noted that pre-implementation audits completed were over a limited time frame of one month and chosen at random; the post-implementation audits were completed on all of the patients 70 years and older during the implementation timeframe of three months. Since there was no standardized screening tool in place, pre-implementation audits were completed using a different screening method. Pre-implementation data were over six months while post-implementation data were over three months; descriptive data may not be accurately depicted due to differences in collection timeframes.

Sustainability

Sustainability of this project requires a strong focus on required education for proper delirium screening and prevention to unit staff. To ensure sustainability when implementing the full CoCare: HELP program, it will be vital to coordinate with the collaborating university for volunteers. This project supports the need for designated paid positions to function as a resource for staff, families, and volunteers once full implementation of CoCare: Help begins. Expectations remain to save hospitals money while improving on patient and system outcomes.

Through word of mouth, people offered suggestions for moving forward including 'delirium precautions,' a delirium order set, and changes to medication orders. Results reported to EIT included suggestions for designated roles to coordinate, manage, and educate for full

system CoCare HELP implementation. Plans to start a university course to provide volunteers is tentatively scheduled for fall 2023, along with hiring paid CoCare positions.

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Tables

Table 1: Champion Engagement Strategies

	Champion Engagement Strategy	Mapping Strategy on CFIR Framework
1	Build a coalition	Inner Setting
2	Asses for readiness; identify barriers/facilitators	Process, Inner Setting
3	Create a learning collaborative	Inner/Outer Settings
4	Recruit, designate, and train leadership	Inner setting, process
5	Identify and prepare champions (units)	Process
6	Develop educational materials	Inner/Outer Setting, Planning
7	Conduct educational meetings	Inner Setting, Intervention, Process
8	Facilitation	Process, Intervention
9	Provide supervision (clinical)	Process, Intervention
10	Ongoing consultation (clinical)	Process, Intervention
11	Promote adaptability (clinical)	Intervention
12	Audit & feedback	Process, Inner Setting
13	Purposefully re-examine the implementation	Process, Intervention

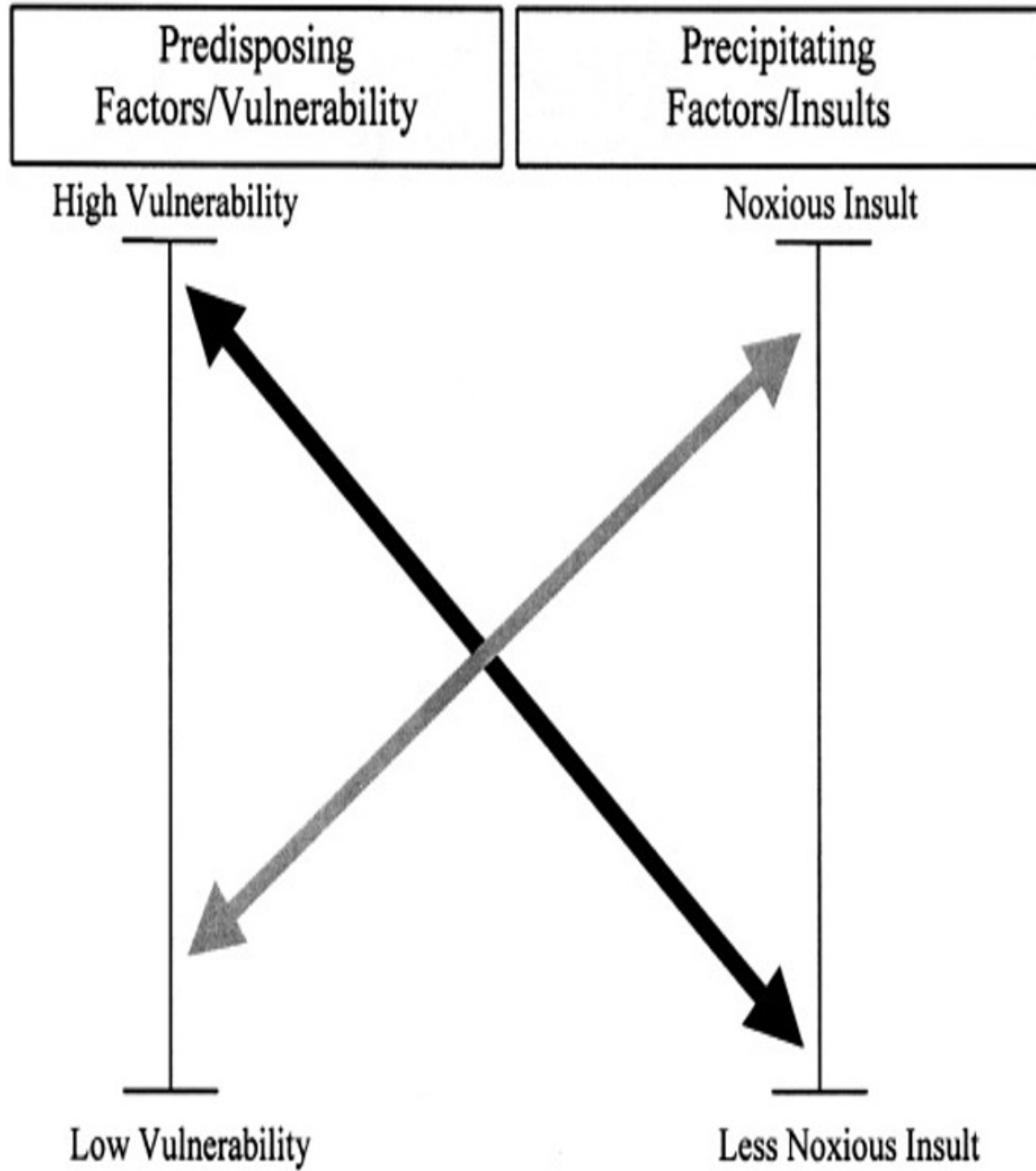
Table 2: Measures and Outcomes for Units A and B

Measures	Unit A	Unit A Post	Increase or Decrease	Unit B	Unit B Post	Increase or Decrease
Delirium Rate	32%	9.75%	Decrease	32%	13.37%	Decrease
Ave. Length of Stay (days)	7.3	8.79	Increase	5.87	5.44	Decrease
Fall Rate	.13	.097	Decrease	.15	.23	Increase
Readmission Rate	.48	0	Decrease	.53	0	Decrease
Total Antipsychotics	6.15%	3.52%	Decrease	6.28%	7.34%	Increase
BEERS Medications	35.21%	57.79%	Increase	38.96%	53.67%	Increase
Hours of Restraint Use	936.44	341.47	Decrease	954.09	116.34	Decrease
Number of Patients Restrained	28	2	Decrease	26	7	Decrease
Safety Attendant Orders	10	5.23	Decrease	0	3	Increase

To establish a baseline delirium rate for each pilot unit, a manual chart audit was performed by the current DNP students. 25 chart audits were completed for the pre-implementation data (charts chosen at random) and all charts were audited for the post implementation time frame using the bCAM charting completed by RNs. Unit A Post Implementation chart audits 70+ N= 236. Unit B Post Implementation chart audits 70+ N= 187.

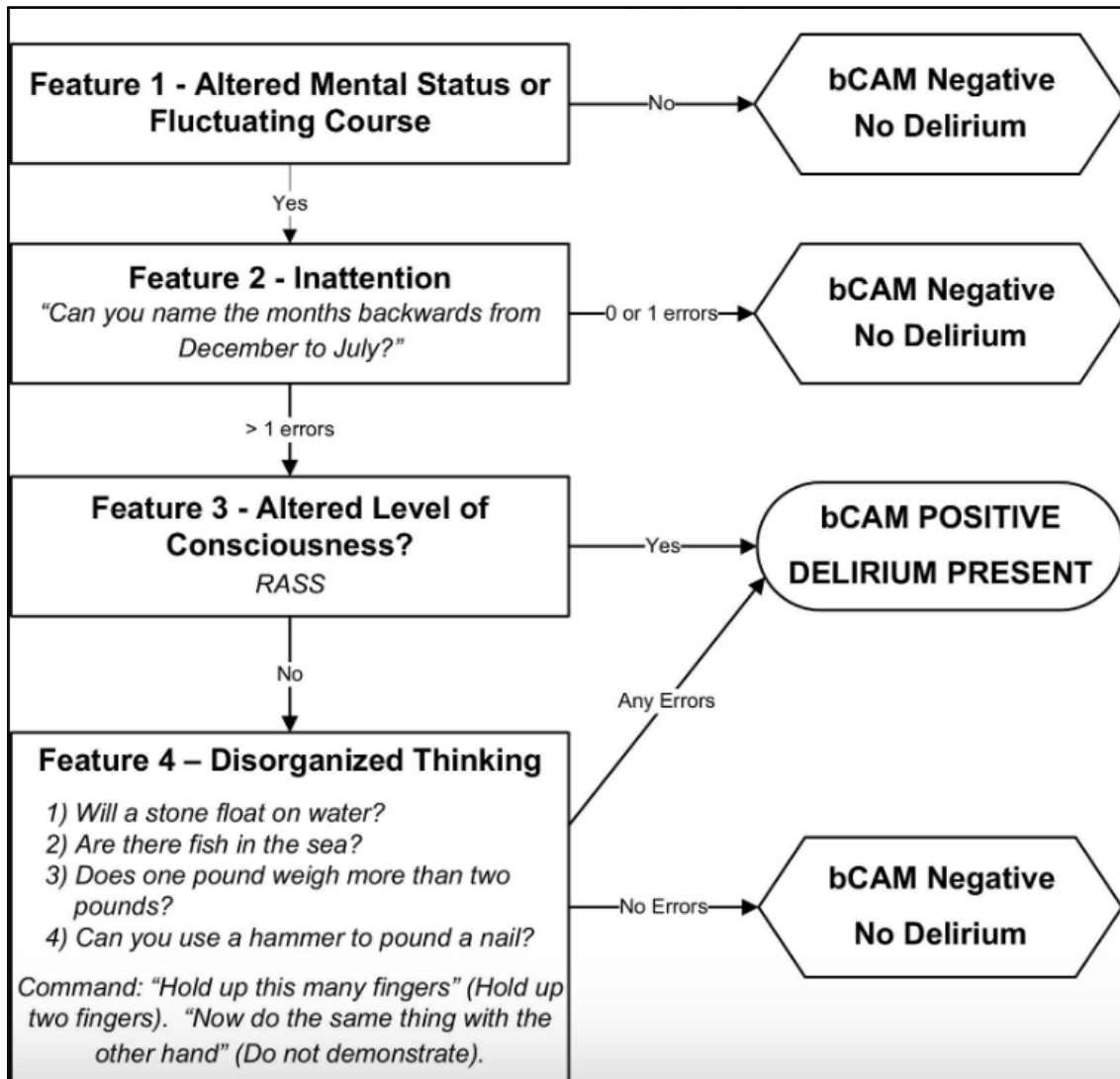
Figures

Figure 1: Inouye Multifactorial Model of Delirium



Ultimately, improved care for patients with delirium could occur by identifying predisposing factors and risks and enacting evidence-based interventions.

Figure 2. b-CAM: a brief cognitive screen with 4 features.



The bCAM is a valid and reliable instrument with four features selected by the health system for routine assessment on non-ICU units. To be considered delirious, a patient must be positive for features one and two, and well as three and/or four.¹⁷

Figure 3: Post Implementation RN staff Survey

