# Prevention and management of delirium in hospital

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## Abstract

Delirium is a geriatric syndrome. Its prevalence is ranging from 20-70% in hospitalised patients in different clinical settings. Incident delirium is commonly seen among post-surgical and critical care patients. Identification of vulnerable patients and avoiding precipitants is paramount in prevention. Proactive screening of them with a validated tool at different points during the hospital stay helps early identification of delirium. Treating the underlying condition which triggered it, and multi-domain non-pharmacological interventions are an essential part of the management of established delirium. Enhancing the competencies of health care professionals and development and validation of local delirium care pathways in the local set-up are essential steps in achieving better patient outcomes.


**Key words:** delirium, predisposing and precipitating factors for delirium, management of delirium

## Introduction

The term 'delirium' originated from the Latin word '*delirare*' which means 'to go out of the furrow', a deviation from a straight line or derangement.[1] It is a syndrome of acute brain failure due to direct pathophysiological consequences of an underlying medical condition or a toxic exposure.[2]

Delirium is a medical emergency with significant short and long-term morbidity such as loss of physical function and increased risk of falls leading to dependence. It also leads to increased length of hospital stay and risk of institutionalization increasing the healthcare expenditure.[2,3] Furthermore, delirious patients have an increased risk of mortality.[3] Additionally, it also gives rise to a high caregiver burden with significant distress to patients and their families. Thus, the identification of patients at risk for delirium and implementing preventative strategies, as well as recognizing patients in early delirium is of paramount

### Key points

1. Delirium is a frailty syndrome which has numerous predisposing and precipitating factors for its development.
2. It is a clinical diagnosis and Confusion Assessment Method (CAM) is a screening tool that aids clinicians to confirm its presence.
3. Identifying the disorder and underlying illness and correcting them are paramount in management.
4. Non-pharmacological interventions are the first line in both prevention and management.
5. No conclusive evidence to recommend a pharmacological agent to be used either in prevention or management. However, antipsychotics are used as the first-line agent in agitated delirious patients to relieve their distress and prevent harm to them.

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importance to achieve good patient outcomes. This article aims to provide guidance on the early detection, diagnosis, prevention, and management of delirium.

## Epidemiology

The incidence and prevalence of delirium vary among different hospital settings. A meta-analysis of 33 studies in 2020 revealed an overall prevalence of delirium of 33% in medical inpatients.[4] There is a significant burden in postoperative surgical settings where the prevalence of delirium is ≥20% in high-risk patients undergoing major surgery.[5] Critical care settings report the highest percentage of prevalence of delirium ranging from 30-70% in ventilated and non-ventilated patients.[5] A Sri Lankan study conducted on ventilated patients in a surgical intensive care unit observed the presence of delirium in 66.6% of patients.[6] These figures highlight that delirium is highly prevalent among hospitalized patients and it should be brought to the attention of medical teams.

## Clinical features and diagnosis

According to the Diagnostic and Statistical Manual (DSM)-5 of the American Psychiatric Association, delirium is a disturbance in attention and awareness from the patient's baseline level which develops over a short period of time (hours to a few days) and fluctuates in severity during the course of a day. Typically becoming more severe in the evening and night is known commonly as the sundowning effect. An additional disturbance in one of the cognitive domains such as memory, orientation, language, visuospatial function, or perception (hallucinations or misperceptions) should be present to diagnose delirium. Importantly, there should be evidence of a medical condition, exposure to a toxin or substance intoxication or withdrawal causing the cognitive disturbance and should not be explained by a pre-existing, established or evolving neurocognitive disorder.[7] There could be a wide range of clinical features of delirium such as psychomotor disturbances, altered sleep-wake cycle, emotional variability, etc.[2]

The three subtypes of delirium classified according to the psychomotor disturbances are hyperactive, hypoactive and mixed delirium.[2] Patients with hyperactive delirium are easily recognizable as they demonstrate psychomotor agitation, restlessness and emotional lability. They are hyper-vigilant, restless, easily startled, irritable and distractible. Their speech is fast, loud and tangential and they have fast motor responses. Often, the ward staff and other patients are disturbed by their behaviour and the diagnosis of delirium is almost never missed.

On the contrary, hypoactive delirium is often undiagnosed in busy wards and misdiagnosed as depression.[2] The clinical features of hypoactive delirium include psychomotor retardation (slowed movements or reduced activity), lethargy and decreased level of responsiveness and alertness/ awareness. They show apathy, sparse or slow speech and are often withdrawn and have hyper-somnolence. Mixed delirium illustrates alternating features of both.

As delirium is a clinical diagnosis, a thorough clinical assessment is the key to identifying delirium. Recognizing that delirium is present and uncovering the precipitating factors are two important aspects of the diagnostic evaluation. However, establishing the diagnosis of delirium is challenging due to many factors. Fluctuating nature of the illness, the behaviour of the patient, lack of awareness and expertise among medical staff, and unavailability of relatives to get information on baseline cognitive level and a co-lateral history are some of them.[2]

There are multiple validated delirium screening tools with high sensitivity and specificity developed for healthcare professionals to use in different healthcare settings. The Confusion Assessment Method (CAM) could be used in medical and surgical wards with a sensitivity of 94-100% and a specificity of 90-95% for the diagnosis of delirium.[8] It can be incorporated into routine bedside evaluation and takes five minutes to administer. There are several other CAM-based tools such as 3D-CAM, brief CAM and CAM-ICU which could be administered in different clinical settings including emergency department (brief CAM) and critical care setting (CAM-ICU).[5] The 4 A's test (4AT) is another commonly used rapid screening tool which could be easily administered in general hospital settings with a sensitivity of 89.7% and specificity of 84.1% for delirium.[9] The Intensive Care Delirium Screening Checklist (ICDSC) is another validated screening tool for critical care settings.[5] Though, none of the screening tools has been validated in Sri Lanka, with available evidence the CAM score could be recommended to be used as a bedside instrument for the detection of delirium in adult patients.

## Identification of high-risk patients

There are several predisposing factors which increase a patient's vulnerability to delirium.[5]

They are summarized:

**Predisposing factors for the development of delirium**

- Socio-demographic variables: advanced age (older than 65 years), male gender, institutionalization, social isolation
- Poor functional level: immobility and physical dependence
- Underlying brain diseases: dementia, stroke, Parkinson disease
- Frailty
- Co-morbidities: lung, liver, kidney, heart disease or terminal illness
- Chronic pain
- Polypharmacy
- Sensory impairment: visual and hearing impairment
- Psychiatric illnesses: depression
- Alcohol misuse
- Malnutrition
- History of delirium

Furthermore, there are numerous precipitating factors which could contribute to the development of delirium.[5,10] These factors are illustrated below.

**Precipitating factors for delirium**

- Infections
- Poor pain management
- Metabolic disturbances: electrolyte imbalance, hypo/hyperglycaemia, acid/base imbalance, liver or renal failure
- Constipation or urinary retention
- Medications: benzodiazepines, anticholinergic agents, opioids, antipsychotics
- Alcohol/ toxins: use or withdrawal
- Physical restraints: urinary catheters, intravenous lines, etc.
- Severe medical illness (high APACHE – II score)
- Hypotension, hypoxia, ischaemia (stroke, myocardial infarction)
- Trauma: fractures, head injury
- Surgery: the type of surgery (hip replacement/ neurosurgery), type of anaesthesia, emergency surgery
- Sleep deprivation: inappropriate noise and lighting
- Dehydration
- Psychological stress and changes in the environment/ healthcare staff and caregivers
- Immobility

Often, the predisposing and precipitating factors for delirium are multifactorial. When there are a significant number of predisposing factors, even a very minor precipitating factor could trigger delirium.[5] This is the reason that the elderly population is particularly affected. Therefore, it is imperative to proactively screen for delirium in high-risk patients at different points such as on admission, after surgery, etc. Delirium risk prediction models have been developed and are still an area of ongoing research.[2]

**Prevention of delirium**

The most effective strategy to minimize delirium-related negative consequences is the prevention of its occurrence.[2] Multi-component, multi-disciplinary interventions have been shown to reduce the risk of incidence of delirium in at-risk patients. The Hospital Elder Life Program (HELP) focused on the prevention of delirium in hospitalized older adults (≥70 years) by instituting a multimodal intervention by an interdisciplinary team consisting of a geriatrician, geriatric nurse specialist, therapeutic-recreation specialist, physical therapist and trained volunteers aiming at six risk factors for delirium.[11] The preventive strategies used were orientation, cognitive stimulating activities, sleep enhancement, early mobilization, correcting vision and hearing impairment and early recognition of dehydration and volume repletion which demonstrated a significant reduction in duration and the total number of delirium episodes in the intervention group ($p<0.05$).[11] It has been implemented in different parts of the world with successful outcomes. A recent meta-analysis revealed a significant reduction in incidence of delirium and falls rate ($p<0.05$) leading to a greater cost-saving in healthcare.[12]

Addressing the precipitating factors such as reducing noise and light exposure in the night to facilitate physiological sleep, minimizing physical restraints, early mobilization, appropriate management of pain, preventing and relieving constipation and urinary retention, medication review, optimization of nutrition, educating caregivers and early identification and treatment of postoperative complications by a multidisciplinary team are effective measures shown to prevent delirium.[2,5,13]

There is no conclusive evidence favouring the use of medications such as antipsychotics, cholinesterase inhibitors, dexmedetomidine (alpha-2 agonist), melatonin and melatonin receptor agonists in the prevention of delirium.[2,5]

## Management of delirium

The cornerstone of the management of delirium is the identification of causes and correcting them. Clinical history including medication review and physical examination coupled with investigations would help to identify the precipitating factors. Blood and radiological investigations should be targeted to identify infections, metabolic disturbances, ischaemia, etc.[5] If a primary central nervous system disorder is suspected neuroimaging, electroencephalography and lumbar puncture are indicated.[5]

Multi-domain strategies consisting of non-pharmacological and pharmacological methods implemented by a multidisciplinary team are important when managing a patient with established delirium.[5] The non-pharmacological interventions are the same as the preventive strategies and they should be used as the first line of management. Even though the evidence for these interventions is lacking in treating delirium compared to prevention,[14] they are widely implemented due to their relative safety. Staff education and family empowerment and engagement are pivotal in managing delirium. Additionally, delirium-related complications such as immobility, falls, pressure ulcers, malnourishment, dehydration, aspiration and isolation should be prevented.[13]

Routine administration of pharmacological agents are not recommended. They should be reserved for severe distress or to prevent harm to the patient or others when non-pharmacological interventions have failed.[5] Antipsychotic medications are often used as the first line. However, their efficacy in the treatment of delirium is controversial. A recent Cochrane review of antipsychotics for the treatment of delirium revealed there is no effect on severity of delirium, resolution of symptoms or mortality.[15] Another meta-analysis demonstrated no significant effect on delirium incidence, duration, severity, length of stay or mortality.[16] Thus, they are recommended in the lowest effective as-needed doses for the shortest duration to manage high-distress symptoms such as severe agitation and psychosis with cautious monitoring.[2] For instance, intramuscular haloperidol 0.5 to 1 mg could be administered as needed.[2] There is no consistent evidence to support the use of cholinesterase inhibitors, melatonin and its receptor agonists and alpha-2 agonists to treat delirium.[2,5]

## Summary

Delirium is a common and serious medical condition with significant mortality and morbidity particularly affecting the elderly population. Screening at-risk individuals and early implementation of simple preventive strategies make a significant impact on improving outcomes.

## Author declaration

### Conflicts of interest

The authors have no conflicts of interest to declare.

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