Prevention of Delirium in the Non-ICU Hospitalized Patient

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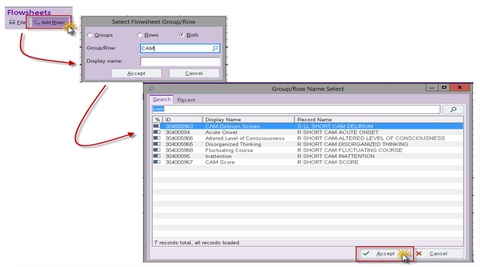
Abstract

- Delirium is an under recognized and poorly managed condition attributable to delayed or nonstandard approaches to prevention, diagnosis and treatment. This preventable, acute decline in cognitive function affects up to 80% of hospitalized seniors in the intensive care unit (ICU) and 30% in the medical non-ICU unit. Leads to decreased quality of life, loss of independence, a 30% mortality rate, and costing Medicaid over $164 billion per year in the United States.
- Most hospitals do not have delirium prevention programs or protocols are inconsistently implemented. Previous studies found contradicting findings on the use of nursing interventions for delirium prevention.
- The purpose of this study was to implement a delirium prevention tool for the non-ICU setting to decrease incidence of delirium and reduce hospital length of stay in geriatric patients aged 65 years or older.
- This quality improvement study utilized an interrupted time series analysis of 581 patients aged 65 years or older admitted to non-ICU 4100 unit at Riverside University Health System (RUHS).
- Delirium incidence and risk factors at RUHS is similar to other institutions. The use of a delirium prevention protocol may increase nursing activities. Further results pending. Future studies include the use of standardized interventions of the Hospital Elder Life Program in hopes of improving diagnosis, prevention, and treatment of delirium at RUHS.

Background

- Riverside county is the 4th largest county in California and is comprised of an estimated 2.4million people, of which 14.1% or 340,000 people are 65 years or older.
- Delirium is linked to increased morbidity and mortality, decrease quality of life, increased hospital length of stay, and costs more than $6.9 billion of Medicare expenditures annually.
- This preventable, acute decline in cognitive function affects up to 80% of hospitalized seniors, age 65 years old or more, in the intensive care unit (ICU) and from 6% to up to 30% in the medical non-ICU unit.
- The Confusion Assessment Method (CAM) is a standardized delirium screening tool used for diagnosis of delirium, with sensitivity of 81% and specificity of 98%, but remains difficult to use due to lack of training and poor communication among patient care team.
- Delirium remains highly under recognized and thus highly undertreated due to non-standardized approaches to diagnosis and treatment as well as pack of prevention programs or inconsistent implementation.
- The purpose of the present study is to find a delirium screening protocol that is most effective for our medical center and develop a standardized delirium prevention protocol for future use.
- We hope to improve prevention, diagnosis and treatment of delirium at RUHS while focusing on better patient outcomes.



CAM delirium diagnostic tool in EPIC from the Charting Flowsheet

Materials & Methods

Design

- This quality improvement study utilized an interrupted time series analysis of 348 geriatric patients aged 65 years or older admitted to non-ICU 4100 unit at Riverside University Health System (RUHS) Medical Center.
- Patients less than 65 years old and patients not admitted to the 4100 unit were not included in this study.
- Interventions included nursing completion of delirium screening tool, which included standard nursing activities and the CAM tool, and nursing education.
- Two-tailed t-tests for significance of p <0.05 to compare three time series of (1) pre-intervention, (2) delirium screening tool only, (3) delirium screening tool and nursing education with formal ppt presentation and discussion.

Subjects

Inclusion Criteria:

- All patient's age 65 or older who are randomly assigned to and admitted to RUHS-MC 4100 Unit based on random assignment.

Exclusion Criteria:

- Age less than 65, any patient not admitted to 4100 unit, once transferred out of 4100 unit.

Control:

- Number of delirium diagnoses prior to interventions, obtain via EPIC query.

Sample Size:

- 348 participants were included in study from three time periods:

1. October 2016 to September 2017 for preintervention.
2. October 2017 to January 2018 for intervention with delirium screening tool only.
3. December 2018 to March 2019 for intervention with delirium screening tool and nursing staff education.

Procedures

Method:

- Delirium screening worksheet (*Figure 1*) to be completed by 4100 nursing staff every 12 hour shift for 3 months, followed by nursing staff education then completion delirium screening worksheet.
- If any questions of the Confusion Assessment Method (CAM) screens YES, nursing staff to notify primary team.

Data analysis:

- Interrupted time series analysis of data comparing pre- and post-intervention outcomes using statistical analyses of independent samples two-tailed t-tests for significance of p <0.05 with confidence intervals, comparing three time series of delirium screening tool only and delirium screening tool and nursing education.

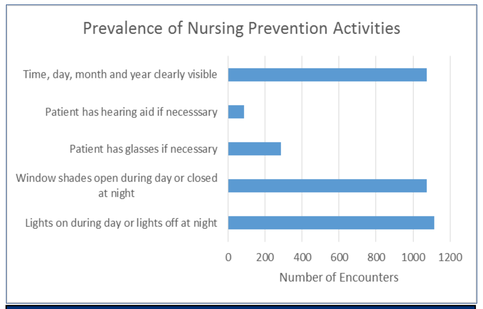


***Figure 1**. Prevalence of Nursing Prevention Activities performed per nursing shift*

Delirium Prevention Worksheet

Patient Initials:_____ Patient MRN:_____ Patient DOB:_____ Unit/Room#_____

Date:_____ Time of Assessment:_____

Complete form on patients age 65 years or older only. Age: _____

(A) Delirium Risk Factors	Findings	
1. Is the patient admitted for surgery and/or a procedure?	YES	NO
2. Is there a urinary catheter in place?	YES	NO
3. Does the patient have an underlying Dementia or Neurocognitive disorder?	YES	NO
4. Is the patient in physical restraints?	YES	NO
5. Does the patient require glasses and/or contacts?	YES	NO
6. Does the patient require hearing aids or have hearing difficulties?	YES	NO

(B) Delirium Prevention Checklist *(check when completed)*	Findings		
1. Are the lights on in the patient's room (if during the day) or off (if at night)?	YES	NO	N/A
2. Are the window shades open (if during the day) or closed (if at night)?	YES	NO	N/A
3. Does the patient have his or her glasses (if necessary)?	YES	NO	N/A
4. Does the patient have his or her hearing aid (if necessary)?	YES	NO	N/A
5. Is the time, day, month, and year clearly visible to the patient?	YES	NO	N/A

If N/A to any of the above, please explain:

(C) Confusion Assessment Method (CAM)	Findings	
1. Is there evidence of an acute change in mental status from patient's baseline?	YES	NO
2. Did the patient have difficulty focusing attention or having difficulty keeping track of what was being said?	YES	NO
3. Was the patient's thinking incoherent, illogical, or disorganized?	YES	NO
4. Is the patient hyperalert or very difficult to arouse (i.e., the patient is not waking up or very difficult to keep awake)?	YES	NO

If YES to any of the above, notify primary team that patient likely has delirium and go to section (D)

(D) Recommendations for Nursing *(check when completed)*

1. ☐ Notify primary team
2. ☐ Fall precautions
3. ☐ Orient patient throughout the day
4. ☐ Encourage family visitations
5. ☐ Minimize sleep interruptions at night

Increased observation of patient is provided by:

11. ☐ 1:1 Sitter
12. ☐ Rounder

6. ☐ Have familiar objects or photos brought from home
7. ☐ Reduce clutter and noise
8. ☐ Provide adequate lighting
9. ☐ Physical Therapy consult to increase mobility
10. ☐ Check whether hearing/vision aids are accessible to patient

Indicate if the patient was:

13. ☐ Transferred to a different unit: _____
14. ☐ Discharged

If any of the above were not completed, please explain:

Comments:

Print and Signature (RN):

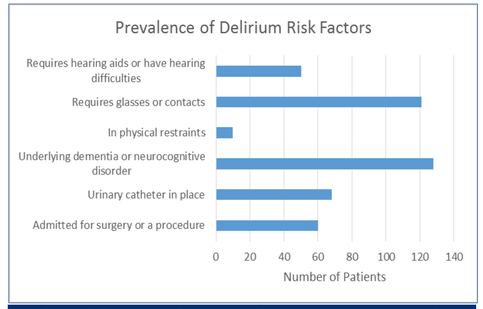


***Figure 2**. Prevalence of delirium risk factors present in patient sample*

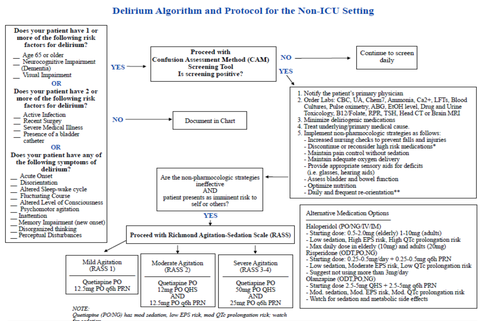


***Figure 3**. Proposed Delirium Algorithm for the Non-ICU Setting at RUHS*

Results

Primary Outcomes

Incidence of delirium:

- This study found at total of 23 patients (6.6%) positive CAM on delirium screening tool.
- 18 patients (6.5%) screened positive on CAM tool using delirium screening tool only and 5 patients (7.1%) using delirium screening tool and nursing staff education.
- There was not a significant difference between groups, defined as $p<0.5$. (two-sample t(69,277) = -0.20, p = 0.84).

Hospital length of stay:

- EPIC query is pending

Secondary outcomes

Number of nursing prevention activities:

- The average number of prevention activities performed were 3.1 of 5.
- An average of 2.2 activities were completed for positive CAM patients when compared to 3.2 activities for negative CAM patients.
- There were more activities completed with tool plus education versus tool only (3.2 versus 3.1).
- The most used prevention activity was turning lights on during the day and lights off at night.
- The least used prevention activity was patient having hearing aid *(Figure 1)*.

Patient risk factors for delirium:

- The average number of risk factors was 0.82 per patient, with delirium patients average 1.1 risk factors vs no delirium average 0.82 risk factors.
- The most common predisposing risk factors for delirium was dementia or underlying neurocognitive disorder and the least common was physical restraints *(Figure 2)*.

Hospital cost: Results pending EPIC query.

Falls: Results pending EPIC query.

Discussion

- CAM positive screening as probable delirium incidence was found to be similar to previous studies, 6.6% compared to expected of 6% to 28% for the medical non ICU hospitalized patient.
- Although insignificant difference was found, the percentage of CAM positive was higher for tool plus education vs education only, in the setting of similar number of prevention strategies performed.
- EPIC query for ICD 10 codes for delirium is pending.
- The use of more nursing prevention strategies is consistent with extensive studies of the effectiveness of using supportive, nonpharmacological interventions to prevent delirium. Nursing education resulted in increased number of prevention activities used with consideration to limitation of accessibility of activities
- The more risk factors for delirium, the more likely was the patient to develop delirium.
- Limitations of this study included limited patient population to 4100 medical unit at a county-based medical center.
- Nursing prevention strategies may be inconsistently used and reported during this study, thus there is a need for standardization of non-pharmacological interventions.
- These interventions are standardized and validated in the Hospital Elder Life Program (HELP), which includes meeting needs for nutrition, fluids and sleep, promoting early and safe mobility, and providing adaptations for hearing and vision impairments.

Conclusion

- Preventing delirium not only improves patient quality of life and decreases mortality and morbidity, but is an important aspect of the Agency for Healthcare Research and Quality (AHRQ) as a marker for quality of care and patient safety.
- This study shows that the use of delirium screening tool may decrease the complications associated with delirium in the medical non ICU floor given earlier interventions.
- Delirium incidence and risk factors at RUHS are similar to previous studies.
- Implementation of HELP at RUHS may further decrease delirium incidence, reduce hospital length of stay, and decrease hospital costs by standardizing nonpharmacological delirium interventions.
- Further findings to be discussed, pending completion of EPIC query.

Future Direction

- Future studies include the use of standardized interventions of the Hospital Elder Life Program in hopes of improving diagnosis, prevention, and treatment of delirium at RUHS, improve geriatric patient quality of life and daily function, decrease hospital length of stay, and decrease hospitalization costs with emphasis on patient-centered care team.
- The RUHS Volunteer Service would of community members that would be trained by the nursing staff on how they could assist them implementing certain interventions like opening the blinds, providing patients with the hearing aids, etc.
- Use of the proposed delirium algorithm, shown below *(Figure 3)*, by physicians and care teams may improve the management of delirium.
- The utilization of the standardized CAM delirium diagnostic tool into EPIC medical records at RUHS may assist with the diagnosis of delirium.

References

- Leslie, D. L. (2008). One-Year Health Care Costs Associated With Delirium in the Elderly Population. *Archives of Internal Medicine,168*(1), 27.
- Inouye, S. K., Westendorp, R. G., Saczynski, J. S., Kimchi, E. Y., & Cleinman, A. A. (2014). Delirium in elderly people. The Lancet, 383(9934), 2045.
- Reuben, D. B., Inouye, S. K., Bogardus, L., & Cooney, L. M. (2000). MODELS OF GERIATRICS PRACTICE; The Hospital Elder Life Program: A Model of Care to Prevent Cognitive and Functional Decline in Older Hospitalized Patients. *Journal of the American Geriatrics Society,48*(12), 1697-1706.
- Inouye, S. K., MD., MPH, Bogardus, S. T., Jr., M.D., Charpentier, & Leo-Summers, L., M.P.H. (1999). A Multicomponent Intervention to Prevent Delirium in Hospitalized Older Patients. *New England Journal of Medicine, 340*, 669-676.
- Fong, T.G. et al (2011). Delirium in elderly adults: Diagnosis, prevention and treatment. *Nat Rev Neurol, 5(4), 210-220.*
- HELP University | Hospital Elder Life Program. (2019). Retrieved from https://www.hospitalelderlifeprogram.org/help-university