

Delirium

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KEYWORDS

• Delirium • Elderly • Dementia • Antipsychotics • Dehydration • Long-term care

HOSPITAL MEDICINE CLINICS CHECKLIST

1. Delirium is defined as waxing and waning mental status coupled with inattention.
2. Up to 50% of elderly hospitalized patients may experience delirium.
3. Serious illness, recent surgery, hip fractures, sensory impairments, and cognitive dysfunction place patients at an increased risk of delirium.
4. Hospitalized patients who develop delirium may never return to their prehospital cognitive baseline.
5. One-year mortality in hospitalized patients with delirium may reach 60%.
6. Hypoactive delirium often goes unrecognized.
7. A delirious patient will have difficulty with tests of attention such as spelling “world” backwards or performing serial sevens.
8. Not all patients with dementia will have delirium, and not all patients with delirium will have dementia.
9. Pharmacologic restraints should be used only when patient safety is otherwise at risk. When considering antipsychotic medications for behavior management, start low and go slow: for example, haloperidol 0.25 mg intravenously not to exceed 3 mg in 24 hours, monitoring QTc carefully.
10. Prevent delirium by minimizing tethers, optimizing sleep hygiene, controlling pain, and providing frequent reorientation.

DEFINITIONS

1. What is the definition of delirium?

The sine qua non of the delirium diagnosis is inattention in a patient with a waxing and waning mental status. The *Diagnostic and Statistical Manual of Mental Disorders* (4th

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edition) identifies delirium as an intermittent disturbance in cognition that is due to a general medical condition. The Confusion Assessment Method (CAM) devised by Inouye and colleagues¹ defines delirium as an acute change in, or variation in, mental status, marked by inattention with either altered consciousness or disorganized thinking.

EPIDEMIOLOGY

1. What is the prevalence of delirium in the hospital?

Twenty to 50% of patients aged 65 years and older will experience delirium during a hospitalization.²⁻⁴ Prevalence increases in older patients, patients in the intensive care unit, and patients with risk factors for delirium.

2. What patient-specific conditions are considered risk factors for developing delirium?

Patients with known disorders affecting the brain (including Parkinson disease, dementia, and history of cerebrovascular disease) are at higher risk for developing delirium in the hospital setting. Other conditions that place patients at higher risk for delirium include polypharmacy, sensory impairments (blindness, deafness, or sensory neuropathies), serious illness, and recent surgery or hip fracture.⁵

3. What factors can be modified to reduce the risk of developing delirium?

Tethers (including the use of physical restraints), urinary catheters, intravenous lines, and telemetry monitoring have been identified as one category of modifiable risk factors for developing delirium. Other risk factors include malnutrition, dehydration, constipation, uncontrolled pain, and infection. Polypharmacy (defined as more than 3 medications prescribed) also significantly increases a patient's likelihood of developing delirium in the hospital setting; certain medications, particularly those with neuropsychiatric side effects (eg, anticholinergic medications, narcotics, psychotropics), are more likely than others to contribute to or worsen delirium.^{5,6}

4. What is the morbidity and mortality associated with hospital-associated delirium?

Hospital-acquired delirium has devastating implications for morbidity and mortality, and for patients' functional status. One-year mortality has been estimated as between 20% and 60%.^{4,7-9} Patients who suffer in-hospital delirium are more likely at 1 month to live in a long-term care environment or be rehospitalized.⁷⁻⁹ Patients who develop delirium have longer hospital stays than patients who do not.^{7,8} Despite the classic belief that delirium is a transient and reversible process, more recent studies suggest that nearly half of the patients who develop delirium while hospitalized will have cognitive impairments 1 month after discharge, which can persist for years.^{10,11}

HISTORY AND EXAMINATION

1. What is the clinical presentation of delirium?

The clinical presentation of delirium is variable because of the differing types. Three main types have been described: hypoactive, mixed, and hyperactive delirium. Patients with hypoactive delirium have diminished consciousness or are frankly somnolent, and this type of delirium may often go unrecognized. Mixed and hyperactive

forms of delirium are characterized by episodes of agitation, irritability, and emotional lability. All types of delirium involve diminished attention and cognitive impairments. Some patients may suffer perceptual disturbances (such as hallucinations) and distortion of the sleep-wake cycle.^{1,2,12,13}

2. What are common physical examination findings of delirium?

Delirium may manifest in multiple domains of physical examination. Vital signs may be altered, as agitation and paranoia may result in tachycardia and hypertension. Hypoxia may also be present if the underlying cause of the patient's delirium is a pulmonary or cardiac cause. Dehydration is a common risk factor for causing or worsening delirium, so the patient should be assessed for this. A complete neurologic examination is critical, to confirm the diagnosis of delirium and to exclude acute predisposing events such as cerebrovascular accidents or meningitis. Mental-status examination will reveal a new and acute change or variation in cognition with inattention (eg, inability to perform serial sevens or spell "world" backwards). There may be disorganized thinking, an altered level of consciousness (eg, somnolence or agitation), paranoia, and visual or auditory hallucinations.^{1,2,12,14}

3. What instruments are available to test for delirium?

There is a host of bedside tests that can assist in the diagnosis of delirium. In critically ill patients, the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) is frequently used. General medical/surgical patients are often screened using the CAM, while nursing tools such as the Neecham Confusion Scale can also be helpful, particularly for identifying the hypoactive subtype of delirium. The Mini Mental State Examination (MMSE) can be helpful, particularly when using the key components that focus on testing attention. Some experts recommend asking the patient to perform serial sevens or spell "world" backwards to test for attention deficits, although other bedside tests of attention can be used. The modified Richmond Agitation and Sedation Scale (mRASS) has also been shown to be effective at identifying delirious patients, and can be performed in under 1 minute.^{1,15,16}

4. How does a clinician differentiate a patient with dementia from a patient with delirium?

Patients can have both dementia and delirium, or delirium without preexisting cognitive impairment. For a patient to have delirium, inattention must also be present. Patients with dementia, but who are not delirious, will be able to attend to a task and will not have a history of a new or variable cognition. The history from family or caregivers will be particularly important to ensure that clinicians are familiar with the patient's baseline status. Patients with delirium will be acutely worse than their baseline, whereas patients with dementia will have problems with cognition that are long-standing.^{17,18}

DIAGNOSIS

1. How is delirium diagnosed?

Delirium typically develops over hours to days. There may be a hypoactive component that may be undetected (eg, the patient sleeps all day) before the start of a hyperactive

or mixed picture. Delirium is a clinical diagnosis that requires the presence of inattention and new changes in (or waxing and waning) cognitive status. The CAM has historically been the gold standard by which suspected delirium is identified and diagnosed. Using the CAM, patients are notably inattentive, with an acute change in mental status with a fluctuating course. Patients must also have one or both of the following: disorganized thinking and/or an altered level of consciousness. Once diagnosed, efforts must be made to identify and treat the inciting cause of the delirium.^{1,2,13,14}

2. What other disorders should be considered in the differential diagnosis of delirium?

Clinicians are often faced with the dilemma of whether the patient has dementia or delirium, or both. Understanding a patient's baseline cognitive and functional status is critical to determining if there has been an acute change in cognition. Often a patient with dementia may "sundown," during which the patient experiences a cognitive decline and worsening agitation toward the end of the day. This presentation may resemble delirium, but collateral information can be obtained from the patient's family or caregiver to help clarify whether the patient has a history of "sundowning." Patients with only dementia can attend to a task and should have no new change in cognition. Patients with delirium will have a new worsening in cognitive function and will be inattentive. When assessing a patient for delirium, other disorders to consider in the differential diagnosis include nonconvulsive status epilepticus, focal neurologic syndromes, and primary psychiatric illnesses. Withdrawal from alcohol, benzodiazepines, or other medications should be considered as a contributing factor.¹⁷⁻¹⁹

3. What is the recommended approach to laboratory tests for a patient with delirium?

Identifying potentially reversible causes of delirium is an essential part of the workup of the delirious patient. Routine testing that should be considered includes a complete blood count to evaluate for leukocytosis, serum chemistry to look for electrolyte disturbances, and kidney function and liver function tests. Other standard laboratory workup for delirium includes a thyroid-stimulating hormone level to exclude thyroid dysfunction. As part of a standard protocol to assess for cognitive dysfunction in an older adult, some also check folate and vitamin B₁₂ levels and, in certain populations, the rapid plasma reagin to exclude neurosyphilis. If there is a history of trauma, or coagulopathy, a computed tomography scan of the head may be warranted. If infection is suspected, a urinalysis with urine and blood cultures and chest radiography should be pursued. In the appropriate setting, a lumbar puncture to assess the cerebrospinal fluid may be necessary to exclude an acute intracranial process.^{12,17,18}

MANAGEMENT

1. How is delirium treated?

The cornerstone of delirium treatment is identifying and addressing the underlying etiology, as well as limiting exposure to treatments or medications that could worsen delirium. Complete medical reconciliation and review of the patient's current medication list may help identify medications that are causing or worsening the patient's condition. Exposure to medications that have psychotropic activity or anticholinergic properties should be minimized. Patients who develop delirium often have multiple potential predisposing factors, and their renal and hepatic function may be impaired. Renal function should be assessed and medications appropriately dosed. Hepatic

function is more difficult to measure; older adults often require lower doses of medications than younger adults, owing to diminished first-pass metabolism and altered hepatic function. Because this is not possible to quantify practically, using lower starting doses and titrating upwards as needed for clinical effect is advised. Moreover, the medication list should be reviewed for any medications that are affected by impaired clearance that can result in buildup of toxic metabolites (such as lithium, digoxin, and valproic acid).¹⁹

2. What strategies are recommended for managing the behaviors of the acutely delirious patient?

Clinical guidelines recommend using verbal and nonverbal techniques as a first approach to managing the acutely delirious patient. For example, removing communication barriers by providing hearing aids, glasses, and obtaining an interpreter for non-English-speaking patients will often help patients who are mildly confused. Because behaviors are often manifestations of a cognitively impaired patient's inability to verbally communicate his or her needs, it may be helpful to provide scheduled toileting, and ensure that any pain or suffering is addressed and that other essential needs (eg, hunger, thirst) are met. If a patient is having difficulty staying in bed, and falls are a concern, implementing a fall-prevention protocol should be considered.

3. What is the role for antipsychotics in treating patients with delirium?

If there is concern that patients may cause harm to themselves or others because of their agitation, pharmacologic treatment may be tried. However, many experts caution against the use of antipsychotics, and their benefits are not clear. The expression "start low and go slow" is commonly invoked when considering starting neuroleptic medications for behavior management in the elderly patient with delirium. The National Institute for Health and Clinical Excellence (NICE) guidelines recommend using low-dose haloperidol (such as 0.25 mg intravenously) or olanzapine sparingly.²⁰ Both can prolong the corrected QT interval, so a baseline electrocardiogram should be obtained before starting these medications. If the patient has a corrected QT interval of greater than 450 milliseconds, telemetry should be initiated for careful monitoring. Studies indicate that if a patient does not have a prolonged QTc and does not have any risk factors for prolongation, the patient can safely receive up to 2 mg intravenous haloperidol per day without requiring telemetry monitoring. If antipsychotic medication is started in the hospital, this should be clearly communicated to the accepting providers at discharge with a clear plan to taper and discontinue the medication as soon as possible.^{21–24} Benzodiazepines are not recommended for the treatment of delirium.²⁰

PREVENTION

1. What strategies are recommended for the prevention of delirium?

Nonpharmacologic interventions that have been shown to be effective in several randomized controlled trials include minimizing tethers such as telemetry leads and indwelling catheters, minimizing physical restraints, and promoting normal sleep-wake cycles. Providing adequate lighting, frequent reorientation, and using assistive devices (hearing aids, glasses) can also help reduce the risk of delirium. Urging patients out of bed and normalizing their daily routine is recommended. Avoiding

exposure to potentially inappropriate medications is important, and the Beers list of potentially inappropriate medications and the STOPP instrument provide guidance regarding which medications should be avoided.^{5,25–29} In patients with hip fractures, geriatrics consultation and adequate analgesia has been shown to reduce the incidence of delirium.^{26,30}

Prophylactic administration of antipsychotics or cholinesterase inhibitors (eg, donepezil) has not been found to reduce the incidence of delirium, and is not recommended.³¹ Although small studies of melatonin administration and delirium suggest that melatonin may be an effective preventive option, further randomized controlled trials are needed before this becomes the standard of care.³²

PERFORMANCE IMPROVEMENT

1. *What is the cost of delirium?*

It is estimated that the daily cost of hospitalized patients with delirium is 2.5 times as much as a patient without delirium. The yearly burden of delirium on the health care system reportedly ranges from \$38 billion to \$152 billion.³³ Thirty to 40% of cases of delirium are believed to be preventable.⁴

2. *What websites provide tools for delirium prevention?*

The Agency for Healthcare Research and Quality (AHRQ) recommends the implementation of delirium-screening protocols and use of a trained health care professional to diagnose delirium.³⁴ The NICE provides an audit available for download that facilitates compliance with guidelines (<http://guidance.nice.org.uk/CG103/AuditSupport/doc/English>).

The national Hospital Elder Life Program (HELP) is a protocol designed to help hospitals prevent patients from developing delirium by minimizing deliriogenic factors such as lack of mobility, hunger, and pain. Assessing an elderly patient's functional status on admission and identifying patients who are at risk for falls is another technique that has been found to improve performance measures in high-risk events including development of delirium (www.hospitalelderlifeprogram.org/).

Comprehensive Geriatric Assessment is a tool for nursing staff that risk-stratifies patients based on baseline competency in activities of daily living that can be used to identify risk factors for delirium (http://www.siog.org/images/SIOG_documents/cga_practice_guideline_wildiers_jul2011.pdf).

CLINICAL GUIDELINES

In Great Britain, the NICE has published guidelines on diagnosing, preventing, and managing patients with delirium, available at <http://www.nice.org.uk/guidance/CG103>.

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