

Delirium: A Practical Prevention Program

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Considering the impact of the financial cost and high-risk rate of delirium in elderly patients, the authors developed and implemented a program that identifies veterans at risk for delirium, modifies those risk factors, and monitors patients.

Mr. W., an 82-year-old veteran with coronary artery disease, dementia, hypertension, hyperlipidemia, and recurrent falls, has been living alone since his wife passed away. He needs increasing social and medical support. He receives assistance with cleaning, shopping, and cooking. The VA Home-Based Primary Care team supports his medication management. His daughter calls him daily to check in.

One evening Mr. W. forgot to remove his reading glasses and fell. Despite intense pain in his hip, he managed to call his daughter who drove him to the local hospital. In the emergency department (ED), he was found to have a hip fracture and was admitted for operative repair. While waiting for a hospital bed, Mr. W. was placed in the hallway, where the ED staff regularly checked his pain level. At 4 AM, he was brought to his room, after a 1-hour admission process. As Mr. W. dozed off, he was awoken during his vital signs.

DELIRIUM

Delirium is an acute change in mental status. In addition to the critical feature of rapid development (hours

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to days), the key cognitive deficit is inattention. Attention is the ability to focus cognitive processes over a period of time. Disturbance of consciousness, which reduces the ability to focus on a conversation, task, or command, is another important feature of delirium.

Mr. W. was able to focus attention during the initial stages of his admission, and subsequent monitoring may have detected changes rapidly. Patients admitted with a change in cognition should be evaluated for delirium.

Delirium occurs in up to 25% of patients on medical wards, 50% of postoperative patients, and 80% of intensive care unit (ICU) patients.¹⁻³ In his circumstance, Mr. W.'s risk is elevated due to his age (> 80 years), comorbidities, hip fracture, functional limitations, and sensory deficits. Once delirium occurs, it is associated with a mortality rate similar to a myocardial infarction or sepsis.⁴ Though reversible, patients who develop delirium are at increased risk for long-term consequences, such as

functional decline or residual cognitive impairment; both can lead to long-term care placement.⁵ Thus, delirium may have significant costs on patients' functional abilities.

Delirium is also costly for the health care system. Patients who develop delirium are estimated to accrue an additional \$16,000 to \$64,000 in medical expenses over the subsequent year, resulting in annual delirium-attributed costs of \$143 to \$152 billion.⁶ With high costs to patients and systems, the investment in delirium prevention programs, education, and research becomes critical.⁷

Prevention strategies have been shown to reduce delirium development and associated complications.⁸ Therefore, identifying at-risk patients on hospital admission and implementing prevention strategies may have long-term health and cost implications. The VA New England/Boston Geriatric Research, Education and Clinical Center (GRECC) developed and implemented a clinical demonstration project titled Delirium Toolbox. This project evolved from a VA

The VA's Geriatric Research, Education and Clinical Centers (GRECCs) are designed for the advancement and integration of research, education, and clinical achievements in geriatrics and gerontology throughout the VA health care system. Each GRECC focuses on particular aspects of the care of aging veterans and is at the forefront of geriatric research and clinical care. For more information on the GRECC program, visit the website (<http://www1.va.gov/grecc/>). This column, which is contributed by GRECC staff members, is coordinated and edited by Kenneth Shay, DDS, MS, director of geriatric programs for the VA Office of Geriatrics and Extended Care, VA Central Office, Washington, DC. Please send suggestions for future columns to Kenneth.Shay@va.gov.



Boston Healthcare System (VABHS) Healthcare Failure Effects-Modes Analysis (HFEMA) and the VABHS Delirium Task Force. The Delirium Toolbox is funded via a T21 mechanism administered by the Office of Geriatrics and Extended Care to prevent long-term institutionalization of high-risk veterans. This prevention program aims to (a) identify veterans at risk for delirium; (b) modify risk factors; and (c) monitor patients longitudinally for delirium. The implementation of intervention and monitoring strategies has required substantial investment and culture change by the acute care nursing staff at the VABHS West Roxbury campus. The enthusiasm and pursuit of delirium knowledge exemplified by the nursing staff has been the key to the successful adoption of the Delirium Toolbox.

IDENTIFYING RISK FACTORS

Delirium is a multifactorial condition, resulting from an interaction of patient and hospital system factors. Patient factors are characteristics or conditions that increase susceptibility to delirium. System factors are processes within the hospital that can induce delirium.

Patient Factors

A recent meta-analysis of delirium risk identified 6 independent risk factors for delirium: cognitive impairment, age, fracture, infection, severe illness, and sensory deficits.⁹ Across studies, poor cognitive performance is the most consistent independent risk factor for developing delirium.^{10,11} Poor cognitive performance can be found in patients with conditions such as dementia as well as those who have undetected memory or executive functioning deficits. Delirium preferentially occurs in older patients. The frequency of

older patients developing delirium in the hospital setting is 20% to 40%; significantly higher than the 25% occurrence in the general hospital population.⁹ Hip fracture is another strong independent risk factor, and evidence links any fracture on admission as an added vulnerability. Severe illness as measured by physiologic, electrolyte, or metabolic abnormalities is also a risk factor. Furthermore, vision and hearing impairment may jeopardize a patient's ability to process information, and these have been independently associated with delirium.⁹

System Factors

Unfortunately, there are factors inherent in the current medical system that may precipitate delirium. Such factors include sleep deprivation, restraints (physical and chemical), dehydration, malnutrition, hospital-acquired complications, and inappropriate or new medications.⁹ It is especially important to consider the medications that may adversely affect elderly patients, such as anticholinergics or benzodiazepines, which may have negative cognitive effects. The Beers List of potentially inappropriate medications is used by health care professionals for medication safety with older adults.¹² With a rising number of patient risk factors, reducing system factors is vital to diminish the onset of delirium.

THE DELIRIUM TOOLBOX

At the VABHS GRECC, the Delirium Toolbox project simultaneously identifies and modifies delirium risk. Monday through Friday, a team member of the GRECC Delirium Toolbox reviews older veterans' admission notes for risk factors. This brief chart review captures most of the major risk factors for delirium: age, prior cognitive impairment, se-

vere illness (intensive care admission), fracture, and infection. Team members interview patients aged ≥ 60 years who are identified as at risk due to any number of factors mentioned earlier to assess consciousness, attention, and sensory deficits. Risk level is communicated to nurses and providers informally through direct contact and formally through the electronic medical record notes of the computerized patient record system.

The interview consists of 4 assessments: (a) consciousness, using the modified Richmond Agitation and Sedation Scale (mRASS); (b) attention, using days of the week and months of the year backward; (c) cognitive performance by means of the Clock-in-the-Box (CIB); and (d) sensory deficits observed during the interview. Attention assessments monitor for a cognitive deficit of inattention; one of the key features of delirium.^{1,13} The CIB is a simple clock-drawing task associated with cognitive or functional deficits. The CIB should not be used as a solitary measure to identify cognitive deficits but used as a brief screening instrument. Visual and auditory deficits are assessed by patient report and throughout the interview.

MODIFYING DELIRIUM RISK

The next step is to implement non-pharmacologic prevention tools for early and effective intervention. Each medical and surgical ward and ICU is equipped with a Delirium Toolbox consisting of simple items to improve cognitive stimulation (playing cards, word search, crossword, and jigsaw puzzles); sensory input (hearing amplifiers, glasses); and sleep (earplugs, eye masks). These items are distributed to patients at the discretion of the Delirium Toolbox team and nursing staff. Delirium Toolbox

team members also offer formal servicing to wards and suggestions for nonpharmacologic interventions, such as reorientation, sleep promotion, and early ambulation and mobilization. After providing suitable interventions, a crucial next step for the Delirium Toolbox team member is to alert providers to patient's risk level and encourage them to monitor consciousness levels.

MONITORING FOR DELIRIUM

Despite critical prevention strategies, patients may still develop delirium. In such cases, early recognition and medical treatment of underlying causes are critical. Routine monitoring of at-risk patients provides the opportunity to identify delirium earlier. The Delirium Toolbox team recommends medical and surgical wards use the mRASS to measure consciousness and incorporate it into routine care with nursing reassessment notes.¹ ICU wards are advised to use the RASS that is specifically geared toward an ICU population.¹⁴ This 15-second assessment is highly sensitive to changes in consciousness, indicative of delirium. One study found a change in the mRASS to be sensitive (85%) and specific (92%) for delirium.¹ Consistent use of the mRASS may provide earlier recognition of change in consciousness and prompt further evaluation for delirium. The goal once delirium has occurred is to manage symptoms and resolve delirium as soon as possible while avoiding restraint use.

CONCLUSION

Mr. W. is at considerable risk for delirium based on his age, comorbidities, and hip fracture. On meeting him, the Delirium Toolbox team observed that he did not have his glasses and had a difficult time hearing. The veteran was provided the

correct-strength reading glasses and a portable hearing amplifier to improve sensory deficits. Additionally, the nurse made a phone call to his daughter and wrote her number in large print near the phone. The nurse also grouped the veteran's morning procedures to preserve his rest in the evening. In the afternoon, she provided some cognitive activities and additional interaction. She also communicated the patient's delirium risk level to his medical team who reevaluated his medications, controlled his pain, and consulted geriatrics. This interdisciplinary approach assisted the veteran through a safe hospital course, potentially helping to prevent delirium and support his return to independent functioning at home. ●

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