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ELDER CARE

A Resource for Interprofessional Providers

Preventing and Managing Delirium in the ICU

Samantha Russell, MD, College of Medicine, University of Arizona

What is delirium?

Delirium is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) as a disturbance in attention and consciousness that can be associated with other cognitive symptoms, such as disorientation, speech disturbance or memory deficits. To meet the complete diagnostic criteria, these symptoms must develop within a short timeframe (hours to days), coincide with the onset of physical illness and cannot be attributed to other pre-existing disorders. Delirium can present as hyperactive delirium (restlessness, agitation, hallucinations, unruly/ uncooperative behavior), hypoactive delirium (apathy, lethargy, slowed speech and movements), or as a combination of hyperactive and hypoactive symptoms. These symptoms tend to fluctuate in severity – and it is this waxing and waning characteristic that is essential for differentiating delirium from other neurocognitive disorders.

Why is it important to recognize delirium?

Delirium is present in approximately 10-30% patients over the age of 65 presenting to the emergency department and approximately 80% in the ICU. Furthermore, these older patients are more likely to exhibit hypoactive symptoms which commonly go unrecognized by providers or inappropriately attributed to advanced age, dementia, depression or fatigue, thereby leading to underdiagnosis. Delirium can result in severe adverse outcomes in patients, including longer hospital stays, higher mortality and institutionalization rates, higher hospital costs, as well as permanent cognitive impairment. Therefore prevention, early recognition and treatment are essential for improving outcomes.

Who is at risk for delirium in the ICU?

The exact pathophysiology of delirium is not fully understood. Hypotheses range from neurotransmitter derangement to neuroinflammation and oxidative stress. The etiology of delirium is likely multifactorial, with risks including dementia, mechanical ventilation, severe illness and various medications. A list of common risk factors are presented in Table 1. The most common risk factors are advanced age and underlying cognitive impairment.

Table 1. Risk Factors for Delirium

Age >65	Malnutrition
Alcoholism	Pain
Anemia	Preexisting cognitive impairment
Chronic hepatic insufficiency	Preexisting depression
Chronic renal insufficiency	Prior history of delirium
Drugs given in ICU:	Respiratory disease
Anticholinergics	Sepsis
Benzodiazepines	Severity of illness
Opioids	Shock
Electrolyte abnormalities	Smoking
Hearing impairment	Terminal illness
HIV	Vision impairment
Hypertension	

How do we prevent delirium among patients in the ICU?

It is imperative to identify modifiable risk factors and prevent the onset of delirium in older patients. Nonpharmacological prevention techniques include maintaining a normal sleep-wake cycle, early mobilization, use of visual and hearing aides, avoidance of dehydration and constipation, adequate nutrition, frequent orientation, and sufficient pain control. In the ICU, special attention needs to be directed at sedating medications. Care should be taken to ensure minimal exposure, when clinically appropriate, through bolus dosing instead of continuous infusions, tight sedation control with light sedation goal instead of deep sedation, and ensuring daily interruptions in sedation. Physical restraints can both cause and worsen delirium, therefore, use of physical restraints should be avoided. There are currently no pharmacological interventions aimed at preventing delirium. However, when used appropriately, melatonin can help to preserve a normal sleep-wake cycle. In patients requiring intubation, a mnemonic bundle has been proposed to assist with prevention and management of delirium and can be viewed in more detail in Table 2.

TIPS FOR TREATING DELIRIUM AMONG ICU PATIENTS

- Hypoactive delirium is common and can frequently go unrecognized by providers - screen ICU patients regularly for delirium using a validated tool (e.g. CAM-ICU).
- Use sedation strategies that limit exposure to benzodiazepines and other deliriogenic medications.
- Nonpharmacological techniques can prevent and treat delirium, including frequent orientation, early mobilization, and preservation of a normal sleep-wake cycle.

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Table 2: The ABCDEF Bundle for mechanically ventilated patients
A = Assess, prevent and manage pain B = Both Spontaneous Breathing Trials and Spontaneous Awakening Trials C = Choice of sedation and analgesia D = Delirium: assess, prevent and manage E = Early mobility and exercise F = Family engagement and empowerment

Delirium in ICU patients

For our older patients, acute change in cognition can have a very broad differential and should be worked-up appropriately to rule out life-threatening pathologies and to detect the underlying cause. However, delirium itself is a clinical diagnosis based on the symptoms displayed by the patient. The Society of Critical Care Medicine recommends regular screening for delirium in critically ill patients. The Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) is one such screening tool that has been found to be fast and reliable with a high degree of sensitivity and specificity for diagnosing delirium in mechanically ventilated patients. CAM-ICU is described in more detail in Table 3.

How do we prevent delirium among patients in the ICU?

Treat the underlying cause. Additionally, nonpharmacological interventions should be used as first-line prevention and treatment for delirium. These are the same behavioral risk modifying techniques as outlined above. For critically ill patients, special emphasis should be placed on frequent orientation, early mobilization and judicious use of physical restraints. The Society of Critical Care Medicine recommends the use of dexmedetomidine rather than benzodiazepines when continuous IV sedative infusions are needed in delirious patients. Benzodiazepines have been shown to be an independent risk factor for delirium, and therefore, should be avoided in older patients unless there is a specific indication.

Utilization of pharmacological treatments with haloperidol and second generation antipsychotics are common in the hospital and ICU setting, however, there is very little evidence to support this use. More so, the Society of Critical Care Medicine recommends against their use in patients with subsyndromal delirium. If a critically ill patient has hyperactive delirium and is at imminent risk of harming themselves or others, one could consider the use of these medications while starting at the lowest possible dose. For example, research has shown that intramuscular doses of Haloperidol as low as 0.5mg to 1mg can be just as effective as higher doses in older patients. QTc prolongation is a lethal side effect of these medications that requires close monitoring - careful consideration into the risks/benefits of these medications should be weighed and discussed with the patient or surrogate decision maker.

How long does delirium last?

Duration of delirium varies significantly between individuals – lasting hours to days in some older patients, and up to months in about 20% of patients. Delirium is not only a risk factor for incident dementia, but also linked to worsening existing dementia. Therefore, some older individuals never return to their baseline cognitive function after being delirious, leading to long-term impacts on cognition.

In summary, delirium is a common disorder seen in our older ICU patients and like most things in life, prevention is the best medicine.

Table 3. Confusion Assessment Method in the ICU (CAM-ICU)

Assessment Feature	Assessment Method	Diagnose Delirium if
1. Acute onset of mental status changes with fluctuating course	Assess clinically for acute change in mental status with fluctuation, or use serial Glasgow Coma Scores or sedation ratings within 24-hour periods.	• Features 1 and 2 are both present AND • Either feature 3 or 4 is present
2. Inattention	Read patient a short list of random letters and ask patient to squeeze your hand whenever the letter "A" is heard.	
3. Disorganized thinking	Hold up a certain number of fingers on your hand and ask patient to do the same.	
4. Altered level of consciousness	Rate level of consciousness. Score positive for anything other than "calm and alert".	

For more information about the CAM-ICU, please visit https://www.icudelirium.org/medical-professionals/delirium/monitoring-delirium-in-the-icu

References and Resources

American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, 5th ed, APA Press, Washington, DC 2013. https://www.psychiatry.org/psychiatrists/practice/dsm

DeMellow JM, Kim TY, Romano PS, Drake C, Balas MC. Factors associated with ABCDE bundle adherence in critically ill adults requiring mechanical ventilation: An observational design. Intensive Crit Care Nurs. 2020 Oct;60:102873.

Ely EW, Inouye SK, Bernard GR, et al. Delirium in Mechanically Ventilated Patients: Validity and Reliability of the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). JAMA. 2001;286(21):2703–2710. https://doi:10.1001/jama.286.21.2703

Wilson, J.E., Mart, M.F., Cunningham, C. et al. Delirium. Nat Rev Dis Primers 6, 90 (2020). https://doi.org/10.1038/s41572-020-00223-4

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The University of Arizona Center on Aging, PO Box 245027, Tucson, AZ 85724-5027 | info@aging.arizona.edu | https://aging.arizona.edu

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