SYNOPSIS

KEY POINT SUMMARY

OBJECTIVES

To use physical measurements to determine the acoustical quality of healthcare office environments as well as the relationships of certain design features to the environment's acoustical qualities.

Objective acoustical evaluation of healthcare office facilities

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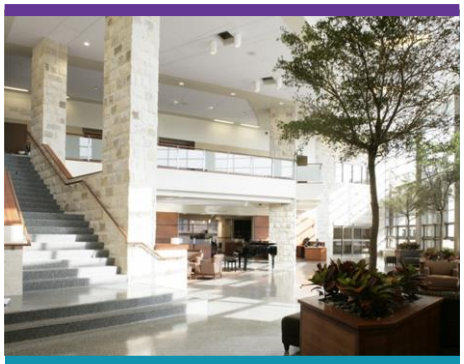
Key Concepts/Context

In this relatively brief study, the author chooses to survey a number of different healthcare offices in different locations in order to describe their acoustical nature and identify how certain design elements affect acoustical properties. Many different aspects of the offices' physical design are taken into account in order to produce a comprehensive analysis of what exactly affects a given environment's acoustical characteristics, and what could potentially be done to improve these characteristics.

Methods

17 different healthcare office environments on a total of 30 floors from 17 different buildings were assessed in this study. The average height of each room was 2.7 meters high, from the floor to the suspended acoustical-tile ceiling (SAC). Every building involved in the study was mechanically ventilated. On five floors out of the 30 involved in the study, sound-masking systems had been previously installed and were in operation during the study. The different types of spaces included in this study were: private offices (POs), shared offices (SOs), open-plan offices (OPOs), lunch rooms (LRs), meeting rooms (MRs), and breakout and telephone rooms (B/TRs). The OPOs analyzed in this study varied notably in shape, size, and cubicle/workstation number. Workstations within all OPOs were organized in a wide variety of configurations using partitions that were anywhere from 1.2 – 2.0 m. Background noise levels were measured in all occupied spaces. Reverberation time, speech levels/speech intelligibility, sound reduction with distance doubling, and internal partition noise isolation were all measured in unoccupied spaces.



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Findings

Analyses of all measurements provided various insights into the role of design features in contributing to the sound quality of workplaces. Interpretations of the measurements show that, generally, speech privacy between a source and a receiver requires some degree of internal partition separation, and that ceiling height, floor and ceiling sound absorption, and space beneath doors all greatly affect the dissipation of sound.

Limitations

Although a large sample size was involved in this study, individual or more subjective accounts of noise levels or speech intelligibility in certain environments were not accounted for. The wide spectrum of differences between the designs of spaces included in the study could mean that the results are not broadly applicable to some spaces.

Design Implications

Healthcare designers should consider how the dynamics of sound in a given space might help or hinder the space's intended function. If a particular room in a healthcare facility should remain as quiet as possible at all times, effective sound-absorbing materials should be considered when planning floor, roof, and wall construction. Strategically placed partitions can also help corral sounds into specific areas where they are needed for communicative purposes, while also stopping them from reaching areas that are supposed to remain quiet.

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