

DEVELOPING EVIDENCE-BASED DESIGN STRATEGIES, METRICS and METHODS for IMPROVING HEALTHCARE SOUNDSCAPES

ABSTRACT: Healing and clinical work requires a complex choreography of architectural acoustic design in healthcare settings that is only beginning to be understood. In most healthcare settings, medical staff members conduct vital tasks that may have life-and-death implications. Patients visit the hospitals to heal. Their expectations include fast recovery, restful sleep, and privacy (i.e., speech privacy). However, sound environment qualities of the care settings often fall far from supporting the mission of hospitals. There is strong and growing evidence showing that effective soundscapes in healthcare settings impact healing, errors and stress for patients, families and staff but it is still not clear what measures of the sound environment best predict key healthcare outcomes and what design strategies best impact those measures. Our preliminary field research shows that characteristics of critical care sound environments with different layout designs can vary drastically and impact wellbeing and task performance. This study aims to develop a toolkit of evidence-based design strategies and technologies by statistically defining the relationships between three types of variables: (1) architectural layout metrics, (2) acoustic metrics, and (3) occupant response. The architectural layouts will be quantified with a variety of metrics, using software packages such as Quelize and Depth Map. The soundscapes will be quantified with a variety of acoustic metrics that capture detailed characteristics using CATT 3D acoustic modeling software. Modeling predictions of the real-world wards will be verified with field acoustic measurements. Our research team consists of members from both academia and industry to combine expertise in architecture, engineering, acoustics, psychology, and medicine. Our efforts will aid the healthcare design community in helping them design hospital layouts that are more conducive to occupant health and productivity. We are requesting \$39,568 to support this project.