Chapter 15
Management of Delirium in the ICU

15.1 Introduction

Delirium is a frequent and severe condition in the intensive care unit (ICU), marked by sudden disturbances in attention and cognition. It significantly worsens patient outcomes, including extended ICU stays, higher mortality, and potential long-term cognitive impairment. Delirium management in the ICU requires a comprehensive strategy that incorporates early detection, addressing reversible causes, and the judicious use of both non-pharmacologic and pharmacologic treatments [1, 2] (Ref. Algorithm 15.1).

15.2 Delirium Screening

Purpose: Early identification is essential to mitigate the effects of delirium.
Tools:

- Confusion Assessment Method for the ICU (CAM-ICU): Detects delirium by evaluating acute onset, inattention, altered consciousness, and disorganized thinking.
- Intensive Care Delirium Screening Checklist (ICDSC): A detailed checklist scoring of eight symptoms to assess delirium.

Frequency: Daily screening is recommended for prompt intervention.

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15.3 Identify and Address Underlying Causes

Comprehensive evaluation should target correctable factors:

- Hypoxia: Ensure proper oxygenation to avoid cognitive disturbances.
- Electrolyte and Metabolic Imbalances: Correct abnormal sodium, magnesium, calcium, urea levels. Also optimize blood sugar levels. Check for thyroid function test, thiamine deficiency, and hepatic encephalopathy.
- Infections: Treat systemic or localized infections, like sepsis or pneumonia.
- Withdrawal: Manage symptoms of alcohol or drug withdrawal carefully.
- Medication Side Effects: Adjust medications that may contribute to delirium, particularly anticholinergics or sedatives.

15.4 Non-pharmacologic Interventions [3]

- Reorientation: Reorient the patient regularly with clocks, calendars, and clear communication.
- Sleep Hygiene: Minimize nighttime noise and light, optimize comfort, and encourage consistent sleep schedules.
- Early Mobility: Promote physical activity early to reduce delirium duration and improve recovery.
- Family Involvement: Engaging family members can provide emotional support and reduce confusion.

15.5 Incorporate Sleep-Promoting Protocol

A sleep-promoting strategy is vital for managing PADIS (pain, agitation/sedation, delirium, immobility, sleep disturbance) in ICU patients. This includes minimizing disruptions during the night and scheduling procedures to allow for prolonged, uninterrupted sleep.

15.6 Multicomponent Intervention Strategy (ABCDEF Bundle)

Adopt the ABCDEF bundle, a proven strategy to reduce delirium duration, ICU stay, and mortality. It focuses on awakening, breathing coordination, sedation choice, delirium monitoring, early mobility, and family involvement.

15.7 Pharmacologic Management

Criteria for Use: Consider pharmacologic interventions only when non-pharmacologic measures fail, and the patient is at risk due to severe agitation or psychosis.

- Haloperidol: For short-term management of severe agitation.
- Atypical Antipsychotics (e.g., Quetiapine): Preferred for longer management with fewer side effects.
- Avoid Benzodiazepines: Except in cases of alcohol or benzodiazepine withdrawal, benzodiazepines should be avoided as they can worsen delirium.

15.8 Ongoing Pharmacologic Therapy Caution

Use haloperidol, atypical antipsychotics, or dexmedetomidine sparingly, ensuring they are reserved for when delirium poses a risk of harm. Monitor closely and reassess treatment regularly.

Delirium Risk Factors

Incorporate risk prediction models like PRE-DELIRIC and E-PRE-DELIRIC to anticipate delirium onset, focusing on modifiable factors such as benzodiazepine use and deep sedation.

1. **PRE-DELIRIC Model**

The PRE-DELIRIC model is a delirium risk prediction tool developed to estimate the likelihood of ICU patients developing delirium within the first 24 h of admission. It uses 10 clinical variables such as age, APACHE-II score, infection, coma, and the use of sedatives like benzodiazepines. The model's aim is to help clinicians identify patients at high risk of delirium early on, allowing for timely preventive measures.

2. **E-PRE-DELIRIC Model**

An updated version of the PRE-DELIRIC model, the E-PRE-DELIRIC (early prediction) model enhances prediction accuracy by incorporating dynamic variables, including changes in vital signs and clinical condition over the initial 24 hours of ICU admission. This model refines risk prediction by continuously monitoring and updating risk factors like sedation depth and benzodiazepine use, offering a more precise prediction of delirium onset during the ICU stay.

Reassessment and Adjustment

- Ongoing Monitoring: Reassess the patient's condition regularly to evaluate progress and adapt the treatment plan accordingly.
- Adjustment of Treatment: Taper or discontinue pharmacologic treatments as the patient's delirium improves, avoiding unnecessary side effects.

15.9 Detailed Overview of ICDSC and CAM-ICU for Delirium Screening

Delirium screening in the ICU is crucial for early identification and management. Two widely used tools for this purpose are the Intensive Care Delirium Screening Checklist (ICDSC) and the Confusion Assessment Method for the ICU (CAM-ICU). Each has unique features and criteria that help clinicians systematically assess and diagnose delirium in critically ill patients.

15.10 Intensive Care Delirium Screening Checklist (ICDSC)

The ICDSC is a checklist-based tool that quantifies delirium symptoms over an assessment period. It is designed to be user-friendly and can be administered by bedside nurses or other healthcare providers.

Components of the ICDSC The ICDSC consists of eight items, each reflecting common features of delirium. Each item is scored based on the presence or absence of the symptom within the past 24 hours.

1. **Altered Level of Consciousness**
   - Any change in consciousness, such as decreased alertness or hyperalert states, should be noted. The Richmond Agitation-Sedation Scale (RASS) is often used to evaluate this.
   - **Score 1 if present**.
2. **Inattention**
   - Difficulty in focusing, maintaining attention, or shifting attention. This may be assessed by tasks like counting backward or spelling a word.
   - **Score 1 if present**.
3. **Disorientation**
   - The patient's lack of awareness of their surroundings, including confusion about time, place, or person.
   - **Score 1 if present**.
4. **Hallucinations or Delusions**
   - The presence of perceptual disturbances such as seeing or hearing things that are not there, or having false beliefs.
   - **Score 1 if present**.

5. **Psychomotor Agitation or Retardation**
   - Changes in activity levels, either increased (agitation) or decreased (retardation).
   - **Score 1 if present**.
6. **Inappropriate Speech or Mood**
   - Incoherent, irrelevant, or illogical speech, or emotional disturbances that are inappropriate to the context.
   - **Score 1 if present**.
7. **Sleep/Wake Cycle Disturbances**
   - Irregular sleep patterns, such as daytime sleepiness or nighttime wakefulness.
   - **Score 1 if present**.
8. **Symptom Fluctuation**
   - Rapid changes in the severity or presence of delirium symptoms over time.
   - **Score 1 if present**.

Scoring
- Each item is scored 0 (absent) or 1 (present).
- A total score is calculated by summing the scores of all items.
- **Interpretation**:
  - A score of 0–3 suggests no or subsyndromal delirium.
  - A score of 4 or more indicates the presence of delirium.

Advantages
- Captures a broad range of delirium symptoms.
- Can be integrated into routine patient care by bedside staff.
- Useful for continuous monitoring and documentation.

15.11 Confusion Assessment Method for the ICU (CAM-ICU)

The CAM-ICU is a structured tool specifically adapted for use in the ICU, where patients may not be able to communicate effectively. It focuses on key diagnostic features of delirium and provides a quick and reliable assessment.

Components of the CAM-ICU The CAM-ICU consists of four features that are evaluated to determine the presence of delirium.

1. **Feature 1: Acute Onset or Fluctuating Course**
   - **Assessment**: Observe for evidence of an acute change in mental status from baseline or fluctuating course of symptoms over the past 24 hours.
   - **Criteria**: This can be established through direct observation, chart review, or communication with the healthcare team.
   - **Result**: No evidence of an acute change in mental status➔ No delirium.
   - If positive, check for feature 2.
2. **Feature 2: Inattention**
   - **Assessment**: Evaluate the patient's ability to focus and maintain attention.
   - **Task**: Ask the patient to squeeze your hand when they hear the letter "A" in a sequence of random letters (e.g., "SAVEAHAART").
   - **Criteria**: An error rate of more than 2 errors in 10 letters indicates inattention.
   - **Result**: 0–2 errors➔ No delirium.
   - >2 errors➔ Check for feature 3.
3. **Feature 3: Altered Level of Consciousness**
   - **Assessment**: Use the RASS to assess the patient's level of consciousness.
   - **Criteria**: Any level other than "alert and calm" (RASS 0) suggests altered consciousness.
   - **Result**: RAAS other than zero➔ Delirium present.
   - RAAS zero ➔Check for feature 4.
4. **Feature 4: Disorganized Thinking**
   - **Assessment**: Ask simple yes/no questions to evaluate the patient's coherence and logical thought processes (e.g., "Will a stone float on water?").
   - **Criteria**: Incorrect answers or the inability to engage coherently indicate disorganized thinking.
   - **Result**: 0–1 error➔ No delirium.
   - >1 error➔ Delirium present.

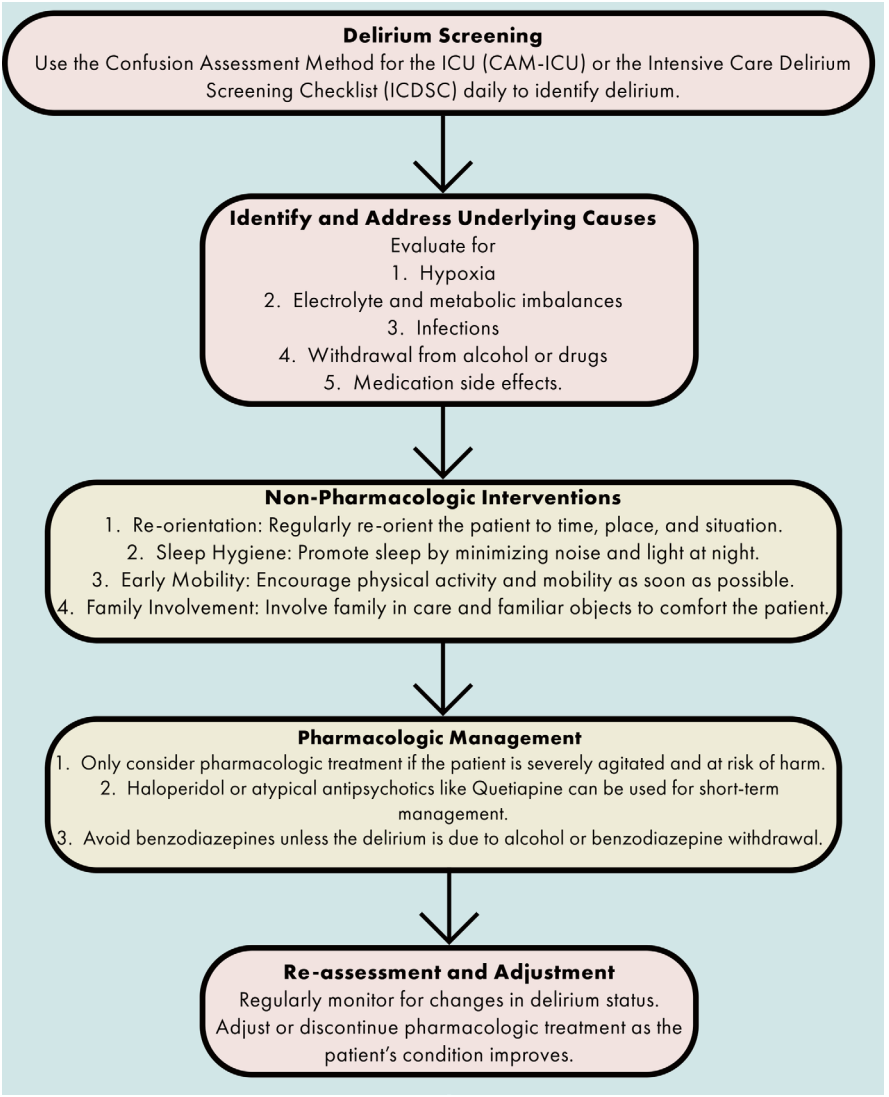
Diagnostic Algorithm
- **Delirium Diagnosis**: Requires the presence of Features 1 and 2 and either Feature 3 or 4.

Advantages
- Quick and easy to administer, often taking just a few minutes.
- High sensitivity and specificity for diagnosing delirium.
- Does not require verbal responses, making it suitable for nonverbal or intubated patients.

15.12 Conclusion

Managing delirium in the ICU demands a multifaceted approach involving early and regular screening, addressing modifiable causes, and implementing both non-pharmacologic and pharmacologic treatments when necessary. Incorporating sleep-promoting protocols, multicomponent interventions like the ABCDEF bundle, and judicious pharmacologic use, supported by continuous reassessment, ensures comprehensive care and better outcomes for critically ill patients.

Algorithm 15.1: Management of delirium in the ICU



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Part II
Nephrology