

POSTOPERATIVE DELIRIUM

Definition

Delirium is a common and serious altered mental state that may develop due to a wide variety of medical conditions or drug side effects. It is characterized by the following:

1. Acute onset and fluctuating course
2. Inattention
3. Disorganized thinking or a change in cognition
4. Altered level of consciousness.

Using the CAM (Confusion Assessment Method), delirium is most reliably diagnosed by the presence of the first two findings and at least one of the last two. According to the DSM-IV definition, it may also be accompanied by sleep disturbance, lethargy, hypervigilance, agitation, hallucinations, illusions, or emotional disturbances, although these features are not necessary for diagnosis.^{1,2} The pathogenesis of delirium is poorly understood and most likely multifactorial.³

Incidence

Delirium may occur in up to 70% of post-surgery patients⁴, but the incidence varies widely with the type of surgery and underlying population. Meta-analyses have produced the following estimates of incidence:

Type of Surgery/Reason for Admission	Incidence of Delirium
Hip fracture ⁵	21.7% (4% to 53%)
Elective hip or knee replacement ⁵	12.1% (9% to 28%)
Cardiac surgery ⁶	32% (0% to 73%)
Major elective surgery ^{1,2}	10% (9% to 17%)
Elective vascular surgery ^{1,2}	34.5% (29% to 39%)
ICU care (surgical & medical patients >65yo) ³	70% to 87%

Cardio-pulmonary bypass is a notable surgery-specific risk factor for delirium that may be associated with more protracted or even permanent cognitive dysfunction, but studies in this area are heterogeneous. If an off-pump surgery is possible, it may reduce the risk of postop delirium.

Risk Factors

In addition to the type of surgery, certain patient populations are inherently vulnerable to developing delirium. Risk factors include^{1,2}:

Age>65	Cognitive dysfunction, especially dementia
Prior stroke	Prior history of delirium
Depression	Reduced preoperative functional status
Vision and hearing impairment	Preoperative psychotropic drug use
HIV	Drug and alcohol abuse
Renal or liver disease	Male gender
Malnutrition	

Precipitating Etiologies

Postoperatively, many medications and medical conditions can contribute to the development of delirium. Although the following list is not comprehensive, consider the following common precipitants:

Medications: Sedative-hypnotics, barbiturates, alcohol, antidepressants, anticholinergics, opioid analgesics, antipsychotics, anticonvulsants, antihistamines, corticosteroids, fluoroquinolones, and anti-Parkinsonian agents. Also be wary of polypharmacy. **Please

Other Topics

refer to the second page of the UW Delirium Protocol for a comprehensive list and substitution alternatives**

Acute medical conditions: Fluid and electrolyte abnormalities (sodium, glucose, calcium), uremia, uncontrolled pain, hypoxemia, hypercarbia, fever, hypotension, anemia, infections (UTI, pneumonia, line infections), myocardial infarction, alcohol and drug withdrawal, constipation, and urinary retention.

Iatrogenic: sleep cycle disruption, catheters and other “tethers” (IV lines, ECG leads, and restraints), lack of access to hearing aids, interpreter services, glasses, food, and water.

Diagnosis

First confirm the diagnosis of delirium by excluding other neurologic and psychiatric conditions. Focus on identifying precipitants with history, medication review, physical exam (particularly neurologic and cognitive exam), and basic lab tests (CBC, Chem7, UA). When appropriate, EKG, CXR, drug levels, or a toxin screen may confirm a suspected etiology. Remember that the etiology may be multifactorial. Head CT scan is often not helpful unless there is a risk factor for intracranial bleed (e.g. history of fall, anticoagulant medicines) or evidence of focal neurologic impairment.

Screening and Prevention

Identifying patients at risk for delirium should be a priority in the preoperative evaluation and during inpatient consults. Screening tools include:

Cardiac Surgery Delirium Prediction Score⁷:

Risk Factor	Points
Prior CVA or TIA	1
MMSE ≤ 23	2
MMSE 24-27	1
Albumin ≤ 3.5	1
Depression (Geriatric Depression Scale > 4)	1

Total Points	Incidence of Delirium
0	19%
1	45%
2	62%
≥3	87%

General Elective Surgery Delirium Prediction Score⁸:

Risk Factor	Points
Age > 70	1
Dementia (TICS<30)	1
Self reported alcohol abuse	1
Functional dependence (SAS class IV)	1
Aortic operation	2
Noncardiac thoracic surgery	1
One or more abnormal labs (K <3.0 or >6.0, Na <130 or >150, or glucose <60 or >300)	1
TICS = Telephone Interview for Cognitive Status, a variant of MMSE	
SAS = Self Assessment of functional Status	

Total Points	Incidence of Delirium
0	2%
1	8%
2	13%
≥3	50%

It is worth noting that these prediction rules have relatively good specificity (80-90%), but mediocre sensitivity (~50%). Thus, they cannot be used to exclude the possibility of delirium developing after an operation.

Prevention trials utilizing behavioral and environmental approaches have demonstrated a reduction in delirium incidence (ARR 5%⁹ to 18%)¹⁰. Pharmacologic prevention trials in high-risk patients have not shown any reduction in delirium incidence, but may affect duration and severity. In the absence of better data, prophylactic antipsychotics are not warranted.¹¹

Effective prevention tools include:

- Providing visual and hearing aids when appropriate
- Early mobilization
- Avoid volume depletion and electrolyte abnormalities
- Discontinue or substitute high risk medications

Frequent reorientation
Maintain day/night cycle by limiting naps, opening blinds, avoiding nighttime interruptions

Treatment

Delirium is typically reversible if the precipitating factors are addressed. Identifying and treating underlying causes of delirium is essential for recovery. Simultaneously, consider ways to provide supportive care and, if necessary, manage behavioral symptoms.

<p>Supportive Care: <i>Delirium can lead to injury or irreversible functional decline. Attention to such sequelae includes the following steps:</i></p>	<p>Optimize nutrition Mobilize frequently to prevent pressure ulcers and functional decline Prevent aspiration with head of bed precautions when appropriate Optimize bowel regimen Fall and wander precautions when appropriate</p>
<p>Behavioral Control: <i>The first principle of behavioral management is to utilize environmental or social measures rather than pharmacologic or physical restraints whenever possible.</i></p>	<p>Frequent orientation, including posting of calendar and clock Involve family to provide familiar context Maintain night/day cycle Constant observer or wander guard Consider securing or protecting vulnerable lines, drains, and wounds from harmful manipulation</p>
<p>Pharmacologic Treatment <i>If behavioral interventions fail or agitated delirium is life-threatening (such as in the ICU), consider:</i></p>	<p>Low-dose haloperidol (0.5 to 1 mg po/IM qhs + 0.5 to 1 mg po/IM q4 hrs prn, not to exceed 5 mg/day). Risperidone (0.5 mg po q12 hrs prn) is an acceptable alternative.</p> <p>Recall that these are contraindicated in patients with neuroleptic malignant syndrome, prolonged QTc, or Parkinsonism. Reassess behavior frequently and stop the antipsychotic medication a few days after delirium has resolved. Benzodiazepines often worsen confusion and sedation and should typically be avoided for behavior management.</p>

At the University of Washington, please refer to the Delirium Assessment & Treatment Order Form (accessible online at https://know1.mcis.washington.edu/Document/forms/forms_images/UH2360.pdf? UWNetID restricted)

Outcomes: Perioperative delirium is associated with greater cost, longer length of stay, greater morbidity, increased likelihood of subsequent institutionalization, and mortality.¹²

References

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