

How to Diagnose, Prevent, and Manage Delirium

Learning Objectives

- 1) Understand the definition of delirium and recognize the signs and symptoms of the disorder
- 2) Demonstrate an understanding of the pathophysiology of delirium
- 3) Demonstrate knowledge of the most common etiologies of delirium and medical workup to evaluate for these etiologies
- 4) Describe a treatment approach for the management of delirium, including nonpharmacologic and pharmacologic strategies

Step 1: Familiarize oneself with the definition of delirium, including the signs and symptoms of delirium.

- Delirium is defined in the DSM-5-TR as an acute fluctuating disturbance of attention and awareness best explained by an underlying medical condition or combination of conditions.
- Five key signs and symptoms of delirium:
 1. Disturbance in attention (reduced ability to direct, focus, sustain, and shift attention) and awareness
 2. The disturbance develops over a short period of time (usually hours to days), represents a change from baseline, and tends to fluctuate during the course of the day
 3. An additional disturbance in cognition (memory deficit, disorientation, language, visuospatial ability, or perception)
 4. The disturbances are not better explained by another preexisting, evolving, or established neurocognitive disorder, and do not occur in the context of a severely reduced level of arousal, such as coma
 5. There is evidence from the history, physical examination, or laboratory findings that the disturbance is caused by a medical condition, substance intoxication or withdrawal, or medication side effect
- Delirium can have effects on affect, behavior and cognition, the “ABCs of delirium”:
 - Affect (anxiety, paranoia, depression, apathy, irritability, personality changes)
 - Behavior (psychomotor disturbances, hyperactivity, hypoactivity, restlessness)
 - Cognition (*see above*)

Step 2: Know the basic pathophysiology of delirium

- Delirium is characterized by a widespread disturbance of neural networks
- Neurochemically, the principle disturbances that are linked to delirium involve reduced cholinergic function and excess dopaminergic activity
- Delirium reflects complex interactions between:
 1. Direct brain insults including those caused by hypoxia, hypoglycemia, hyponatremia, stroke, trauma, and drug effects
 2. Abnormal or exaggerated stress response from peripheral disturbances
 3. Neuroinflammatory mechanisms such as elevated cortisol levels or elevated levels of proinflammatory cytokines

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Step 3: Investigate potential causes of delirium and complete medical work up to evaluate for these etiologies

- Delirium has a wide variety of etiologies which may occur alone or in combination
- No clear cause has been found in approximately 10% of cases
- Once delirium is identified, a thorough search for underlying causes must be conducted with a complete medical work up

Table 1. Selected etiologies of delirium and examples with suggested work up

Etiology	Examples	Work Up
Drug intoxication or withdrawal	Alcohol Sedative-hypnotics Psychostimulants Hallucinogens	Urine drug screen Thiamine supplementation (recommend not waiting for blood level to treat if clinical suspicion)
Metabolic and endocrine disturbances	Hyponatremia Ammonemia Uremia Hypothyroidism Vitamin deficiencies	Metabolic panel Liver function tests Complete blood count Urinalysis Thyroid-stimulating hormone Vitamin B12 Folate Ammonia Cortisol
Trauma	Traumatic brain injury Subdural hematoma	Neuroimaging Electroencephalogram (EEG)
Infection	Meningitis Neurosyphilis HIV Bacteremia Fungal infections	HIV serology RPR serology Cerebral spinal fluid analysis
Cerebrovascular	Stroke Subarachnoid hemorrhage Seizures	Neuroimaging Electroencephalogram (EEG)
Autoimmune	CNS vasculitis Systemic lupus erythematosus	CRP ESR Autoimmune antibodies
Cardiac	Heart failure Endocarditis	Echocardiogram Cardiac enzymes EKG
Other	Prescription medication effects Post-operative state Disseminated intravascular coagulation (DIC) Hyperthermia or hypothermia	Serum drug levels

Step 4: Develop a treatment plan, including nonpharmacologic and pharmacologic strategies, for the prevention and management of delirium

- Key Strategies:
 - Recognize delirium, treat underlying condition, and decrease additional risk factors that may contribute to delirium
 - Prevent injury to patient and staff

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- ABCDEF bundle: critical care guidelines for optimizing ICU care and outcomes
 - Assess, Prevent, and Manage Pain, Both Spontaneous Awakening Trials (SAT) and Spontaneous Breathing Trials (SBT), Choice of analgesia and sedation, Delirium: Assess, Prevent, and Manage, Early mobility and Exercise, and Family engagement and empowerment

Table 2 Nonpharmacologic and Pharmacologic Management of Delirium

Nonpharmacologic	Pharmacologic
Nonpharmacologic strategies for prevention and treatment of delirium include environmental and behavioral modification Prevention ● Cognitive impairment/disorientation-provide appropriate lighting, clock, calendar ● Hypoxia-optimize oxygen saturation ● Immobility-encourage mobilization ● Multiple medications-review medications and minimize polypharmacy if possible ● Infection-look for and treat infection, avoid unnecessary catheters ● Sleep disturbance-avoid disruptions during sleeping hours ● Dehydration or constipation-adequate fluid intake ● Pain-assess for and treat pain appropriately ● Poor nutrition-provide appropriate nutrition, ensure dentures fit properly ● Sensory impairment-provide hearing aids, glasses Treatment ● Provide supportive care including hydration, nutrition, and pain management ● Early mobilization-this has been the only intervention shown to decrease length of stay in the ICU ● Provide frequent orientation ● Minimize physical restraints and utilize the least restrictive monitoring possible (e.g., sitters or patient safety monitors). ● Include cues to make the environment more familiar (e.g., include pictures and favorite objects from home) ● Maintain patient's sleep-wake cycle and limit overnight sleep interruptions ● Maintain staff continuity and minimize transfers within the hospital	No FDA approved medications for prevention or treatment of delirium Antipsychotics ● High potency ● Low potency ○ Monitor QTc for prolongation Anticonvulsants ● Valproic acid Other ● Alpha-agonists ○ Dexmedetomidine ○ Clonidine ○ Guanfacine ● Melatonin and melatonin agonists ● Benzodiazepines *Avoid anticholinergic medications if possibly

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