Delirium, or acute confusion, is a common cause of morbidity and mortality (Inouye, 1999; Rizzo et al., 2001). It is estimated that delirium affects more than 2.3 million older hospitalized patients and accounts for more than $4 billion annually in Medicare expenditures (Inouye, Bogardus, et al., 1999). Patients who experience delirium while hospitalized are more likely to have adverse reactions to medications, acquire hospital infections, fall, develop pressure ulcers, and have longer hospital stays compared with patients who do not develop delirium (Foreman, Mion, Tryostad, & Fletcher, 1999; Kales, Kamholz, Visnic, & Blow, 2003).

In addition, delirium is associated with poorer functional status and greater need for institutionalized care (Dolan et al., 2000; Edelstein et al., 2004; Marcantonio, Flacker, Michaels, & Resnick, 2000; O’Keeffe & Lavan, 1997). Prevalence rates of delirium present at hospital admission range from 4% to 53.3% in medical inpatients (Bruce, Ritchie, Blizard, Lai, & Raven, 2007; Milisen, Foreman, Godderis, Abraham, & Broos, 1998). In addition, patients with dementia have a high prevalence of delirium superimposed on dementia, ranging from 22% to 89% (Fick, Agostini, & Inouye, 2002).

The large variation in reported delirium rates is most likely due to characteristics of the sample, such as age, the method of case finding, and the diagnostic criteria used. A consistent theme in the literature is that inadequate care processes designed to prevent common complications for older patients lead to high rates of delirium. Interventions that prevent delirium or help with its management have the potential to improve outcomes for elderly hospitalized patients at risk for the condition (Inouye, Schlesinger, & Lydon, 1999).

**Purpose**

The purpose of this article is to summarize the evidence-based practice guideline, *Acute Confusion/Delirium* (Sendelbach & Guthrie, 2009). The guideline provides direction for identifying risk factors, conducting appropriate assessments, and implementing effective strategies for preventing and treating delirium in elderly hospitalized patients. It is intended for use by nurses and members of other health care disciplines who provide care for older adults on general medical-surgical hospital units. Some of the recommended interventions require physician management and interdisciplinary collaboration, while other interventions are independent nursing actions.

**Definition of Key Terms**

The terms *acute confusional state, acute confusion,* and *delirium* are all terms to describe acute cognitive impairment associated with severe illness. Use of different descriptive and diagnostic terms for acute cognitive impairments likely contributes to clinicians’ failure 33% to 66% of the time to identify older patients with delirium (Kales et al., 2003; Levkoff, Besdine, & Wette, 1986). It is likely that using different terms also con-
tributes to difficulties in creating one cohesive body of evidence that could be used to improve the care of older adults with delirium (Milisen, Lemienre, Braes, & Foreman, 2005; Siddiqi, Stockdale, Holmes, & Britton, 2006). Delays in care and treatment for delirium occur when changes in cognition are inappropriately diagnosed as dementia or depression. It is therefore vital for clinicians to differentiate the presence of delirium (acute) from dementia (chronic) and depression.

The definition of delirium tends to be relatively standard, as the currently accepted definition from the American Psychiatric Association’s (APA) (2000) Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR) is so widely recognized and used. Theoretically, the term acute confusion is broader than the diagnosis of delirium and includes prodromal changes not considered diagnostic for delirium, such as restlessness and diffuse anxiety. One distinction that may be helpful is that delirium is typically a medical diagnosis and has relatively standard use in medical practice and interdisciplinary research. For example, the Nursing Intervention Classification system uses delirium management as an intervention classification. Acute confusion, however, is a nursing diagnosis that stems from patients’ experience and behavioral response to their health condition (Ackley & Ladwig, 1999). Acute confusion is a commonly accepted nursing concept and a Nursing Outcome Classification term. This guideline will use the terms acute confusion/delirium.

DELIRIUM

Delirium is an altered state of consciousness accompanied by a change in cognition that develops over a few hours or days and tends to have a fluctuating course (APA, 2000). A nursing diagnosis of acute confusion can be applied to the patient before meeting the criteria for delirium. Specifically, delirium as defined in the DSM-IV-TR (APA, 2000) includes both essential and associated features. The essential features include the following elements:

- The disturbance is manifested by a reduced clarity of awareness of the environment. The ability to focus, sustain, or shift attention is impaired.

  * There is an accompanying change in cognition that may include memory impairment, disorientation, language disturbance, or development of a perceptual disturbance.

  * The disturbance develops over a short period of time and tends to fluctuate during the course of the day.

  Associated features include disturbances in the sleep-wake cycle, disturbances in emotions, and disturbed psychomotor behavior, including hyperactive, hypoactive, mixed, or unclassifiable (APA, 2000).

At least four clinical subtypes of delirium have been identified from patterns of psychomotor activity and alertness (O’Keeffe & Lavan, 1999; Sandberg, Gustafson, Brännström, & Bucht, 1999):

- Hyperactive delirium (i.e., restlessness/agitation, irritability, and aggression).

- Hypoactive delirium (i.e., latency in reaction and in response to verbal stimuli and psychomotor slowing).

- Mixed delirium (i.e., both hyperactive and hypoactive delirium).

- Unclassifiable.

At times, delirium has also been categorized as postoperative, especially in patients with cardiac problems or hip fractures (Bowman, 1992; Gustafson, Brännström, Norberg, Bucht, & Winblad, 1991), or as nocturnal and known as sundown syndrome, where confusion is seen primarily or exclusively after dark (Beel-Bates & Rogers, 1990).

INDIVIDUALS/PATIENTS AT RISK FOR DELIRIUM

Although everyone has potential to develop delirium, not everyone is equally prone to the syndrome (Inouye, 1999; Inouye & Charpentier, 1996). Individuals who are older, sicker, and have functional impairments or preexisting cognitive
deficits are more likely to develop delirium while hospitalized (Francis, 2004; Inouye, Viscoli, Horwitz, Hurst, & Tinetti, 1993). Prevention of delirium starts with identifying patients at risk.

A predictive delirium model based on the interrelationship between the patient’s baseline vulnerability at hospital admission and contributing factors serves as the framework for assessment and intervention for this guideline (Inouye & Charpentier, 1996; Inouye et al., 1993, 2007). This model helps nurses individualize interventions on the basis of the unique combination of factors that are specific to each patient's presentation (Figure). Delirium is primarily multifactorial, and identification of a single cause frequently leads to an incomplete plan of care. Two kinds of factors—predisposing and precipitating—usually contribute to the development, severity, and duration of delirium (Table). Thus, it is necessary for nurses to assess for both kinds of factors when caring for older adults.

**Predisposing factors** are patient characteristics present at hospital admission that affect a patient’s vulnerability for developing delirium during hospitalization (Table). For example, older patients with pre-existing cognitive impairment are at high risk for developing delirium. **Precipitating factors** precede the development of delirium and are noxious insults, or hospital-related factors that contribute to the development of delirium (Table). These factors include iatrogenic events, polypharmacy and medication effects, presence of medical devices (e.g., restraints, bladder catheters), infections, metabolic and electrolyte disturbances, dehydration, immobilization, environmental conditions, lack of sleep, anxiety, and acute admissions for fractures.

Patients with high vulnerability at hospital admission require fewer or relatively trivial precipitating factors to cause an episode of delirium. For example, an elderly patient with dementia, hearing deficits, and functional limitations at hospital admission may develop delirium simply with a small decrease in oxygen saturation. Patients with low vulnerability at hospital admission require a greater number, or more noxious precipitating factors, to cause an episode of delirium. These patients have more reserve, and it takes a greater level of insult for delirium to occur. Delirium in a patient with low vulnerability at hospital admission requires an in-depth assessment and management of potentially multiple contributing factors. In general, the goal of nursing care is to eliminate or lessen the severity of all potential precipitating factors unique to each patient’s condition and circumstance.

### ASSESSMENT
Through research, several key assessment principles have been identified:
- Nurses should have a high degree of suspicion for delirium in older adults, specifically for those with predisposing factors that increase the risk for delirium (Inouye et al., 1993; Registered Nurses Association of Ontario, 2003).
- Nurses must recognize that delirium may be superimposed on

**TABLE**

<table>
<thead>
<tr>
<th>Predisposing Factors: Vulnerability Factors Prior to Hospital Admission</th>
<th>Precipitating Factors: Noxious Insults During Hospitalization</th>
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</thead>
<tbody>
<tr>
<td>Cognitive impairment</td>
<td>Use of physical restraints</td>
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<tr>
<td>Severity of illness</td>
<td>Indwelling bladder catheter</td>
</tr>
<tr>
<td>Older age</td>
<td>Metabolic disturbances such as azotemia, pH alterations, and nutritional deficiencies</td>
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<tr>
<td>Depression</td>
<td>Polypharmacy</td>
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<tr>
<td>Vision and/or hearing impairment</td>
<td>Iatrogenic events</td>
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<tr>
<td>Functional impairment</td>
<td>Pain</td>
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<tr>
<td>Infection, particularly urinary tract and respiratory</td>
<td>Dehydration</td>
</tr>
<tr>
<td>Electrolyte imbalances, especially those related to sodium and potassium</td>
<td>Immobilization</td>
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<tr>
<td>Acute hospital admission for fractures and hip surgery</td>
<td>Medications with anticholinergic effects</td>
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<tr>
<td>Environment</td>
<td>Anxiety</td>
</tr>
<tr>
<td>Lack of sleep</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Bowman (1992); Contín, Perez-Jara, Alonso-Contín, Enguix, and Ramos (2005); Duppils and Wikblad (1998); Foreman, Mion, Tryostad, and Fletcher (1999); Han et al. (2001); Inouye (1999); Inouye & Charpentier (1996); Inouye, Viscoli, Horwitz, Hurst, and Tinetti (1993); Kalisvaart et al. (2006); McAvay et al. (2007); and McCusker et al. (2001).
dementia and differentiate baseline from more acute changes in cognitive function (Fick & Foreman, 2000; Registered Nurses Association of Ontario, 2003).

- Assessment for predisposing/vulnerability factors for delirium should occur on hospital admission for all elderly patients and are the most powerful factors for identifying patients at greatest risk for developing delirium (Inouye & Charpentier, 1996; Inouye et al., 1993, 2007).

- Assessment for predisposing/vulnerability factors should include findings from the patient’s history and physical examination. Pre-existing cognitive impairment, severity of presenting illness, and older age are the most consistent risk factors identified for the development of delirium (Table) (Contín, Perez-Jara, Alonso-Contín, Enguix, & Ramos, 2005; Inouye, 2006).

- Assessment for precipitating factors/noxious insults (Table) for delirium should occur on admission and throughout the patient’s hospital stay (Inouye & Charpentier, 1996; Inouye et al., 1993, 2007).


- Describing behaviors provides better information than using the term confusion to document cognitive changes in older patients (Morency, Levkoff, & Dick, 1994; Palmateer & McCartney, 1985).

- Nurses’ recognition and assessment of delirium can be enhanced with education on assessing cognition, cognitive impairment, features of delirium, and factors associated with poor recognition of delirium in older adults (Inouye et al., 2001; Palmateer & McCartney, 1985).

**Assessment Tools**

Two general kinds of instruments tend to be used for assessing delirium: mental status questionnaires and observational tools or symptom checklists. Mental status instruments are helpful because they directly test the patient’s cognitive performance. However, performance on mental status tests is strongly affected by age, educational level, ethnicity, and language (Anthony, LeResche, Niaz, von Korff, & Folstein, 1982; Bird, Canino, Stipec, & Shrout, 1987), and such tests may be difficult for acutely ill patients to perform. Advantages of observational instruments as compared with mental status questionnaires include the minimal response burden for patients, and both cognitive and behavioral function can be observed and evaluated frequently. A primary disadvantage of observational instruments is that they do not directly test cognitive and behavioral function but are dependent on the clinician’s judgment.

The criteria for choosing the most appropriate standardized instrument includes the psychometric properties of the tool, the clinical feasibility of the scale, patient acceptability, and need for a diagnostic or screening instrument versus one for monitoring cognitive function over time (Foreman, 1993). A variety of measures for assessing delirium may be needed because each instrument is designed for different purposes. Copies of the following tools and instructions for use are included in the full guideline (Sendelbach & Guthrie, 2009).

**Confusion Assessment Method.** The Confusion Assessment Method (CAM) is a diagnostic, observational instrument based on the DSM, third edition, revised (APA, 1987), criteria for delirium and was developed to help clinicians without a psychiatric background to quickly identify delirium. The tool helps identify the syndrome’s essential and associated features necessary for making a diagnosis of delirium and is useful in distinguishing the difference between delirium and dementia. The instrument consists of nine open-ended questions and a diagnostic algorithm that requires subjective clinical judgment by the rater (Inouye et al., 1990; Lemiembre et al., 2006). The CAM was developed to include an assessment of cognitive status with the Mini-Mental State Examination (MMSE) (Folstein, Folstein, & McHugh, 1975). Following use of the MMSE, the interviewer uses a decision process to determine whether delirium is present. Features one (acute onset and fluctuating course) and two (inattention) must be present, with either feature three (disorganized thinking) or four (altered level of consciousness) present to diagnose delirium.

**Delirium Index.** The Delirium Index (DI) is adapted from the CAM and intended as a measure of the severity of delirium based on patient observation from a nonpsychiatrist clinician, without additional information from family members, nursing staff, or medical charts (McCusker, Cole, Bellavance, & Primeau, 1998;
McCusker, Cole, Dendukuri, & Belzile, 2004). The DI includes seven domains: disorders of attention, thought, consciousness, orientation, memory, perception, and psychomotor activity. The total score ranges from 0 to 21, with higher scores indicating greater severity.

**NEECHAM Confusion Scale.**
The NEECHAM Confusion Scale is a nursing instrument useful for measuring the level of confusion in cognitive processing, behavior, and physiological control. Involving bedside observation and interaction with the patient, the scale incorporates data from a nurse’s assessment of patient responses. The instrument, which assists in assessing the risk, presence, and severity of confusion, includes nine scaled items divided into three subscales that measure information processing, behavior and performance, and vital function. Scores range from 0 to 30. A score ranging from 0 to 19 indicates severe to moderate confusion, 20 to 24 indicates mild or early development of confusion, 25 to 26 indicates normal function with a risk for developing acute confusion, and 27 to 30 indicates normal functioning (Neelon, Champagne, Carlson, & Funk, 1996).

**Mini-Cog.** The Mini-Cog is a screening tool for cognitive impairment and is recommended for use with all older patients admitted to the hospital. The tool requires minimal tester training and equipment (paper and pencil or pen) and takes approximately 3 to 5 minutes to administer. Patients are asked to listen, remember, and repeat three unrelated words the tester provides. The patient is then asked to draw a clock, write the numbers on the clock, and draw the clock hands to indicate a specific time. The patient is again asked to repeat the three words. Possible scores range from 0 to 5, with 0 to 2 suggesting high likelihood of cognitive impairment and 3 to 5 indicating low likelihood of cognitive impairment. The Mini-Cog predicts delirium in older adults, and patients with abnormal results are five times more likely to develop delirium compared with those with normal scores (Alagikrishnan et al., 2007).

**INTERVENTIONS**

Older adults at high risk for delirium require interventions that eliminate or lessen the effects of potential precipitating factors. Delirium rarely has one single cause for the condition and has a multi-factorial etiology (Inouye & Charpentier, 1996). Primary prevention of delirium is probably the most effective strategy for reducing the overall incidence of delirium of older hospitalized medical-surgical patients (Cole et al., 2002; Inouye, Bogardus, et al., 1999; Milisen et al., 2001).

**Multicomponent Interventions**
The presence of predisposing factors and interaction with precipitating factors increases patient vulnerability to development of delirium. The multifactorial nature of delirium has led to studies of hospitalized patients focusing on multiple interventions aimed at reducing or eliminating factors that can be changed.

Consistent interventions in the multicomponent studies included nurse and/or physician education on delirium, including:
- Identification of assessment, risk, and underlying causes of delirium (Lundström et al., 2005; Lundström, Edlund, Lundström, & Gustafson, 1999; Milisen et al., 2001).
- Guidance for staff nurses regarding care (Kurlowicz, 2001; Lundström et al., 2005; Milisen et al., 2001).
- Electrolyte balance (Marcantonio, Flacker, Wright, & Resnick, 2001; Simon, Jewell, & Brokel, 1997).
- Promotion of nutrition (Lundström et al., 1999; Marcantonio et al., 2001).
- Orientation to current reality, including modifications to the environment such as clocks and calendars (Inouye, Bogardus, Baker, Leo-Summers, & Cooney, 2000; Inouye, Bogardus, et al., 1999; Kurlowicz, 2001; Lundström et al., 2005; Marcantonio et al., 2001).
- Consistent caregivers (Lundström et al., 1999, 2005; Simon et al., 1997).
- Pain management (Marcantonio et al., 2001; Milisen et al., 2001; Simon et al., 1997).
- Elimination of unnecessary medications/medication management (Kurlowicz, 2001; Marcantonio et al., 2001; Simon et al., 1997).
- Discontinuation of bladder catheter (Inouye et al., 2000; Inouye, Bogardus, et al., 1999; Marcantonio et al., 2001).
- Appropriate use of eyeglasses and hearing aids (Inouye et al., 2000; Inouye, Bogardus, et al., 1999; Marcantonio et al., 2001).
- Sleep promotion (Inouye et al., 2000; Inouye, Bogardus, et al., 1999; Simon et al., 1997).

**Single Component Interventions**
Several essential studies identify important single interventions that demonstrate some effect on decreasing the incidence or lessening the severity of delirium. They include: educational interventions for nurses and physicians for increasing awareness and knowledge of delirium (Tabet et al., 2005; Young & George, 2003); music as a therapy (McCaffrey & Lociosn, 2004); preoperative patient teaching that includes an explanation about the potential for unusual sensory or cognitive postoperative experiences (Owens & Hutelmyer, 1982); family interaction with patients focusing on use of eye contact, frequent touch, and verbal orientation to time, person, and place (Chatham, 1978); and reorientation procedures, such as calendars in the room, orientation techniques.
Pharmacological Interventions
Pharmacological interventions include prophylactic use of haloperidol (Haldol®), which has demonstrated limited effect on the duration and severity of delirium in postoperative patients at intermediate or high risk of developing delirium (Kalvisaart et al., 2005; Lonergan, Britton, Luxenberg, & Wyller, 2007), use of atypical antipsychotic medications that have been demonstrated to reduce the severity of delirium in older and/or postoperative patients (Alao & Moskowitz, 2006), and use of gabapentin (Neurontin®) in managing postoperative pain (Leung et al., 2006).

ASSESSING EFFECTIVENESS OF GUIDELINES
Evaluation of the delirium guidelines should include both process and patient outcomes. Nurses’ understanding of the following should be evaluated: knowledge to carry out the guidelines; implementation of guidelines enhancing the quality of care; support of staff, physicians, and administration in the use of the guidelines; ability to identify risk for delirium; assessing delirium using screening tools; providing intervention; and identifying factors that put the patient at risk. Forms for evaluating process and outcome measures are included in the full guideline (Sendelbach & Guthrie, 2009).

In assessing outcomes of the delirium guideline, the focus is on prevention and decreasing the severity of delirium, risk identification, and management without chemical and/or physical restraints. Specifically, patient outcomes expected to improve from consistent use of the guideline include incidence of delirium during hospitalization, presence and severity of delirium at hospital discharge, use of physical or chemical restraints, and patient safety incidents during episodes of delirium.

Successful implementation of this guideline requires support systems, including nurse and physician education (Lundström et al., 2005) as well as processes that facilitate adherence to the guidelines (Inouye, Bogardus, Williams, Leo-Summers, & Agostini, 2003) and interventions for preventing delirium (Inouye, Bogardus, et al., 1999; Lundström et al., 1999, 2005; Milisen et al., 2001). Periodic evaluation of patients’ outcomes is accomplished by using the outcomes monitor included in the full guideline (Sendelbach & Guthrie, 2009).

CONCLUSION Delirium is a serious problem affecting older hospitalized patients. Primary prevention has been suggested to be the most effective strategy for reducing the overall incidence of delirium in patients on medical-surgical units (Cole et al., 2002; Inouye, Bogardus, et al., 1999; Milisen et al., 2001). Nurses are uniquely positioned to implement strategies to help prevent delirium and its adverse outcomes for older hospitalized patients, and this guideline is an important tool to help in that effort.

REFERENCES
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