



## KEY POINT SUMMARY

## OBJECTIVES

This purpose of this literature review was to see if noise is the most disruptive factor for ICU patients trying to sleep and which noise-reduction strategies/interventions reduced sleep disturbances.

## Clinical Review: The Impact of Noise on Patients' Sleep and the Effectiveness of Noise Reduction Strategies in Intensive Care Units

Xie, H., Kang, J., Mills, G. H.  
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### Key Concepts/Context

The World Health Organization recommends that noise levels in hospitals stay below 30 dBA at night to allow for better rest, yet excessive noise is prevalent in many healthcare settings, including intensive care units (ICUs). Research indicates that, since the 1960s, noise levels in hospitals increased by an average of 0.38 dBA (day) and 0.42 dBA (night) per year. Other research reports that the noise level in ICUs ranges from 50 to 75 dBA, with a night peak level soaring to 103 dBA. It's easy to see why sleep disturbance is common among these vulnerable patients.

This study took place in the UK.

### Methods

For this review, the authors used the Cochrane Collaboration method. They conducted an extensive literature search of the following electronic databases: MEDLINE (1966 to June 2008), CINAHL (1982 to June 2008), Scopus (1966 to June 2008), Cochrane Library (1991 to June 2008), and ISI Web of Knowledge (1900 to June 2008).

### Findings

Of the 167 papers the authors unearthed, 23 met the inclusion criteria. Of the 11 selected previous original papers, 6 studies suggest that noise is only a factor in a small number of overall arousals and awakenings. Five papers state that noise is the most significant cause of sleep disturbance. However, based on SPSS statistic analysis, there are no significant differences between the two views (whether or not



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noise is the major factor in sleep disturbance), in terms of sleep evaluation, method, publication year, type of ICU, age of patients, number of patients, and duration of stay.

According to this research, staff talking and equipment alarms are the most sleep-disturbing noises in the ICU. But most studies have focused on noise level. There is less research on the relationship between sleep quality and other acoustic parameters, including spectrum and reverberation time

### Limitations

In addition to noise, there are many other factors that effect ICU patients' sleep, such as light, medication, and pain. Thus, focusing on sound level has many limitations. Yet, there is evidence that noise-reduction protocols do improve patients' sleep.

### Design Implications

It appears that sound masking is the most effective intervention for improving sleep, but sound-absorbing treatments also work.

According to this study, interventions for sleep improvement fall into four categories: earplugs, behavioral modification, sound masking, and acoustic absorption. Sound-absorbing interventions are relatively effective at reducing noise, but sound masking is the most effective technique to increase speech privacy and minimize distractions. Designers need to be aware of how damaging excessive noise can be to patients' healing.