



Noise and care make for a tricky balance in acoustics

Text by Jennifer M. Hinckley

There are a number of critical care areas in a health care facility where noise control, privacy and patient comfort offer challenging requirements for the acoustical designer.

The neonatal intensive care unit (NICU) and oncology treatment center are examples of environments where patient care relies on a highly trained medical staff and top of the line medical equipment.

The acoustical challenge in these areas is to balance the need for a restful, quiet environment with systems that are critical for medical treatment and safety.

The vital signs, respiratory function and nutritional needs of infants in the NICU are closely watched with the assistance of a complex array of medical tracking monitors. At any time in the NICU, the level of sound and the source of sound range widely.

While the goal is to provide a restful space for the child, there is a constant intrusion of medical equipment noise, including beeping alarms, humming fans and whirring intravenous/nutrition pumps.

Combine these with the activity sounds generated by busy nurses, visiting parents and the soft mew of infants during their care time, and a noisy environment results.

There is an ongoing discussion in the health care equipment industry related to the alarm sounds generated by the various pieces of equipment. Equipment manufacturers must strike a balance between the impact of those alarm sounds on a patient's health

vs. the critical need for redundant alert systems to inform the medical staff of a patient's status.

The acoustical designer is familiar with the current technology being used in a range of medical facilities and should work with the

the patient. Continuous monitoring of multiple patients by the medical staff, however, becomes a challenge.

Within each treatment area, it is often possible to organize the patient areas and nurse workstations to maximize the visual coverage of the patients while providing a degree of privacy.

The addition of noise-absorptive materials, in the form of highly absorptive ceiling tiles and acoustical wall panels, will reduce the buildup of sound in the room. While critical care spaces will continue to be active environments, it is

possible to design with a balanced approach focused on patient comfort and quality of care.

This is particularly critical in spaces like the NICU, where patients cannot advocate for their own comfort.

Several organizations, such as the Facilities Guidelines Institute, the Acoustical Society of America, the Institute of Noise Control Engineering and the National Council of Acoustical Consultants, are working together on a health care acoustics standard in an effort to address a number of these issues, which may one day contribute to quieter patient environments.



...there are three aspects of design critical to comfortable acoustics: attention to space planning, layout of the various treatment areas and appropriate selection of acoustically absorptive building materials."

building designers to best incorporate the sound-generating equipment into acoustically sensitive spaces.

Oncology treatment centers typically contain suites where patients receive medications by intravenous infusion. These treatment suites are active spaces where nurses treat a number of patients simultaneously.

Again, there is a significant amount of activity sound in addition to the beeping equipment alarms and whirring pumps.

During the design of a health care facility, there are three aspects of design critical to comfortable acoustics: attention to space planning, layout of the various treatment areas and appropriate selection of acoustically absorptive building materials.

Individual treatment rooms would provide improved privacy and freedom from distraction for

Jennifer Hinckley is a senior associate in architectural acoustics at Acentech, Cambridge, and focuses on acoustics for health care and education environments.