SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

To determine whether sound transmissions and SSI ratings differ notably between the use of specialized acoustic privacy curtains and normal fabric curtains, and to assess if there are any additional acoustic benefits in using the specialized curtains.

Acoustic assessment of speech privacy curtains in two nursing units

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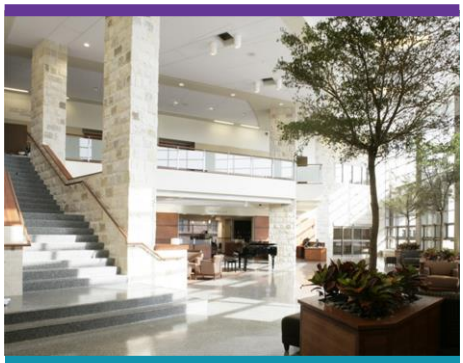
Key Concepts/Context

Hospitals are environments with complex soundscapes, and some elements of these soundscapes can impede upon patient health and overall communication. Numerous sources of noise from equipment, movement, and increased speaking volumes combine with high reverberation rates, resulting in the need to speak increasingly louder. Apart from being detrimental to patient health, this upward trajectory of noise can also lead to diminished privacy throughout the healthcare environment. Many new products have been introduced to help improve hospital soundscapes, such as special carpets, wall installations, acoustic ceiling tiles, and sound-absorbing bedside curtains. However, little research has been conducted to determine whether any of these products help reduce noise and also promote intelligible, unstrained communication. Two measures used to assess speech intelligibility are the Speech Intelligibility Index (SII) and the Articulation Index (AI). These measures focus on sound transmission within a given space, such as an area outfitted with curtains.

Methods

Three rooms in a newly refurbished nursing unit and five rooms in a standard nursing unit were involved in this study. The newly refurbished rooms were designed for noise reduction, incorporating sound-absorbing ceiling tiles, improved wall structures and "quiet rooms" for staff discussions, while the standard rooms did not feature any specialized noise-reduction designs. Sound transmission and reverberation time was measured in all of these rooms under three conditions: 1) With standard privacy curtains pushed against the walls, 2) With standard privacy curtains deployed, and 3) With enhanced acoustical privacy curtains deployed. Measurements were gathered over two consecutive days.



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Findings

Sound transmission and reverberation assessments of all involved nursing units showed that the acoustically enhanced units featuring private, sound-absorbent curtains provided substantial auditory protection for patients. However, the noise reduction performance of the sound-absorbent curtains was limited by the overall acoustical design and architecture of the units themselves. The sound-absorbent curtains improved overall sound absorption in all rooms (with relatively low reverberation) by 20-30% while also providing a speech privacy improvement of 15-60%, according to SSI and AI results.

Limitations

The authors noted a number of limitations in this study. A relatively small amount of rooms were involved in the study while normal hospital operations were being carried out, meaning these results cannot necessarily be generalized to all other units. The differences in design between the two types of units involved in this study had a significant impact on the results, further indicating that these results may not provide universally applicable conclusions.

Design Implications

Sound-absorbent curtains can be an easily maneuverable and effective solution for reducing noise around patient beds, while also providing privacy for communication between individuals. When used in conjunction with sound-absorbent ceiling tiles, flooring, and wall designs, the overall decrease in noise in a given unit can be significant. Designers should consider how the overall design of a given room might impact noise levels in spite of these sound-absorbent features, as the overall architecture of a given space will have a significant impact on reverberation and acoustics.

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