Published in final edited form as:

J Gerontol Nurs. 2012 January ; 38(1): 32–42. doi:10.3928/00989134-20110706-01.

Delirium Superimposed on Dementia:

Accuracy of Nurse Documentation

Melinda R. Steis, PhD, RN[Health Services Research and Development (HSR&D) Postdoctoral Research Fellow] and

Department of Veterans Affairs Medical Center, Tampa, Florida

Donna M. Fick, PhD, RN, FAAN[Professor of Nursing, School of Nursing, and Professor of Medicine]

Department of Psychiatry, The Pennsylvania State University, University Park, Pennsylvania

Abstract

Delirium is an acute, fluctuating confusional state that results in poor outcomes for older adults. Dementia causes a more convoluted course when coexisting with delirium. This study examined 128 days of documentation to describe what nurses document when caring for patients with dementia who experience delirium. Nurses did not document that they recognized delirium. Common descriptive terms included words and phrases indicating fluctuating mental status, lethargy, confusion, negative behavior, delusions, and restlessness. Delirium is a medical emergency. Nurses are in need of education coupled with clinical and decisional support to facilitate recognition and treatment of underlying causes of delirium in individuals with dementia.

Delirium is an acute, fluctuating confusional state that is treatable and potentially preventable when recognized early. In older adults, delirium results in increased risk for poor health outcomes, including complications during hospitalization, increased lengths of stay, nursing home placement, and death (Marcantonio, Ta, Duthie, & Resnick, 2002; McAvay et al., 2006; Pitkala, Laurila, Strandberg, & Tilvis, 2005). Individuals with dementia who experience delirium are twice as likely to die within 1 year (Bellelli, Speciale, Barisione, & Trabucchi, 2007). The economics of this problem are compelling. The annual costs of caring for hospitalized older adults with delirium are conservatively estimated at \$38 billion, twice as high as caring for older adults who do not experience delirium (Leslie, Marcantonio, Zhang, Leo-Summers, & Inouye, 2008).

Dementia is the leading risk factor for individuals to develop delirium and causes a more convoluted course when coexisting with delirium (Fick, Kolanowski, Waller, & Inouye, 2005). In older medical inpatients, 59% of those with dementia developed delirium, whereas only 13% of those without preexisting dementia developed delirium (Margiotta, Bianchetti, Ranieri, & Trabucchi, 2006). Over time, individuals with delirium superimposed on dementia (DSD) experience delayed responses to verbal stimuli and more restlessness, agitation, delusions, anxiety, aggressive behavior, and hallucinations, as well as a more fluctuating course than patients with delirium alone. Laurila, Pitkala, Strandberg, and Tilvis (2004) studied acute illness onset in a group of patients with and without dementia in acute and longterm care facilities; those with dementia who became acutely ill were more likely to

Copyright © SLACK Incorporated

Address correspondence to Melinda R. Steis, PhD, RN, HSR&D Postdoctoral Research Fellow, Department of Veterans Affairs Medical Center, 8900 Grand Oak Circle, Tampa, FL 33637; Melinda.Steis@va.gov.

The authors disclose that they have no significant financial interests in any product or class of products discussed directly or indirectly in this activity.

develop a swift decline in cognition and a more direct path to delirium than those patients without dementia. In summary, evidence shows that individuals with DSD are vulnerable and at higher risk for poor outcomes.

Delirium is difficult to recognize, as it has multiple components: (a) acute onset; (b) fluctuation during the course of the day; (c) inattention or decreased ability to focus, sustain, or shift attention; (d) change in cognition or development of a perceptual disturbance; (e) disturbance of consciousness; and (f) evidence that the disturbance is directly caused by the effects of a medical condition (American Psychiatric Association [APA], 2000).

Recognition of delirium necessitates multiple assessment techniques to detect the multiple components of delirium. In addition, delirium and dementia have overlapping symptoms (see Care for Elders Education Group, n.d., for a detailed comparison). Nurses may have difficulty differentiating the declining cognitive impairment of dementia from the acute confusional state of delirium. Fick, Hodo, Lawrence, and Inouye (2007) reported that nurses had similar difficulties when presented with case vignettes describing dementia and delirium. In the acute care setting, health care professionals are not always aware of or familiar with patients' baseline mental status. Speed, Wynaden, McGowan, Hare, and Landsborough (2007) reported similar difficulties when exploring delirium prevalence in two Australian hospitals. Health care professionals' ability to identify delirium on admission to acute care was impeded by the presence of complex comorbid conditions such as dementia, depression, and medication side effects.

The delirium recognition process is further complicated when various terms are used to indicate delirium is present (e.g., *intensive care unit psychosis*, *acute mental status change*, *postoperative psychosis*). Labeling delirium facilitates the implementation of appropriate care measures, but the label *delirium* is a medical diagnosis. Nurses may not be comfortable deriving medical diagnoses from their assessments. Until recently, delirium was labeled *acute confusion* in the nursing literature. The multiple terms can lead to problems communicating assessed findings as well as problems accessing published guidelines, as they are labeled *delirium guidelines*. Yet, nurses are in the best position to assess patients' fluctuating mental status—a critical component of delirium. Therefore, nurses are most capable of recognizing delirium through their assessments.

The difficulty nurses have in recognizing delirium (Fick et al., 2007; Inouye, Foreman, Mion, Katz, & Cooney, 2001; Milisen et al., 2002) and DSD (Fick & Foreman, 2000; Inouye et al., 2005) has been substantiated. The purpose of this study was to determine the accuracy of nurse documentation of DSD in patients who were determined by the researchers to have delirium in addition to dementia. This study addressed the following research questions:

- Did nurses document that their patients were experiencing delirium?
- What terms and phrases did nurses use to document mental status assessments findings?
- How did nurses document the delirium features?

METHOD

Design

The design of this study was retrospective descriptive. Data were initially used from a larger prospective study, "Delirium in Persons with Dementia" (see <http://clinicaltrials.gov>, trial NCT01394328). Next, an original electronic medical record (EMR) review ("chart audit") was conducted for these participants by the first author. The data used from the original

study (“study”) included daily Confusion Assessment Method (CAM) scores, as well as demographic data. The CAM (Inouye et al., 1990), a standardized test of delirium, was completed daily by trained research assistants on 138 participants during an acute care hospitalization. The research assistants also reviewed documentation, medication administration records, and laboratory test results. From these data, two comparison groups (DSD and no delirium [ND]) were created. The first author then conducted a retrospective chart audit of nurses’ documentation of mental status and related behaviors documented from midnight until 11:59 p.m. on a given day of delirium or no delirium.

Institutional Review Board approval was granted by the university and the host hospital. Protection of human subjects was further assured by blinding the researchers to the participants’ CAM scores and to the identity of the nurses.

Sample

The final sample consisted of 104 participants with dementia who were hospitalized for at least 2 days. There were two study groups: The DSD group consisted of 53 participants who experienced delirium on at least 1 hospitalized day; the ND group consisted of 51 participants who never experienced positive delirium while hospitalized. The process detailing the transition from the 138 participants in the study to the 104 participants in the chart audit is illustrated in the Figure. The study participants were inpatients at a 200-bed community hospital in central Pennsylvania.

Participant inclusion and exclusion criteria were established by the study. Inclusion criteria for the patient sample were English-speaking adults 65 and older with dementia who were admitted to a medical-surgical unit and had been hospitalized for 24 hours or less at the time of initial screening. Individuals were excluded from enrollment if they had any significant neurological or neurosurgical disease associated with cognitive impairment other than dementia, such as Parkinson’s disease, Huntington’s disease, normal-pressure hydrocephalus, seizure disorder, subdural hematoma, head trauma, or known structural brain abnormalities. Individuals were excluded if they were nonverbal, aphasic, intubated, terminal, or unable to communicate due to severe dementia. Individuals were also excluded from enrollment if there was no family or caregiver available or willing to be interviewed.

This study consisted of an aggregate group of nurses who cared for the patients in the hospital and were blinded to study aims. Although the nurses were not considered study participants, nurses’ documentation was analyzed. The identity of the nurses was coded immediately and was not retained; therefore, no identifying data were collected on the nurses. The data provided by the host hospital included number of nurses employed, educational level, age, use of agency and travel nurses, and number of nurses with specialty certifications (Table 1). The two study groups included 203 RNs and 38 licensed practical nurses who documented on the medical records.

Measures

Baseline Mental Status—Family members were interviewed at enrollment to ascertain the patients’ baseline mental status using the Modified Blessed Dementia Rating Scale (MBDRS, Blessed, Tomlinson, & Roth, 1968); Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE), short form (Jorm, 1994); Mini-Mental State Examination (MMSE, Folstein, Folstein, & McHugh, 1975); and Clinical Dementia Rating scale (CDR, Hughes, Berg, Danziger, Coben, & Martin, 1982). The participants may or may not have had a medical diagnosis of dementia documented in the medical record but were presumed to have dementia if they had a score greater than 3 on the MBDRS and 3.3 or greater on the IQCODE, as well as documented symptoms of dementia over at least a 6-month period. The

MBDRS and IQCODE were used to successfully screen for preexisting cognitive impairment in older adults in past research (Pisani, Inouye, McNicoll, & Redlich, 2003).

Dementia severity was determined using the CDR (Hughes et al., 1982). Possible scores range from 0 (*no dementia*) to 3 (*severe dementia*). The MMSE (Folstein et al., 1975) was used to examine intra-individual changes in participants' mental status over time in the study. MMSE scores range from 0 (*severe cognitive impairment*) to 30 (*no cognitive impairment*).

Confusion Assessment Method—The CAM is a validated instrument to screen for the diagnosis of delirium (Inouye et al., 1990), allowing individuals without formal psychiatric experience to be trained to accurately identify delirium. The CAM addresses four areas: (a) acute onset and fluctuating course, (b) inattention, (c) disorganized thinking, and (d) altered level of consciousness. A positive CAM score is indicative of an acute change in mental status from the patient's baseline, as well as fluctuation of the severity of the change, inattention, and either disorganized thinking or evidence of an altered level of consciousness. A negative CAM score (no delirium) indicates one or none of the above symptoms (Inouye et al., 1990). Participants were scored as having subsyndromal (partial) delirium if they exhibited any two features. Research assistants completed required research ethics training and training in the CAM and other instruments by self-study, didactic sessions, paired sessions of mock interviews with interrater assessment, and paired ratings of patients observed by a trained interviewer. The interrater agreement ratings were consistently 90% to 100% congruent.

Mental Status Terms and Phrase Extraction—The study hospital used MEDITECH's Patient Care System (MEDITECH, Westwood, MA), an EMR system, for all nurse documentation. Nurses' notes describing mental status and related behaviors were extracted by the principal investigator (PI, M.R.S.) while blinded to the delirium status for each 24-hour period of documentation, which was designated as part of the sample for both study groups. Specific words/phrases that described patients' mental status and related behaviors, such as description of orientation status, examples of disorganized thinking, or descriptors of verbalizations or behaviors indicative of changes, were extracted by the PI. After data extraction, the PI became aware of the source participants (DSD versus ND).

Defining Delirium Recognition in the EMR—The determination that nurses recognized delirium was made when either *delirium* or *acute confusion* was documented in the participants' medical record.

Data Analysis

Descriptive statistics were used to address whether nurses documented that patients experienced delirium. Then, content analysis was performed to compare the study CAM scores (delirium or no delirium) with the nurses' documentation describing the patients' mental status for the two study groups (DSD and ND) (Graneheim & Lundman, 2004). Categories of similar descriptive words/phrases were created, and then word/phrase counts from each of the categories were reported.

Three nurses independently mapped the extracted words/phrases describing patients' mental status and related behaviors to features of delirium as presented by the CAM since the CAM was the measure used to determine delirium or no delirium in the study (Table 2). The purpose of this analysis was to report which delirium symptoms the nurses documented and which they did not. A similar method was used by Voyer, Cole, McCusker, St-Jacques, and Laplante (2008). Each delirium feature was assigned a corresponding number (0 to 5).

To control for researcher bias and to ensure reliability of the analysis, the nurse mappers were RNs not linked to this study who had current clinical experience caring for older adults. Although the PI retained the data origination information, nurse mappers were blinded to the delirium status of the study participants and were sent an electronic file containing instructions, mapping criteria (Table 2), and a spreadsheet file with the list of words/phrases nurses used to describe their patients' mental status in this data set. The spreadsheet had a designated column for each nurse to enter the code indicating her expert opinion on to which feature of delirium the word/phrase should be mapped.

The results of the initial CAM mapping activity yielded 0.756 agreement using Cronbach's alpha coefficient. In an effort to improve the level of agreement, a nurse practitioner with 15 years of experience and dual board certification in geriatrics and psychiatry performed adjudication only on areas of disagreement (3.6% of total). The adjudicator was provided the mapping results from the three RN mappers as well as the CAM delirium criteria. Once completed, the PI reviewed and approved the final mapping exercise results. Logistic regression analysis with repeated measures was used to analyze the data and report the results of the mapping exercise.

RESULTS

Data were derived from 228 days (113 DSD group, 115 ND group) of nursing documentation. Specifically, extracted documentation data described patients' mental status and related behaviors. Characteristics of source patients are presented in Table 3. Overall, the sample characteristics indicated the participants in the DSD group were slightly older and exhibited more advanced dementia than the ND group, as evidenced by higher dementia severity scores on the CDR, MBDRS, and IQCODE. On average, the DSD group had a lower MMSE score (7.6) at admission and at discharge (9.6) from acute care than the ND group. Lastly, the mean length of stay was more than 2 days longer for the DSD group.

Research Questions

Did Nurses Document that Their Patients Were Experiencing Delirium? As evidenced by the absence of nurses' notations of the terms *delirium* or *acute confusion* in this data set, nurses did not document that their patients were experiencing delirium on days the researchers determined the patients had delirium.

What Terms and Phrases Did Nurses Use to Document Mental Status Assessments Findings? Nurses described mental status and related behaviors of the DSD group differently than and twice as often as they did for the ND group. The resultant categories of data are displayed in Table 4. Descriptive terms used more often for the DSD group included terms indicating fluctuating mental status, lethargy, confusion, negative behavior, delusions, and restlessness. The word *confusion* was documented twice as often in the DSD group. In fact, nurses' documentation of mental status in the DSD group was often satisfied by using the general term *confused* (e.g., "Patient remains pleasantly confused").

Although descriptions related to orientation were frequent in both groups, phrases indicating that patients were oriented, such as *alert and oriented*, were much more common in the ND group. Phrases describing disorientation by specifically documenting orientation to person, place, and/or time were more common in the DSD group (e.g., "Patient is alert to person only," "Patient confused to time/place/event"). Nurses commonly substituted *alert* for *oriented* (e.g., *awake and alert*, *alert to person*, *alert to name only*, *not alert to person*).

How Did Nurses Document the Delirium Features? Logistic regression of the terms mapped to delirium features did show significance in three areas: disorganized thinking, altered level

of consciousness, and that nurses in this study were likely to document at least one feature of delirium in patients who were determined to have delirium by the research assistants (Table 5). Two delirium features, fluctuating course and inattention, were documented but did not reach the level of significance. Nurses did not document terms or phrases to indicate an acute onset of mental status change in this data set. On occasion, nurses described features of hyper-/hypo-activity but did not refer to hyper-/hypoactive delirium.

DISCUSSION

In this study, nurses did not recognize delirium, or at least did not document that they recognized delirium. Compared with similar studies (Fick et al., 2007; Inouye et al., 2001; Voyer, Richard, Doucet, Danjou, & Carmichael, 2008), these results reveal the lowest rate of nurse recognition of delirium. This may be because nurse recognition of delirium was strictly defined. Other studies have made allowances for terms, assuming that nurses recognize delirium when related terms or single features of delirium were documented. For example, Friedman, Qin, Berkenstadt, and Katznelson (2008) reported an 18% rate of nurse recognition of delirium by accepting *confused* and *delirium* as evidence of recognition. *Confused* is a term that nurses use frequently but do not consistently define (Milisen et al., 2002). In addition, it was unclear whether nurses using this term were associating confusion with dementia or delirium. For example, nurses documented *confused* more often in the DSD group than in the ND group, but there was no indication that the nurses' use of the term *confusion* communicated that the patient was experiencing delirium. Notably, disorganized thinking, altered level of consciousness, and—to a lesser degree—fluctuation in mental status, were documented. However, other delirium features, including acute onset and inattention, were not. In summary, although nurses' documentation differed between the DSD and ND groups, delirium was not recognized according to nurses' documentation.

What Do Nurses Document?

Nurses documented their patients' mental status primarily by describing orientation and confusion in both groups. This finding is consistent with previous studies (Inouye et al., 2005; Morandi et al., 2009; Speed et al., 2007) in which nurses commonly documented the term *confusion* and examples of disorientation to describe their patients' mental status. There has been a call for all health care professionals to transition to one term: *delirium* (Cheung et al., 2008; Foreman, 1993; McGuire, Basten, Ryan, & Gallagher, 2000; Milisen, Lemiengre, Braes, & Foreman, 2005). Due to old paradigms of thinking and learning, nurses are reluctant to label a phenomenon they recognize in a patient (Allen, 1997), especially if it is considered a medical diagnosis. However, to implement appropriate interventions, nurses should use a well-defined and objective label.

As found in other studies (Fick et al., 2007; Speed et al., 2007), delirium features may be misinterpreted as dementia or other similar cognitive impairments, perhaps adding to the difficulty of discerning delirium from dementia in this sample of older inpatients with dementia. Nurses documented at least one feature of delirium when participants experienced delirium. The regression analysis showed that nurses documented two of the five individual features of delirium—disorganized thinking and altered level of consciousness—when participants were experiencing delirium. Nurses also documented terms indicating that they observed fluctuating mental status in patients from the DSD group, although less often and at a nonsignificant level in the regression. In two other studies, nurses were noted to document individual but not all features of delirium or to document their conclusion that their patients were experiencing delirium (Morandi et al., 2008; Voyer, Cole, et al., 2008).

One crucial step in the delirium recognition process is assessment (Steis, Penrod, Adkins, & Hupcey, 2009) and subsequent conclusion. Although the nurses' documentation may have

been accurate to describe patients' orientation status, what they documented was not specific enough to communicate mental status to other health care professionals. Their descriptive terms and phrases were often general and nondescript instead of terms prompted by assessment tools such as the CAM. Previous work suggests that the use of assessment tools, compared with physician assessment, to diagnose delirium may result in higher levels of delirium recognition and diagnosis (van Eijk et al., 2009). Delirium is a complicated syndrome to recognize; use of an established assessment tool may ensure more consistent assessment and facilitate greater recognition of delirium in the acute care environment.

The *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, text revision (*DSM-IV-TR*) is the first edition of the *DSM* to include etiology as a feature of delirium, "evidence...that the cognitive disturbance is the direct physiological consequence of a general medical condition" (APA, 2000, p. 141). Absent from this data set is evidence that nurses documented or assessed for the etiology of delirium or the documentation that denoted a mental status change in their patients. Speed et al. (2007) noted similar results from their record review of two hospitals in Australia. Health professionals documented little to suggest they investigated the etiology of the behaviors they documented.

IMPLICATIONS OF THE FINDINGS

The most important implication from this study is that acute care nurses would benefit from widespread educational efforts coupled with clinical and decisional support emphasizing assessment of and differentiation between common geriatric syndromes. Notably, research on delirium is evolving, and nurses on average are older (mean age = 46) (American Association of Colleges of Nursing, 2011), indicating that when they received their initial nursing education, knowledge of delirium was scant. Educational efforts targeting nurses at all experience levels are needed to both deliver new information and reinforce past didactic efforts since the audience will be nurses who are caring for an increasingly aging population.

Future work in this area may develop innovative support to supplement and extend delirium educational materials to caregivers and into the home environment using the Internet, computerized decisional support, and distance education for caregivers. Family caregivers of loved ones with dementia can visually recognize subtle changes in their family members' mental status; hence, an educational effort could also extend to family caregivers of those who are known to be at high risk for developing delirium.

Practically, acute care nurses are busy and have greater responsibility to their patients and within the health care team than ever before. Use of a standardized method of mental status assessment would improve care in general as well as provide a basis for comparison among health care team members who are caring for their patients in the fast-paced acute care setting.

Nurses need to communicate their assessment findings in a more meaningful manner beginning with the consistent use of the term *delirium*. Currently, the terms and phrases nurses are using to describe their patients' mental status are ineffective. Nurses are at the bedside caring for older patients who are very ill. Accurately and effectively communicating the results of their assessments will benefit their patients and document the care in a manner useful to the rest of the health care team.

STUDY STRENGTHS AND LIMITATIONS

The retrospective nature of the data source is a limitation of this study. Analyzing nursing documentation may not be conclusive evidence that nurses do or do not recognize delirium;

however, documentation is the only route to permanently communicate assessments. Conversely, the EMR was an asset. The documentation was easily accessible and legible.

Findings from this study should be viewed cautiously. The nurses originated from one community hospital in central Pennsylvania, and the patients in this study were from a nondiverse population.

CONCLUSION

Delirium is a medical emergency that is treatable and potentially preventable. Nurses and other health care providers need to be educated regarding the definition, complicated nature, importance of regular assessment, and use of effective, consistent terminology for delirium.

KEYPOINTS

Steis, M.R., & Fick, D.M. (2012). Delirium Superimposed on Dementia: Accuracy of Nurse Documentation. *Journal of Gerontological Nursing*, 38(1), 32–42.

1. In this study, nurses did not recognize delirium, or at least did not document that they recognized delirium.
2. Nurses documented their patients' mental status primarily by describing orientation and confusion.
3. Acute care nurses would benefit from widespread educational efforts coupled with clinical and decisional support emphasizing assessment of and differentiation between common geriatric syndromes.
4. Nurses need to communicate their assessment findings in a more meaningful manner beginning with the consistent use of the term *delirium*.

Acknowledgments

Dr. Steis acknowledges research funding from the Beta Sigma Chapter of the Honor Society of Nursing, Sigma Theta Tau International, and guidance from her dissertation committee: Drs. Donna Fick (chair), Janice Penrod, Susan Loeb, and Robert Schrauf. Dr. Steis also acknowledges mentoring guidance from Drs. Lois Evans and Meredith Rowe as well as her funding through a National Research Service Award Postdoctoral Fellowship (2009–2010), "Individualized Care for At-Risk Older Adults" (T32NR009356), National Institute of Nursing Research at the University of Pennsylvania School of Nursing; and her current funded position as an HSR&D postdoctoral research fellow at the Department of Veterans Affairs Medical Center, Tampa, Florida.

REFERENCES

- Allen D. The nursing-medical boundary: A negotiated order? *Sociology of Health & Illness*. 1997; 19:498–520.
- American Association of Colleges of Nursing. Nursing shortage. 2011 Retrieved from <http://www.aacn.nche.edu/media/factsheets/nursingshortage.htm>.
- American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed.. Washington, DC: Author; 2000. text rev.
- Bellelli G, Speciale S, Barisione E, Trabucchi M. Delirium subtypes and 1-year mortality among elderly patients discharged from a post-acute rehabilitation facility. *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*. 2007; 62:1182–1183.
- Blessed G, Tomlinson BE, Roth M. The association between quantitative measures of dementia and of senile change in the cerebral grey matter of elderly subjects. *British Journal of Psychiatry*. 1968; 114:797–811. [PubMed: 5662937]

- Care for Elders Education Group. (n.d.). Table 4: Comparison of delirium, dementia and depression. Retrieved from <http://www.careforelders.ca/table4.php>.
- Cheung CZ, Alibhai SM, Robinson M, Tomlinson G, Chittock D, Drover J, Skrobik Y. Recognition and labeling of delirium symptoms by intensivists: Does it matter? *Intensive Care Medicine*. 2008; 34:437–446. [PubMed: 18087692]
- Fick D, Foreman M. Consequences of not recognizing delirium superimposed on dementia in hospitalized elderly individuals. *Journal of Gerontological Nursing*. 2000; 26(1):30–40. [PubMed: 10776167]
- Fick DM, Hodo DM, Lawrence F, Inouye SK. Recognizing delirium superimposed on dementia: Assessing nurses' knowledge using case vignettes. *Journal of Gerontological Nursing*. 2007; 33(2): 40–47. [PubMed: 17310662]
- Fick DM, Kolanowski AM, Waller JL, Inouye SK. Delirium superimposed on dementia in a community-dwelling managed care population: A 3-year retrospective study of occurrence, costs, and utilization. *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*. 2005; 60:748–753.
- Folstein MF, Folstein SE, McHugh PR. "Mini-mental state" A practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research*. 1975; 12:189–198. [PubMed: 1202204]
- Foreman MD. Acute confusion in the elderly. *Annual Review of Nursing Research*. 1993; 11:3–30.
- Friedman Z, Qin J, Berkenstadt H, Katznelson R. The confusion assessment method—A tool for delirium detection by the acute pain service. *Pain Practice*. 2008; 8:413–416. [PubMed: 18721176]
- Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Education Today*. 2004; 24:105–112. [PubMed: 14769454]
- Hughes CP, Berg L, Danziger WL, Coben LA, Martin RL. A new clinical scale for the staging of dementia. *British Journal of Psychiatry*. 1982; 140:566–572. [PubMed: 7104545]
- Inouye SK, Foreman MD, Mion LC, Katz KH, Cooney LM. Nurses' recognition of delirium and its symptoms. *Archives of Internal Medicine*. 2001; 161:2467–2473. [PubMed: 11700159]
- Inouye SK, Leo-Summers L, Zhang Y, Bogardus ST Jr, Leslie DL, Agostini JV. A chart-based method for identification of delirium: Validation compared with interviewer ratings using the Confusion Assessment Method. *Journal of the American Geriatrics Society*. 2005; 53:312–318. [PubMed: 15673358]
- Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: The Confusion Assessment Method. A new method for detection of delirium. *Annals of Internal Medicine*. 1990; 113:941–948. [PubMed: 2240918]
- Jorm AF. A short form of the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE): Development and cross-validation. *Psychological Medicine*. 1994; 24:145–153. [PubMed: 8208879]
- Laurila JV, Pitkala KH, Strandberg TE, Tilvis RS. Delirium among patients with and without dementia: Does the diagnosis according to the DSM-IV differ from the previous classifications? *International Journal of Geriatric Psychiatry*. 2004; 19:271–277. [PubMed: 15027043]
- Leslie DL, Marcantonio ER, Zhang Y, Leo-Summers L, Inouye SK. One-year health care costs associated with delirium in the elderly population. *Archives of Internal Medicine*. 2008; 168:27–32. [PubMed: 18195192]
- Marcantonio E, Ta T, Duthie E, Resnick NM. Delirium severity and psychomotor types: Their relationship with outcomes after hip fracture repair. *Journal of the American Geriatrics Society*. 2002; 50:850–857. [PubMed: 12028171]
- Margiotto A, Bianchetti A, Ranieri P, Trabucchi M. Clinical characteristics and risk factors of delirium in demented and not demented elderly medical inpatients. *The Journal of Nutrition, Health & Aging*. 2006; 10:535–539.
- McAvay GJ, Van Ness PH, Bogardus ST Jr, Zhang Y, Leslie DL, Leo-Summers LS, Inouye SK. Older adults discharged from the hospital with delirium: 1-year outcomes. *Journal of the American Geriatrics Society*. 2006; 54:1245–1250. [PubMed: 16913993]

- McGuire BE, Basten CJ, Ryan CJ, Gallagher J. Intensive care unit syndrome: A dangerous misnomer. *Archives of Internal Medicine*. 2000; 160:906–909. [PubMed: 10761954]
- Milisen K, Foreman MD, Wouters B, Driesen R, Godderis J, Abraham IL, Broos PL. Documentation of delirium in elderly patients with hip fracture. *Journal of Gerontological Nursing*. 2002; 28(11): 23–29. [PubMed: 12465199]
- Milisen K, Lemiengre J, Braes T, Foreman MD. Multicomponent intervention strategies for managing delirium in hospitalized older people: Systematic review. *Journal of Advanced Nursing*. 2005; 52:79–90. [PubMed: 16149984]
- Morandi A, Pandharipande P, Trabucchi M, Rozzini R, Mistraretti G, Trompeo AC, Ely EW. Understanding international differences in terminology for delirium and other types of acute brain dysfunction in critically ill patients. *Intensive Care Medicine*. 2008; 34:1907–1915. [PubMed: 18563387]
- Morandi A, Solberg LM, Habermann R, Cleeton P, Peterson E, Ely EW, Schnelle J. Documentation and management of words associated with delirium among elderly patients in post-acute care: A pilot investigation. *Journal of the American Medical Directors Association*. 2009; 10:330–334. [PubMed: 19497545]
- Pisani MA, Inouye SK, McNicoll L, Redlich CA. Screening for preexisting cognitive impairment in older intensive care unit patients: Use of proxy assessment. *Journal of the American Geriatrics Society*. 2003; 51:689–693. [PubMed: 12752846]
- Pitkala KH, Laurila JV, Strandberg TE, Tilvis RS. Prognostic significance of delirium in frail older people. *Dementia and Geriatric Cognitive Disorders*. 2005; 19(2–3):158–163. [PubMed: 15627764]
- Speed G, Wynaden D, McGowan S, Hare M, Landsborough I. Prevalence rate of delirium at two hospitals in Western Australia. *Australian Journal of Advanced Nursing*. 2007; 25:38–43.
- Steis MR, Penrod J, Adkins CS, Hupcey J. A principle-based concept analysis: Recognition in the context of nurse-patient interactions. *Journal of Advanced Nursing*. 2009; 65:1965–1975. [PubMed: 19694860]
- van Eijk MM, van Marum RJ, Klijn IA, de Wit N, Kesecioglu J, Slooter AJ. Comparison of delirium assessment tools in a mixed intensive care unit. *Critical Care Medicine*. 2009; 37:1881–1885. [PubMed: 19384206]
- Voyer P, Cole MG, McCusker J, St-Jacques S, Laplante J. Accuracy of nurse documentation of delirium symptoms in medical charts. *International Journal of Nursing Practice*. 2008; 14:165–177. [PubMed: 18315830]
- Voyer P, Richard S, Doucet L, Danjou C, Carmichael P-H. Detection of delirium by nurses among long-term care residents with dementia. *BMC Nursing*. 2008; 7:4. [PubMed: 18302791]

Figure.

Illustration of the process detailing the transition from 138 participants in the parent study to the 104 participants in the chart audit.

Note. CAM = Confusion Assessment Method (Inouye et al., 1990); DSD = delirium superimposed on dementia; EMR = electronic medical record.

TABLE 1
CHARACTERISTICS OF NURSES FROM HOST HOSPITAL

Variable	RNs (<i>n</i> = 374)	LPNs (<i>n</i> = 33)
Mean age	39	48
Has specialty certifications (<i>n</i>)	16	0
RN educational level (<i>n</i>)		
Diploma	71	
Associate's degree	190	
Bachelor's degree	108	
Master's degree	5	
Agency hours paid in fiscal year 2008	44,309.75	

Note. Information reflects data provided by the host hospital in May 2009. Data collection occurred from July 2006 to September 2008.

LPN = licensed practical nurse.

TABLE 2**CAM DELIRIUM MAPPING CRITERIA**

Criteria Code	CAM Criteria for Delirium
0	Does not map to any category
1	Acute onset: Is there evidence of an acute change from the patient's baseline?
2	Fluctuating course: Did the abnormal behavior fluctuate during the day, that is, tend to come and go or increase or decrease in severity?
3	Inattention: Did the patient have difficulty focusing attention; for example, being easily distractible or having difficulty keeping track of what was being said?
4	Disorganized thinking: Was the patient's thinking disorganized or incoherent (e.g., rambling or irrelevant conversation, unclear or illogical flow of ideas) or unpredictable (e.g., switching from subject to subject)?
5	Altered level of consciousness: Overall, how would you rate the patient's level of consciousness?

Note. CAM = Confusion Assessment Method.

Source. Inouye et al. (1990).

TABLE 3**CHARACTERISTICS OF PATIENT SAMPLE ($N = 108$)**

Variable	DSD Group ($n = 54$)	ND Group ($n = 54$)
Mean age (range)	85.4 (72 to 99)	81.5 (65 to 96)
Female gender	51%	63%
	Mean (SD)	Mean (SD)
Years of education	12.5 (3.2)	12.3 (2.9)
Comorbidities	2.5 (1.6)	2.4 (1.2)
CDR score before hospitalization	1.6 (0.8)	1.1 (0.7)
MBDRS score before hospitalization	9.0 (3.7)	6.8 (2.9)
IQCODE score before hospitalization	4.5 (0.5)	4.1 (0.7)
MMSE score		
On admission to acute care	12.7 (6.5)	20.3 (4.8)
On discharge from acute care	12.7 (6.9)	22.1 (6.4)
Length of stay (days)	8.7 (5.5)	6.4 (2.9)

Note. DSD = Delirium superimposed on dementia; ND = no delirium; CDR = Clinical Dementia Rating scale (Hughes, Berg, Danziger, Coben, & Martin, 1982), where possible scores range from 0 (no dementia) to 3 (severe dementia); MBDRS = Modified Blessed Dementia Rating Scale (Blessed, Tomlinson, & Roth, 1968), where patients were presumed to have dementia if they had a score greater than 3; IQCODE = Informant Questionnaire on Cognitive Decline in the Elderly, short form (Jorm, 1994), where patients were presumed to have dementia if they had a score of 3.3 or greater; MMSE = Mini-Mental State Examination (Folstein, Folstein, & McHugh, 1975), where scores range from 0 (severe cognitive impairment) to 30 (no cognitive impairment).

TABLE 4
CATEGORIES OF WORDS/DESCRIPTIVE PHRASES EXTRACTED FROM NURSE DOCUMENTATION

Mental Status Attribute	DSD Group		ND Group		Terms/Phrases Used to Indicate Attribute
	n	Number of Days Attribute Documented	n	Number of Days Attribute Documented	
Acute change in mental status	0	0	0	0	No documentation indicated an acute change in mental status from baseline
Fluctuating mental status	13	15	0	0	"More awake today"; "Improvement noted"; "Improvement from last night"; "Increased confusion"; "Less alert today"; "MS improved"
Inattention	0	0	1	1	Documentation indicating difficulty focusing attention, being easily distractible, or having difficulty keeping track of what was being said, (e.g. "short attention span")
Disorganized thinking	3	5	1	1	"Unable to follow commands"
Organized thinking	6	10	2	2	"Follows commands"; "Answers questions appropriately"
Lethargy	13	20	0	0	"Lethargic"; "Unresponsive in general"; "Very lethargic"; "Slow to respond to questions"; "Sometimes only responds with a grunt"; "Less alert, harder to arouse"; "Sleeping more, slow to respond"
Orientation	24	34	40	57	"Alert and oriented to person, place, time"; "Alert and oriented"; "Alert and oriented × 4"; "Oriented to person only"
Disorientation	19	24	8	11	"Believes time is in morning [at 9 p.m.]"; "Unable to tell place"; "Completely disoriented"
Alert	38	53	41	62	"Awake and alert"; "Alert and oriented"; "Alert to person"; "Alert to name only"; "Not alert to person"
Awake	4	5	9	12	"Awake and alert"; "Awake"
Confusion	29	43	12	19	"Continues to be confused"; "Becomes confused at times"; "Confused"; "Very confused"
No confusion	0	0	2	2	"No confusion noted"
Agitation	8	15	2	2	"Became increasingly agitated"; "A little agitated"; "Very agitated"; "Irritated"; "Dangerously agitated"; "Periods of agitation"; "Agitated"
Cooperation	10	13	6	7	"Cooperative"; "Following commands"; "Finally cooperative"; "More cooperative"
Lack of cooperation	9	14	1	1	"Refused medication"; "Refusing Ativan®"; "Refusing to eat"; "Refuses vital signs"; "Uncooperative"; "Resisting oral care"
Negative behavior	18	28	8	10	"pulled IV out twice"; "Pulls at Foley catheter"; "Attempts to climb out of bed"; "Disturbing roommate"; "Combative"; "Calling out for husband"; "Calling out unknown names"; "Attempted to spit on staff"
Hallucinations	2	2	0	0	"Visual hallucinations"
Positive affect	8	10	8	8	"Quiet"; "Pleasant"; "Disposition has improved"; "Calm at present"; "Good spirits"
Negative affect	2	2	0	0	"Very angry"
Memory deficit	3	3	7	8	"Forgetful"; "Has trouble remembering"; "Poor short-term memory"; "Forgets easily"; "Forgets to ring for assistance"; "Forgetful at times"

Mental Status Attribute	DSD Group		ND Group		Terms/Phrases Used to Indicate Attribute
	<i>n</i>	Number of Days Attribute Documented	<i>n</i>	Number of Days Attribute Documented	
Etiology of change in mental status	0	0	0	0	No documentation indicated a source of change in mental status (e.g., confusion from anesthesia; UTI causing confusion)
Anxiety	4	4	3	3	"Anxious"
Dementia	3	3	1	1	"History of dementia"; "Dementia continues"
Delusions	4	4	1	1	"Thought she was a child"; "Trying to move backhoe"; "Trying to leave to go to shopping mall"; "Thinks she is in attic"
Restless	6	11	1	1	"Restless"

Note. DSD = delirium superimposed on dementia; ND = no delirium; MS = mental status; IV = intravenous; UTI = urinary tract infection.

TABLE 5

LOGISTIC REGRESSION WITH REPEATED MEASURES FOR CAM DELIRIUM CRITERIA

CAM Delirium Feature	Odds Ratio ^a	95% Confidence Interval	p Value
Acute change in mental status ^b	–	–	–
Fluctuating mental status	1.011	[0.488, 2.092]	0.977
Inattention	2.052	[0.643, 6.549]	0.225
Disorganized thinking	2.966	[1.449, 6.070]	0.003
Altered level of consciousness	23.462	[3.129, 175.901]	0.002
At least one CAM feature	2.822	[1.327, 6.001]	0.007
At least three CAM features	7.219	[0.886, 58.806]	0.065

Note. CAM = Confusion Assessment Method (Inouye et al., 1990). Items in bold indicate statistical significance.

^a The odds ratio determined the likelihood of nurses documenting the attribute in the group with delirium superimposed on dementia versus the group without dementia.

^b Not enough data were provided to run the regression analysis on this attribute.