Overview of Delirium in the Hospital

Delirium is a common and serious acute neuropsychiatric syndrome characterized by a rapid onset of altered mental status, inattention, and fluctuating levels of consciousness. It is highly prevalent in hospitalized patients, affecting 20-50% of elderly inpatients and up to 80% of ICU patients (StatPearls, 2025). Delirium increases hospital length of stay, morbidity, and mortality, with a 1-year mortality rate of 35-40% in affected patients. Hospitalists play a critical role in early recognition, identifying underlying causes, implementing preventive strategies, and managing delirium to improve patient outcomes. This guide provides a comprehensive overview of delirium in the hospital, including clinical presentation, pathophysiology, diagnostic studies, complications, causes, treatment strategies, hospitalist implications, and includes tables and clinical scenarios for practical application.

Pathophysiology

- Mechanism:
  - Delirium results from a complex interplay of neurotransmitter imbalances (e.g., acetylcholine deficiency, dopamine excess), neuroinflammation, and cerebral hypoperfusion.
- Inflammatory Response:
  - Systemic inflammation (e.g., from infection, surgery) releases cytokines (IL-1, IL-6, TNF-α), disrupting the blood-brain barrier and causing neuronal dysfunction.
- Neurotransmitter Dysregulation:
  - Decreased acetylcholine (e.g., anticholinergic drugs) and increased dopamine (e.g., levodopa) impair attention and cognition.
- Hypoperfusion/Oxidative Stress:
  - Hypoxia, hypotension, or metabolic derangements (e.g., hypoglycemia, hyponatremia) reduce cerebral oxygen delivery, contributing to altered mental status.
- Types:
  - **Hyperactive:** Agitation, hallucinations (20-30% of cases).
  - **Hypoactive:** Lethargy, inattention (50-60%, often missed).
  - **Mixed:** Fluctuating between hyperactive and hypoactive (20-30%).

Causes and Risk Factors

- Predisposing Factors:
  - **Age:** >65 years (highest risk).
  - **Cognitive Impairment:** Dementia, prior delirium (2-3x risk).
  - **Comorbidities:** Frailty, CKD, liver disease, vision/hearing impairment.
- Precipitating Factors:
  - **Infections:** Pneumonia, UTI, sepsis (30-50% of cases).
  - **Medications:** Anticholinergics (e.g., diphenhydramine), benzodiazepines, opioids, polypharmacy.
  - **Metabolic:** Hypoglycemia, hyponatremia, hypercalcemia, uremia.
  - **Neurologic:** Stroke, seizure, subdural hematoma.
  - **Environmental:** ICU setting, sleep deprivation, restraints, lack of sensory aids.
  - **Other:** Surgery (post-op delirium, 10-60% incidence), alcohol/drug withdrawal, pain, dehydration.

Clinical Presentation

- Symptoms:
  - **Inattention:** Difficulty focusing, easily distracted (hallmark feature).
  - **Altered Consciousness:** Fluctuating levels (e.g., alert to drowsy within hours).
  - **Cognitive Changes:** Disorientation, memory deficits, disorganized thinking.
- Behavioral Changes:
  - **Hyperactive:** Agitation, restlessness, hallucinations (visual/auditory).
  - **Hypoactive:** Lethargy, slowed responses, withdrawal.
  - **Mixed:** Alternating agitation and lethargy.
- Physical Exam:
  - **Vitals:** Fever (infection), tachycardia (pain, withdrawal), hypoxia (pneumonia).
  - **Neurologic:** Fluctuating mental status, impaired attention (e.g., unable to recite months backward), tremor (withdrawal).
  - **General:** Dehydration (dry mucous membranes), signs of infection (e.g., lung crackles, CVA tenderness).

Diagnostic Studies

- Screening Tools:
  - **Confusion Assessment Method (CAM):** Gold standard, requires:
    - Acute onset and fluctuating course.
    - Inattention.
    - Disorganized thinking OR altered level of consciousness.
- Labs:
  - **CBC:** Leukocytosis/leukopenia (infection), anemia (chronic disease).
  - **CMP:** Glucose (hypo/hyperglycemia), Na+ (hyponatremia), Ca2+ (hypercalcemia), BUN/Cr (uremia).
  - **Urinalysis/Culture:** UTI (pyuria, bacteriuria).
  - **Blood Cultures:** If sepsis suspected.
  - **Lactate:** >2 mmol/L (sepsis, hypoperfusion).
  - **Thyroid Function:** TSH (hypo/hyperthyroidism).
  - **Toxicology Screen:** Drugs of abuse, medication overdose (e.g., benzodiazepine).
- Imaging:
  - **CXR:** Pneumonia, pulmonary edema (CHF as delirium trigger).
  - **CT Head:** Stroke, hemorrhage, mass (if focal neurologic signs).
  - **MRI Brain:** Rarely needed, for ischemic stroke or encephalitis.
- Other Tests:
  - **EEG:** Diffuse slowing (delirium), focal seizures (if suspected).
  - **Lumbar Puncture:** If meningitis/encephalitis suspected (e.g., fever, neck stiffness, CSF: elevated WBC, low glucose).
  - **ABG:** Hypoxemia (PaO2 <60 mmHg), hypercapnia (PaCO2 >45 mmHg, respiratory failure).

Complications

- **Prolonged Hospital Stay:** Increases LOS by 5-10 days on average.
- **Functional Decline:** 30-50% incidence, higher risk of nursing home placement.
- **Cognitive Decline:** 20-40% develop persistent cognitive impairment (post-delirium dementia).
- **Increased Mortality:** 1-year mortality 35-40%, 2x risk in elderly.
- **Falls/Injuries:** 10-20% incidence, due to agitation or lethargy.
- **Aspiration Pneumonia:** 5-10% incidence, especially in hypoactive delirium.

Treatment Strategies

- Non-Pharmacologic (First-Line):
- Prevention (HELP Program):
    - **Reorientation:** Clocks, calendars, family presence.
    - **Sensory Aids:** Glasses, hearing aids.
    - **Sleep Hygiene:** Minimize nighttime disruptions, dim lights.
    - **Mobility:** Early ambulation, physical therapy.
    - **Hydration/Nutrition:** Ensure adequate intake.
    - **Environment:** Quiet room, avoid restraints, minimize sensory overload.
- Pharmacologic (If Non-Pharmacologic Fails):
    - Hyperactive Delirium:
        - **Haloperidol:** 0.5-1 mg IV/PO q2-4h PRN (max 5 mg/day in elderly), avoid in Parkinson's (worsens symptoms).
        - **Risperidone:** 0.25-0.5 mg PO q12h (alternative, less EPS risk).
    - Hypoactive Delirium:
        - Avoid antipsychotics unless severe distress; focus on non-pharmacologic measures.
        - Underlying Cause:
            - **Infections:** Antibiotics (e.g., ceftriaxone 1 g IV daily for UTI/pneumonia).
            - **Metabolic:** Correct glucose (D50 for hypoglycemia), Na+ (3% saline for severe hyponatremia), fluids (NS 1 L for dehydration).
            - **Withdrawal:** Lorazepam 1-2 mg IV q4h (alcohol withdrawal), methadone for opioid withdrawal.
        - Duration:
            - Use antipsychotics short-term (days), reassess daily, taper off as delirium resolves.
    - Supportive Care:
        - **Pain Management:** Acetaminophen 650 mg PO q6h (avoid NSAIDs, bleeding risk).
        - **Monitoring:** CAM qshift, vitals q4h, labs q12-24h (e.g., glucose, Na+).

Hospital Medicine Implications

- Early Recognition:
    - Screen all elderly/ICU patients daily with CAM or 4AT.

    - Suspect delirium in any patient with acute mental status change, especially with risk factors (e.g., dementia, infection).
- Consultations:
    - **Geriatrics:** For elderly patients, polypharmacy review.
    - **Neurology:** If stroke, seizure, or EEG needed.
    - **ID:** For infection management (e.g., sepsis, meningitis).
    - **Psychiatry:** For persistent hallucinations, underlying psychiatric conditions.
- Monitoring:
    - **Vitals q4h** (fever, tachycardia, hypoxia).
    - **CAM qshift** (assess resolution).
    - **Labs q12-24h** (WBC, glucose, Na+, Cr).
- Discharge Planning:
    - **Medications:** Taper antipsychotics, optimize chronic meds.
    - **Follow-Up:** Geriatrics, neurology, primary care within 1 week.
    - **Education:** Family on recurrence risk, home safety (e.g., fall prevention).

Table: Delirium in the Hospital - Key Features

Aspect	Hyperactive Delirium	Hypoactive Delirium	Mixed Delirium	Diagnostic Tests	Treatment
Presentation	Agitation, hallucinations	Lethargy, inattention	Fluctuating agitation/ lethargy	CAM, 4AT, labs (CBC, CMP)	Non-pharmacologic, haloperidol
Pathophysiology	Dopamine excess, inflammation	Acetylcholine deficiency, hypoperfusion	Combined mechanisms	CT head (stroke), EEG (slowing)	Treat underlying cause (e.g., antibiotics)
Labs	WBC >12,000/ µL (infection)	Glucose <70 mg/dL, Na+ <130 mEq/L	Lactate >2 mmol/L (sepsis)	UA/culture (UTI), blood cultures	Correct metabolic (e.g., glucose, Na+)
Complications	Falls, prolonged LOS	Aspiration, cognitive decline	Increased mortality (35-40%)	Monitor vitals, CAM qshift	Supportive (hydration, mobility)

Table: Hospitalist Management Checklist for Delirium

Task	Hyperactive Delirium	Hypoactive Delirium	Monitoring	Consults	Follow-Up
Initial Diagnosis	CAM, assess triggers	CAM, rule out metabolic	Vitals q4h, CAM qshift	Geriatrics, neurology	Primary care

Task	Hyperactive Delirium	Hypoactive Delirium	Monitoring	Consults	Follow-Up
Non-Pharmacologic	Reorientation, quiet room	Sensory aids, mobility	Sleep hygiene, hydration	ID (infection), psychiatry	Geriatrics
Pharmacologic	Haloperidol 0.5 mg IV PRN	Avoid unless distress	Labs q12h (WBC, Na+)	Neurology (stroke), ID	Psychiatry
Supportive Care	Avoid restraints, family presence	Pain control, nutrition	Monitor falls, aspiration	Geriatrics (polypharmacy)	Home safety

Clinical Scenarios

Scenario 1: Elderly Male with Hyperactive Delirium Post-Surgery

- Presentation: A 75-year-old male with dementia, 2 days post-hip surgery, becomes agitated and hallucinates (seeing “people in the room”). Exam shows T 38°C, BP 130/80 mmHg, HR 100 bpm, RR 20/min, GCS 14, disoriented, pulling at lines.
- Diagnostic Workup: **CAM:** Positive (inattention, disorganized thinking), UA: Pyuria, culture: E. coli, labs: WBC 14,000/µL, Cr 1.5 mg/dL (baseline 1.0), glucose 90 mg/dL, CXR: Normal.
- Diagnosis: Hyperactive delirium (UTI trigger) → Acute agitation, positive CAM, infection.
- Management: **Admit to medicine (delirium). Non-pharmacologic:** Quiet room, family at bedside, reorientation. Start ceftriaxone 1 g IV daily (UTI). Haloperidol 0.5 mg IV q4h PRN (agitation, total 1 mg/day). Monitor CAM qshift, labs q24h. Day 3: CAM negative, afebrile, discharged with primary care follow-up.

Scenario 2: Middle-Aged Female with Hypoactive Delirium in ICU

- Presentation: A 50-year-old female in the ICU for sepsis (pneumonia) becomes lethargic and inattentive on day 3. Exam shows T 37°C, BP 110/70 mmHg, HR 90 bpm, RR 18/min, SpO2 94% on 2 L/min, GCS 13, slowed responses.
- Diagnostic Workup: **CAM:** Positive (inattention, altered consciousness), labs: WBC 12,000/µL, Cr 1.2 mg/dL, glucose 70 mg/dL, Na+ 128 mEq/L, CXR: Improving consolidation, blood cultures: Negative.

- Diagnosis: Hypoactive delirium (sepsis, hyponatremia) → Lethargy, positive CAM, metabolic trigger.
- Management: **Continue ICU care (delirium). Non-pharmacologic:** Sensory aids (glasses), minimize nighttime disruptions. Correct Na+ (3% saline 100 mL IV over 6h, target increase <6 mEq/L in 24h). Avoid antipsychotics (hypoactive). Monitor CAM qshift, Na+ q6h (improves to 134 mEq/L). Day 5: CAM negative, GCS 15, transferred to floor, discharged with pulmonology follow-up.

Scenario 3: Elderly Female with Mixed Delirium from Alcohol Withdrawal

- Presentation: A 70-year-old female admitted for a fall becomes agitated then lethargic over 24h. She has a history of alcohol use. Exam shows T 38.5°C, BP 140/90 mmHg, HR 120 bpm, RR 22/min, GCS 12, tremor, disorientation.
- Diagnostic Workup:**CAM:** Positive (fluctuating, inattention), labs: WBC 10,000/µL, Cr 1.0 mg/dL, glucose 80 mg/dL, Na+ 135 mEq/L, ethanol level undetectable, CIWA-Ar score 15 (moderate withdrawal).
- Diagnosis: Mixed delirium (alcohol withdrawal) → Fluctuating mental status, tremor, CIWA-Ar 15.
- Management: **Admit to telemetry (withdrawal, delirium). Non-pharmacologic:** Quiet room, reorientation. Start lorazepam 1 mg IV q4h (CIWA-Ar >8), thiamine 100 mg IV daily. Monitor CIWA-Ar q4h (decreases to 5 by day 3), CAM qshift. Day 4: CAM negative, no agitation, discharged with addiction medicine follow-up.