
Modification in ICU Design May Affect Delirium



Delirium is a common psychiatric syndrome in critically ill patients, associated with high mortality rates and long-term cognitive decline. Recent trials on medication-based treatments have not shown significant benefits, leading to a shift towards nonpharmacologic approaches.

The Society of Critical Care Medicine recommends comprehensive interventions, including reorientation, cognitive stimulation, regulated lighting, and minimised sedation. Sleep disruption is a major stressor in the ICU, with patients often experiencing circadian rhythm disruption and sleep disturbances.

A new ICU room concept with dynamic lighting aims to reduce stress, promote circadian alignment, and facilitate early cognitive stimulation and mobilisation. Researchers hypothesised that patients in modified rooms would experience less delirium than those in standard rooms and that lighting conditions would affect circadian serum melatonin levels differently between the two groups.

Current guidelines recommend nonpharmacologic approaches for managing delirium in the ICU, but research on the impact of ICU design remains limited. The primary objective of the study was to investigate whether a comprehensive change in room design could prevent ICU delirium. The study also aimed to evaluate the effect of lighting conditions on serum melatonin levels. It was a prospective observational cohort pilot conducted in two two-bed ICU rooms at a university hospital. The rooms were modified to incorporate stress-relief measures, including a new dynamic lighting system.

Seventy-four adult critically ill patients requiring mechanical ventilation, with an anticipated ICU stay of at least 48 hours, were included in the study. They were treated either in modified rooms with stress-relief measures or in standard rooms.

The clinical assessment involved evaluating sedation depth, delirium, and pain every 8 hours using validated scores, alongside collecting blood samples for serum melatonin profiles every 4 hours over a maximum of three 24-hour periods. Of the 74 patients, 76% (n = 28) in standard rooms developed delirium compared to 46% (n = 17) in modified rooms. Patients in standard rooms had a 2.3-fold higher delirium severity compared to those in modified rooms. Light intensity significantly influenced serum melatonin levels, with significant interactions indicating that differences in serum melatonin between standard and modified rooms varied over time.

Modifications to ICU room design appear to impact both the occurrence and severity of delirium. Additionally, dedicated light therapy has the potential to affect delirium outcomes by regulating circadian melatonin levels.

Source: [Critical Care Medicine](#)

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