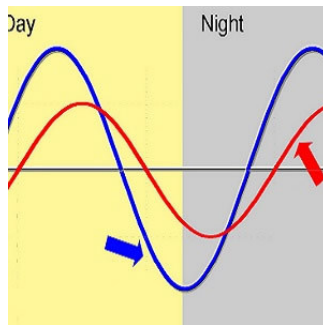


How Circadian Disruption Affects ICU Patients



While circadian dysrhythmias in ICUs exist — expressed mainly as sleep deprivation, delirium incidence, and immunosuppression — hospitals have not taken adequate measures to overcome factors that lead to sleep disturbance, according to a review to appear in *Journal of Critical Care*. The manuscript is already available online, following acceptance for publication.

See Also: [Maintaining Normal Day/Night Cycles in the ICU Could Benefit Heart Attack Patients](#)

"There are strong associations between critical illness, sleep deprivation and delirium however, with the plausible pathway being that a combination of ICU factors identified in this study — light, noise, critical illness and its treatment — contribute to pineal dysregulation, which is translated to reduction of melatonin and cortisol levels," according to the study.

The authors reviewed the literature to determine the factors that contribute to circadian disruption in general, while examining how abnormalities in circadian rhythms are expressed in ICU patients in particular. In previous studies included in the review, noise has been identified as a key factor that disrupts circadian rhythm. This is because ICUs present a complex auditory environment. Monitor alarms, mechanical ventilation, operating and moving equipment, telephones, televisions, conversations between nursing/medical personnel, nursing activities (e.g., endotracheal suction, lab draws, radiographs) and even the footsteps of medical staff have been implicated in circadian disruption and sleep abnormalities.

Once sleep is disturbed the clinical implications cascade to multiple well-being outcomes — the literature notes effects on respiratory, cardiovascular, immunological, metabolic and neurocognitive systems, the review team notes. In addition, mortality statistics show a link with sleep disruption. In a large population of 14,705 ICU patients, rhythms were preserved in significant portion of septic patients who survived the critical illness, whereas, there was a loss of circadian rhythm in non-survivors.

According to the reviewers, the evidence suggests that with relatively modest expense, zeitgebers, or naturally occurring phenomena that cue circadian rhythms, can be harnessed in the cause of chronoenhancement ("resetting of the circadian system"). Alterations to noise and lighting patterns, in particular, show significant promise, the authors say.

Their findings also highlight the need for more studies to assess the impact of the ICU environment on the circadian rhythms of nurses and other medical staff.

"The lighting and auditory environment of the ICU is partly set up to ensure that nurses are alert to patient status and needs, and are able to address those requirements professionally. However, the environment also alters the circadian rhythms and, for example, alertness, of medical staff," the authors write. "There is clearly a need for further primary research within the context of the nurse-sensitive outcomes or indicators field. The nurse, for example, may have different circadian requirements to the patient, meaning the optimal state of the ICU may need to be a compromise."

Source: [Journal of Critical Care](#)

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