# Improving Nurses' Recognition of Delirium in Geriatric Populations

## Introduction & Background

**Delirium.** An acute confusional state characterized by a fluctuating mental state and cognitive impairment (Tieges et al., 2017).

- Overlooked in 30-75% of hospitalized geriatric patients (Middle & Miklancie, 2015)
- Increases risks of morbidity and mortality, length of stays, and healthcare costs (Weng et al., 2019)

Geriatric population. Comprises 16% of the general population of the US – will increase to 23% by 2060 (U.S. Census Bureau, 2011) Cost of delirium incidence in hospitals.

- >\$60,516 per patient
- >\$143 billion per year (Leslie et al., 2008).

Current Training Protocols. The project site did not have a standardized educational module to address delirium in the geriatric population.

### **Review of literature.**

- Nurse educational interventions improves confidence and competence in identifying delirium symptoms (LaFever et al., 2015).
- The 4 AT cognitive assessment instrument is the most effective but often underutilized for recognizing delirium (Shenkin et al., 2018).
- An online module is an effective resource to equip nurses with the proper delirium knowledge and assessment instrument (Van de Steeg et al., 2015).
- Improved delirium recognition improves health outcomes for this hospitalized geriatric patients (Destroyer et al., 2018).

## Purpose & Aims

The purpose of this quality improvement project was to implement and evaluate a structured delirium educational program.

Aim 1. Enhance nurse knowledge of the early signs and symptoms of delirium, as measured by a Delirium Knowledge Questionnaire (DKQ) in pretest and post-test phases.

Aim 2. Improve the utilization and frequency of the 4AT cognitive assessment instrument in hospitalized geriatric patients, measured by self-reporting data over a period of four to eight weeks.

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## Methods

Setting. Two inpatients 28 beds medical-surgical units at an urban academic medical center in the Mid-AtlanticParticipants. Nursing staff members• Pre-test phase: $N=43$ • Post-test 1 phase (immediately after intervention): $N=38$ • Post-test 2 phase (4-8 weeks after intervention): $N=20$ Measures• Demographic Questionnaire - 8 items• DEWQ - 13 items, yes/no answers• The 4AT Cognitive Assessment Instrument - 4 items, yes/no answersIntervention. Online delivitum educational module• 20-minute online module including instructional lectures, a case scenario $\frac{Nerasteristic}{18-30}$ $\frac{Nerasteristic}{18-30}$ $\frac{18.50}{31.40}$ $31.40$ $9$ $20.9$ $Regange$ $\frac{18.50}{11-50}$ $10$ $23.3$ $51-60$ $51.50$ $51.50$ $51.50$ $52.5$ $12$ $27.9$ Registered Nurse $34$ $79.1$ $41$ $41$ $92.09$ Registered Nurse $34$ $79.1$ $41$ $42$ $42$ $43$ $71$ $6-10$ $7$ $16.3$ $11-15$ $6$ $14.0$ $12$ $27.9$ $82$ $82$ $83$ $84$ $84$ $84$ $84$ $85$ $12$ $27.9$ $85$ $812$	Design. Pre-Post interv	ention qu	uality impro	vement project			
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## Results

### Pre-test to Post-test 1 DKQ Summary Score

- Median score improved by 1.0 point
- Results not statistically significantly different between median pre-test and post-test 1 summary score (p=0.580)
- Pre-test to Post-test 2 DKQ Summary Score • Median score improved by 0 point
- Results not statistically significantly different between median pre-test and post-test 2 summary score (p=0.761)



### **Utilization of The 4AT Cognitive** Assessment Instrument

- Results from a descriptive statistics indicate that the delirium education module clinically improved utilization and frequency of the 4AT cognitive assessment instrument among nurses in medical-surgical units.
- The post-test 1 group
- 45.2% (n=14) utilized 4AT
- 54.8% (n=17) did not utilize 4AT
- The post-test 2 group • 64.6% (n=11) utilized 4AT
- 35.3% (n=6) did not utilize 4AT

## Conclusions

## **Clinically-meaningful implications**

## **Project limitations**

- Relatively small sample sizes

### References

Detroyer, E., Dobbels, F., Teodorczuk, A., Deschodt, M., Depaifve, Y., Joosten, E., & Milisen, K. (2018). Effect of an interactive E-learning tool for delirium on patient and nursing outcomes in a geriatric hospital setting: findings of a before-after study. British Medical Columbia geriatrics, 18(1), 19. https://doi.org/10.1186/s12877-018-0715-5 LaFever, S., Bory, A., & Nelson, J. Delirium in patients with cancer: What nurses need to know to improve care. Clinical Journal of Oncology Nurses, 19(5), 585-590. https://doi.org/10.1188/15.CJON.585-590 Leslie, D. L., Marcantonio, E. R., Zhang, Y., Leo-Summers, L., & Inouye, S. K. (2008). One-year health care costs associated with delirium in the elderly population. Archives of Internal Medicine, 168(1), 27-32. https://doi.org/10.1001/archinternmed.2007.4 Middle, B. & Miklancie, M. (2015). Strategies to improve nurse knowledge of delirium: A call to the adult-gerontology clinical nurse specialist. *Clinical Nurse* Specialist, 29(4), 218-229. https://doi: 10.1097/NUR.000000000000138 Tieges, Z., Evans, J. J., Neufeld, K. J., & MacLullich, A. M. (2017). The neuropsychology of delirium: Advancing the science of delirium assessment. International Journal of Geriatric Psychiatry, 33(11), 1501-1511. <u>https://doi: 10.1002/gps.4711</u> U. S. Census Bureau. (2011). Age and sex composition: 2000 to 2010. Washington, DC: Government Printing Office. Retrieved from https://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf Van de Steeg, L., IJkema, R., Wagner, C. & Langelaan, M. (2015). The effect of an e-learning course on nursing staff's knowledge of delirium: A before-and-after study. British Medical Columbia Medical Education, 15(12), 1-8. https://doi.org/10.1186/s12909-015-0289-2 Weng, C. F., Lin, K. P., Lu, F. P., Chen, J. H., Wen, C. J., Peng, J. H., Tseng, A. H., & Chan, D. C. (2019). Effects of depression, dementia and delirium on activities of daily living in elderly patients after discharge. BioMed Central Geriatrics, 19(261), 1-8. https://doi.org/10.1186/s12877-019-1294-9 Wilson, J. E., Mart, M. F., Cunningham, C., Shehabi, Y., Girard, T. D., MacLullich, A. M., Slooter, A. J., & Ely, E. W. (2020). Delirium. Nature Reviews Disease Premiers, 6(90), 1-26. https://doi.org/10.1038/s41572-020-00223-4



## JOHNS HOPKINS SCHOOL of NURSING



### Aim 1: Enhancing nurse knowledge of early signs and symptoms of delirium • No statistically significant results found, likely due to fluctuations of sample size • Clinically-meaningful implications for nurse knowledge and recognition were noted

### Aim 2: Utilizing the 4AT instrument in hospitalized geriatric patients

• Clinically meaningful results for the improved utilization and frequency of 4AT

• Increases overall quality of care for hospitalized geriatric patients

• Is associated with improved outcomes and safety including mortality rates, lengths of stays, institutionalizations, and risk of long-term morbidities

• Reduces financial burdens placed on organizations

• Sustainable for long-term implementation, since this intervention aligns with the organization's goals and is financially feasible

• General lack of nurse awareness about the importance of delirium recognition • Lack of participation due to COVID-19 pandemic