



Delirium Education in Hospice Care

A Quality Improvement Project

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Diagnosing delirium in hospice patients is challenging owing to the multifactorial causes and symptoms of delirium that can mimic natural end-of-life processes. When delirium goes unrecognized in hospice patients, preventable causes can be left untreated, leading to sequelae that are misaligned with the principles of hospice care. We conducted an evidence-based quality improvement project on a 10-bed inpatient hospice unit aimed at increasing nursing staff knowledge about assessing delirium, with a focus on preventable causes. Nurses were trained in use of the Nursing Delirium Screening Scale, which was implemented over a 5-week period. Increases in knowledge were evaluated with a pretest and posttest. We used a paired *t* test to determine knowledge improvement. Use of the tool was evaluated using a survey. Nurses demonstrated significantly improved knowledge after the educational session ($P = .009$). Survey results indicated overwhelmingly that nurses valued having an easy-to-use tool to assess delirium in their patients. Because we used a paper-based tool during the project, which was found to be cumbersome by staff, our next steps are to determine the feasibility of implementing the tool into the electronic medical record.

KEY WORDS

hospice nursing, delirium assessment, end of life, quality improvement

Delirium is a neuropsychiatric condition that manifests as acute and fluctuating changes to a patient's awareness, attention, cognition, and/or perception, often occurring at the end of life for 85% to 88% of patients with advanced illness and terminal cancer.¹ Within hospice and palliative care nursing, the perspective on delirium is shifting from delirium as an inevitable part of the

dying process to viewing it as a syndrome that needs to be identified and evaluated.² Diagnosing delirium is complex, because it can manifest in multiple ways, including a restless, agitated state (hyperactive), a lethargic, noncommunicative state (hypoactive), or a combination of both hyperactive and hypoactive.^{3,4} Although a high prevalence of delirium exists during end of life, the recognition and diagnosis of delirium are grossly underrecognized by the health care team, which is likely related to associated diagnostic challenges.⁵ When delirium is not recognized and treated appropriately, it can lead to increased likelihood of falling, emotional distress, anxiety, depression, as well as posttraumatic stress disorder for family members, who may experience less time spent with loved ones at the end of life.⁶

Delirium in hospice patients can be due to preventable causes, which may be amenable to intervention. Although patients may experience delirium related to age, dementia, and other comorbidities, at the end of life, delirium can develop from medications, constipation, urinary retention, and changes in the sleep-wake cycle.^{7,8} Evidence suggests a number of noninvasive interventions that may help prevent episodes of delirium, including maintenance of a healthy sleep-wake cycle of normal daytime and nighttime activities, use of hearing aids and glasses, exposure to light during the day, and maintaining a dark and quiet environment at night.⁹

In the inpatient hospice setting, hospice nurses, who spend more time at the bedside than other disciplines, are the ideal caregivers to routinely assess, treat, and prevent delirium, to ensure that the goals of quality end of life are achieved.¹⁰ Sequelae of undiagnosed delirium are misaligned with the principles of hospice care, which are to provide patient-centered/determined symptom management to maintain comfort at the end of life.¹¹ However, hospice nurses have expressed inadequate knowledge of delirium and its treatment, including difficulty recognizing delirium.¹² Researchers have found that hospice nurses can readily utilize standardized assessment tools to routinely assess for and recognize delirium; still, these tools are underutilized in hospice care.^{5,13}

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Local Problem

The Center for Acute Hospice Care (referred to herein as *The Center*) is a 10-bed inpatient unit within Hospice of



the Piedmont, a community-based, nonprofit hospice organization located in Central Virginia. The purpose of The Center is to serve as a transitional unit that provides 24-hour general inpatient nursing care to adult hospice patients with acute symptoms who are unable to be managed at home. Patients are typically admitted to The Center both directly from the hospital and from the home (for those already established as hospice patients) for management of uncontrolled symptoms. To be admitted, patients must meet the hospice requirement of a 6-month or less prognosis and have a do-not-resuscitate order. Of the patients admitted from the home setting, about 95% are admitted for unmanaged symptoms of agitation and restlessness.

The Center employs 9 full-time and 2 per diem staff nurses who work 12-hour shifts; the nurse-to-patient ratio is typically 1 nurse for every 4 to 5 inpatients. Nurses provide most of the care for the patient population. In the 3 years leading up to this project, a registered nurse working on the unit (also a coauthor of this article and the project leader) noted that there were a high number of patients being admitted with delirium who had addressable issues that were later determined to be responsible for the delirium that led to their admission. At initial admission, however, certain precipitating factors that can contribute to the onset of delirium were not consistently recognized by the care team, leading to delays in appropriate care. The project leader initiated a root cause analysis among the nursing staff to identify reasons for lack of appropriate delirium assessment and recognition. Nurses identified that, although they had some knowledge of delirium, they lacked comprehensive education about how to recognize the condition. The Center lacked standardized delirium

assessment policies and did not use a delirium assessment tool. Nursing staff supported the implementation of adoption of standardized procedures and an assessment tool in an effort to improve timely recognition and treatment of delirium. Thus, we sought evidence-based information to guide improved recognition of delirium, with a focus on identifying preventable causes.

The Nursing Delirium Screening Scale Assessment Tool

There are numerous delirium assessment tools that may be used for accurate delirium screening, diagnosis, and determination of its severity. The Confusion Assessment Method (CAM) is the most studied and has the strongest psychometric properties,^{14,15} but it may not be the most appropriate for a busy clinical environment. The CAM requires extensive clinical training, is both observational and interactive, is typically combined with an additional cognitive test such as the Mini-Cog, and requires about 10 minutes to complete.¹⁴ By contrast, the Nursing Delirium Screening Scale (Nu-DESC) Assessment Tool is a quick, easy-to-use, observational tool developed by nurses to be used on busy inpatient units (Figure 1).^{15,16} The assessment tool is derived from the Confusion Rating Scale (CRS), a 4-item scale that composes the first 4 elements of the Nu-DESC; this is supplemented with an additional item to rate psychomotor retardation, an assessment of delayed or lack of responsiveness that can be seen in hypoactive delirium. Thus, the Nu-DESC is a 5-item tool that evaluates a patient's disorientation, inappropriate behavior, inappropriate communication, illusions and hallucinations, and psychomotor retardation.¹⁶ Users score each of the 5 items on a 3-point rating scale

Features and descriptions		Symptoms Rating (0-2)		
Symptom	Time Period	Midnight - 8 AM	8 AM - 4 PM	4 PM - Midnight
I. Disorientation Verbal or behavioural manifestation of not being oriented to time or place or misperceiving persons in the environment				
II. Inappropriate behaviour Behaviour inappropriate to place and/or for the person; e.g., pulling at tubes or dressings, attempting to get out of bed when that is contraindicated, and the like.				
III. Inappropriate communication Communication inappropriate to place and/or for the person; e.g., incoherence, noncommunicativeness, nonsensical or unintelligible speech.				
IV. Illusions/Hallucinations Seeing or hearing things that are not there; distortions of visual objects.				
V. Psychomotor retardation Delayed responsiveness, few or no spontaneous actions/words; e.g., when the patient is prodded, reaction is deferred and/or the patient is unarousable.				
Total score				

FIGURE 1. The Nursing Delirium Screening Scale. Reproduced from *J Pain Symptom Manage.* 2005;29(4):368-375, with permission from Elsevier, license number 4947160436366.



(0–2), with 0 representing no symptom or behavior suggestive of delirium and scores of 1 or 2 representing increasing levels of each evaluated symptom or behavior. Total scores range from 0 to 10. Importantly, the tool can be conducted in 1 minute, a critical consideration for a busy hospice care team.¹⁶

Although the Nu-DESC has not been studied as extensively as the CAM, it has performed well in psychometric testing and is recommended for clinical environments owing to its accuracy coupled with the ease and speed of use.^{14,15} Gaudreau and colleagues evaluated its validity against the CAM, the *Diagnostic and Statistical Manual (DSM-IV)*, the Memorial Delirium Assessment Scale (MDAS), and the CRS. They determined that relative to the CAM, it has an efficiency ranging from 79.9% (CRS) to 86.4%, better than the CRS (79.7%), and slightly less than the *DSM-IV* (96.6%) and the MDAS (91.5%). The sensitivity and specificity of the Nu-DESC are 85.7% and 86.8% respectively, also comparable those of the MDAS and *DSM-IV*.¹⁶ More recent studies have shown a sensitivity ranging from 46% to 100% (96% when using a cutoff point of >0) and a sensitivity of 90% to 95%.¹⁵ Furthermore, the Nu-DESC has been shown to be far more sensitive in detecting delirium than a shortened version of the CAM as well as a very high adherence rate, suggesting that use of a feasible routine assessment tool can impact nursing practice.¹⁴

Inpatient Hospice Delirium Education

Delirium education for nurses in an inpatient setting should encompass a complex array of practice issues including understanding the definition of delirium, its prevalence and adverse effects, risk factors for and precipitating factors of delirium, varying symptom manifestation by subtype, assessment skills and tools, management of reversible causes, nonpharmacological treatments, pharmacological treatments, and prevention. Delirium, defined as an acute change in a patient's cognition, can manifest in a variety of ways with each subtype characterized by their symptoms.^{1,4} Those with hyperactive delirium are more likely to experience restlessness and agitation, whereas those with lethargy and somnolence are characterized as hypoactive, and a combination of both types of symptoms, classified as mixed subtype, can occur.^{3,4} Multiple adverse effects can occur, including anxiety, fear, depression, and loss of time spent with loved ones, which can affect the patient, family/caregivers, and health care workers.^{4,5} Because of these negative impacts, early recognition and accurate diagnosis are imperative, particularly as many causes of delirium can be prevented, reversed, and treated.^{5,12} Risk factors for delirium include older age; history of dementia; functional, visual, or auditory impairment; and having a high comorbidity burden.⁸ In those at risk, a variety of factors can lead to delirium: polypharmacy (particularly related to psychoactive medications), pain, dyspnea, infection, urinary retention, constipation, and physical restraints.^{5,8} Given the complexity, recognizing the onset and

occurrence of delirium requires monitoring for acute and fluctuating changes in a patient's cognition, attention, disorganized thinking, and changes in the patient's level of consciousness.^{3,8} Additional supportive criteria may include disturbed sleep-wake cycle, inappropriate behavior, and perceptual disturbances such as delusions, illusions, or hallucinations.⁸ Delirium may be attributed to reversible causes including constipation, hypovolemia, infection, medications, bladder obstruction or presence of a urinary catheter, oxygen deficit (CHIMBOP).⁵ Assessment for CHIMBOP may be aided by eliciting information from the family.^{5,8}

The primary goal of delirium management is to ensure patient safety; those with hyperactive delirium are at increased risk of hurting themselves.⁷ Nonpharmacological treatments are considered the first-line approach and may include adjusting medication, managing symptoms of pain and dyspnea, normalizing the sleep-wake cycle, rectifying sensory deficits, and treating infections.^{7,8} If nonpharmacological methods are ineffective and safety is an issue, antipsychotics, such as haloperidol and olanzapine, have been used to reduce agitation and thus improve safety, although studies have not shown consistent positive effectiveness.^{7,8} As such, those caring for patients with delirium may find that maintaining a sense of normal daily routine as much as possible can improve delirium. These strategies include promoting wakefulness during the day: letting sunlight into the room during the day, ensuring that all sensory assistive devices are in place including eye glasses and hearing aids, facilitating family participation and access to a calendar and clock to provide reorientation for the patient, and promoting nighttime sleep by turning off lights at night and minimizing sleep interruption.^{8,9}

Harrison and colleagues reported an inpatient hospice quality improvement project in which they supplemented their implementation of a standardized delirium tool (the CAM) along with a screening tool used to assess for preventable and reversible causes of delirium. Their study demonstrated that inpatient hospice nurses can successfully implement a routine delirium assessment tool and a screening tool for preventable/reversible causes of delirium.⁵

Project Purpose

Given the relative strength of the Nu-DESC for implementation in a busy inpatient unit, we opted to implement the Nu-DESC tool, supplemented by an educational intervention that incorporated prevention, assessment, and treatment strategies, and an overview of CHIMBOP screening for preventable and reversible causes of delirium. Thus, the purpose of this evidence-based quality improvement project was to evaluate the impact of our intervention on the ability of our nursing staff to improve their delirium knowledge and skills on our 10-bed inpatient hospice unit.



METHODS

Intervention

We conducted a 2-part intervention that included a delirium educational session followed by implementation of the Nu-DESC screening tool. The educational content was drawn from the evidence-based literature as described in Inpatient Hospice Delirium Education, above.

Heinrich and colleagues^{14,17} have published a modified version of the original Nu-DESC tool that supplements the scores with an explanation of each. Although we used the original tool for patient assessments,¹⁶ we used the modified version to enhance explanation of the tool during the educational sessions. All content was delivered in a 1-hour slide presentation, which was offered at 6 different times to accommodate nursing staff schedules.

The educational session was offered to all staff members of the interdisciplinary team and delivered by the project leader. A paper copy of the slide presentation, the reversible causes screening tool,⁵ the modified version of the Nu-DESC tool,¹⁴ and all other references used in our study were available at the nurses' station to supplement implementation of the intervention.

The Nu-DESC protocol was implemented as the educational sessions began to be offered and continued for 5 weeks. During the 5-week period, a staff nurse performed a Nu-DESC assessment on all noncomatose patients 1 time during each 12-hour shift.

Because the project was quality improvement, institutional review board review and oversight were not required. A letter of permission to conduct the study was obtained from the Hospice of the Piedmont organization's chief clinical officer and the clinical services manager of The Center.

Measures

To determine improvement in delirium knowledge, all staff nurses who participated in the educational session were asked to complete an author-designed 12-question test before and then immediately after the session. Test content was derived directly from the evidence-based delirium literature taught during the educational session (see "Intervention" section). Questions with correct answers identified are presented in Figure 2. The test had a total of 26 correct answers, owing to multiple questions having more than 1 correct answer. Total scores for both tests were calculated by the number of correct answers out of the 26 possible. Changes in scores were compared using a paired *t* test to determine significant improvement in knowledge. Level of significance was set at $\alpha \leq 0.05$.

A "Practicality Survey" was developed by the project leader, designed to evaluate staff nurses' perspectives on using the Nu-DESC assessment tool, such that future changes could be guided from these data. The survey

was based on the Ease-of-Use survey used by Harrison and colleagues⁵ in their quality improvement study evaluating implementation of a CAM-based protocol with inpatient hospice nurses. Our 9-question survey used a Likert scale design to evaluate postintervention perceptions of the understandability, satisfaction with, and usability of the Nu-DESC tool, as well as of the training that had been provided. Survey data were analyzed descriptively. The survey questions are presented in the Table, along with the results (which are explained in the "Results" section). All statistics were conducted using IBM SPSS, v24 (Redlands, California).

RESULTS

Ten staff nurses (9 full-time and 1 per diem; 8 registered nurses and 2 licensed practical nurses), 1 nursing assistant, the clinical services manager, the attending physician, and the unit nurse practitioner all participated in the educational session. All 10 nurses completed the pretest and posttest bookending the educational session. There was a significant difference between the pretest and posttest scores (16.4 vs 21.2; $P = .009$). During the 5-week intervention period, 11 of the 23 noncomatose patients assessed with the Nu-DESC were recognized as having delirium.

Eight staff nurses completed the Practicality Survey. One hundred percent of the nurses understood the Nu-DESC tool, felt it was easy to use, and felt sufficiently trained and confident to use it. Seventy-five percent felt the tool helped them recognize delirium and considered that the tool gave them a valuable skill. Full survey results are in the Table.

Although qualitative data were not formally collected, nurses shared both positive and negative comments with the project leader. During tool implementation, several nurses commented that the paper form of the assessment tool was cumbersome and burdensome, particularly in conjunction with the 5-week evaluation period. During the educational sessions, nurses reported appreciation for learning more about delirium and having a better understanding of how to prevent delirium and suggested that their other colleagues, particularly those in the home care setting, should receive the same information. Another concern raised by nurses was the overlap between the symptoms of hypoactive delirium and the end-of-life process. They noted that both states included increased lethargy, somnolence, and withdrawal. The project leader provided supplemental evidence-based information to guide nurses in the differences, specifically that a hallmark of delirium is typically an acute, rather than insidious, change in cognition.^{5,13}

DISCUSSION

During this quality improvement project, nurses on our 10-bed inpatient hospice unit responded positively to the



1. Why is it important to learn about delirium?

Delirium...

- a. allows patients to spend quality time with their loved ones
- b. occurs at a high prevalence rate at end of life**
- c. is a negative experience with increased incidence of PTSD, depression, and anxiety**
- d. is preventable, reversible, and treatable**

2. The definition of delirium includes which of the following

- a. acute and fluctuating changes**
- b. constipation
- c. changes in attention and cognition**
- d. all of the above

3. Which of the following are components of delirium?

- a. acute changes**
- b. alert
- c. inattention**
- d. disorganized thinking**

4. Symptoms of the subtype hypoactive delirium include;

- a. slow in responding to questions**
- b. agitated
- c. lethargic**
- d. all of the above

5. Some risk factors that make some vulnerable to developing delirium include which of the following;

- a. age greater than 75**
- b. visual/hearing/functional impairment**
- c. ambulating with a walker
- d. sleeping well

6. Some precipitating factors that may cause delirium to develop include which of the following;

- a. normal regular bowel movements
- b. infection**
- c. polypharmacy**
- d. pain/dyspnea**

7. Some reversible causes of delirium include which of the following:

- a. age
- b. medications**
- c. sleep deprivation**
- d. all of the above

8. Pharmacological methods of treatment is the first line approach to treating delirium?

- a. True
- b. False**

9. Benzodiazepines are proven to effectively treat delirium?

- a. True
- b. False**

10. What is NuDESC?

- a. is an assessment tool for delirium**
- b. stands for Nursing Delirium Screening Scale**
- c. quickly done in one minute per patient**
- d. can only be done by a psychiatrist
- e. all of the above

11. How is delirium managed?

- a. ensure patient's safety
- b. identify cause
- c. treat reversible causes
- d. manage symptoms
- e. all of the above**

12. Prevention can include which of the following strategies:

- a. shades closed, lights off at night to promote sleep**
- b. introduce yourself and orient patient to surroundings and location**
- c. ensure that patient stays in bed with blinds closed during the day
- d. provide patient with glasses and hearing aids as needed**

Note: Correct answers are indicated in bold.

FIGURE 2. Author-designed 12-question knowledge survey administered to participants before and after a 1-hour hospice-specific delirium educational session.

implementation of the Nu-DESC tool. Data showed that their knowledge of delirium improved after the hour-long educational intervention. Implementation of the Nu-DESC tool for a 5-week period allowed the staff to use their new knowledge in practice during their working hours. The Practicality Survey results demonstrated that nurses valued having access to an easy-to-understand tool that improved their ability to assess and recognize delirium.

Other than staff time, no extra resources were needed to implement the project. However, the staff found completing the assessment on paper to be burdensome. Moving forward, our goal is to integrate the assessment tool into our electronic medical record, so that delirium assessment can easily be performed routinely on every patient. Nurses in our intervention noted confusion between the delirium symptoms and end of life. When implementing the Nu-DESC tool, this potential area of confusion should be anticipated and integrated into the educational session. As is

often necessary on a 24-hour unit, the educational sessions were conducted during work hours. This may have led to nurses experiencing more difficulty learning, when no coverage is provided for patient care, which may lead to nurses leaving the educational intervention to attend to patient needs. This is likely a reality that many inpatient units face and reemphasizes the need for ongoing education, rather than a 1-time educational session.

Limitations

This was a quality improvement project conducted on 1 unit. Thus, results are intended to be instructive and not intended to be generalizable outside this unit. Although our sample size was small, we were able to demonstrate significant improvement in nursing staff knowledge, suggesting that our nursing staff can improve delirium recognition and assessment in our patients with a relatively brief focused session.



TABLE Practicality Survey Results (n = 8)

	Strongly Disagree		Disagree		Neither Agree Nor Disagree		Agree		Strongly Agree	
	n	%	n	%	n	%	n	%	n	%
I understand the concepts of the tool							4	50	4	50
I understand the language used with the tool							4	50	4	50
I have sufficient knowledge from my training to use the tool efficiently							5	63	3	38
I feel confident in using these tools							6	75	2	25
I feel the tool was quick and easy to use							4	50	4	50
I needed extra help to use the tool	1	13	5	63			2	25		
I feel the available materials were helpful							7	88	1	13
I feel the tool was helpful in recognizing delirium					2	25	4	50	2	25
I feel the tool is a valuable addition to my nursing assessment skills					2	25	4	50	2	25

The total percentage across rows may be greater than 100% because of rounding.

We learned a few lessons for improving this work that may be useful to other nurses attempting this type of project. First, although we determined how many patients were identified with delirium over the 5-week period, in future studies, it would be useful to also determine the increase in nurses' ability to recognize delirium, as well as changes to any resultant nursing interventions. In conjunction with this, it may be helpful to collect demographic data on the staff who are using the Nu-DESC to determine if there is any correlation between successful use of the Nu-DESC and staff years of experience, type of nursing license, or years working in the hospice setting. Second, nurses were the only members of the interdisciplinary team to take part in our project. However, given how many other team members spend time with patients, future iterations of this project should include other team members. On our unit, nursing assistants spend considerable time with our patients and would benefit from this education. We also did not include home care nurses, which was suggested by the nurses who participated in the intervention. Broader dissemination of the tool is consistent with our organization's aim to maintain consistent care across all settings.

Conclusion

This quality improvement project highlights a successful method for educating and improving inpatient hospice

nurses' knowledge in delirium and implementation of the Nu-DESC tool. Ultimately, a routine assessment established into the EHR can help systematically monitor for the presence of delirium. Systematic evaluation using the Nu-DESC tool has the potential to improve patient safety and provide data to support patient-centered and patient-determined goals of care. Future work should include collection of patient and nurse data to better understand factors related to the improvement of delirium detection, in efforts to continually improve hospice nurses' care of patients at the end of life.

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