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The Critical Role of Acoustics in Healthcare Design

In healthcare environments, the quality of care extends beyond clinical expertise and into the built environment itself. Among the many design and performance considerations, acoustics plays a fundamental, yet often underestimated, role in shaping patient outcomes, staff wellbeing, and overall operational effectiveness.

Noise levels in hospitals have gradually increased since the 1960's, with studies consistently showing that facilities around the world exceed recommended thresholds. This growing challenge is placing renewed focus on how healthcare spaces are designed and how acoustics can actively contribute to healing.

Why acoustics matter in healthcare settings

There is now significant published evidence demonstrating the challenges created by poor acoustic design and the benefits to both patients and staff from good acoustic design. Noise is known to hinder communication in spaces where it can be critical to patient wellbeing, impact patient's ability to rest, and has even been linked to impact on patient health outcomes. A study by AECOM showed that significant numbers of respondents reported sleep loss, reverberation issues, and a lack of privacy during consultations.

The growing emphasis on community-based care models further reinforces the importance of acoustics in healthcare environments. The latest Neighbourhood health centres: design and performance specification[1] highlights the need for "inclusive and dementia friendly design in mixed use spaces that can be adapted to use by the community." This means materials and design choices must work smarter and harder within each building, balancing acoustic performance with hygiene, durability and flexibility. As these spaces evolve to support a wider range of users and functions, flexibility in design and adaptability will be critical, and managing clear communication within often open, multi-purpose environments will be essential to success. Thoughtful acoustic design therefore becomes a key enabler not only supporting patient wellbeing, but ensuring spaces remain accessible, intuitive and effective for all users

When patients are ill, resting and sleeping are vital for recovery. To be able to rest, patients need an environment that is as calm as possible. In wards with a poor acoustic environment, background noise levels can be higher. Sound bounces off hard surfaces, spreads throughout rooms, and privacy can be reduced, or clear one-to-one communication made impossible. This noisy environment can easily cause patients to feel anxious and stressed. When a sound-absorbing ceiling or wall absorbers are installed, the environment changes. Sound becomes absorbed before it can spread. This leads to a calmer and more relaxed environment that focuses on putting staff and patient wellbeing at the forefront.

Designing for better acoustic performance

HTM 08-01 provides minimum performance guidelines for designers and says "Good acoustic design is fundamental to the quality of healthcare buildings. The control of unwanted noise improves patient privacy, dignity and sleep patterns; all key conditions for healing. Good acoustic design also increases the morale and comfort of healthcare professionals and is essential for good communication between patients and staff."

[1] https://www.england.nhs.uk/long-read/neighbourhood-health-centres-design-and-performance-specification/

The noise sensitivity of any area is dependent on the type and source of the noise, and use of the space. The design should include decisions on the layout of the site to optimise acoustic performance and should be informed by a pre-design noise survey carried out by a competent person.

Design approach: consideration of systems and solutions

Careful consideration of systems and materials is essential to achieving effective acoustic performance in healthcare environments, without compromising other critical requirements such as infection control, durability, fire safety and cleanability. Acoustic separation between spaces must be achieved through appropriately specified partition systems, designed to meet required levels of sound insulation while maintaining robustness and compliance with healthcare standards.

Ceiling systems play a key role in managing reverberation and improving speech clarity, particularly in areas where clear communication is critical, such as consultation rooms, wards and nurse stations. These systems must balance high acoustic absorption whilst adhering to strict hygiene demands regarding cleaning and disinfection.

In addition to ceilings, wall-based sound absorption may be required in certain applications to further control reverberation and improve overall acoustic comfort, particularly in larger or more open-plan environments. Across all applications, the specification should consider how different elements work together as a system, addressing sound absorption, sound insulation and flanking paths, to deliver a coherent acoustic strategy.

Ultimately, successful acoustic design in healthcare environments depends on selecting solutions that are appropriate to the function of each space, ensuring that performance requirements are met while supporting flexibility, usability and long-term operational effectiveness.

Common pitfalls and how to avoid them

When designing, flanking sound must be considered, and design details created to avoid it. Overcompensating for noise and particularly reverberation time can be just as bad as undercompensating, a space with very low reverberation time can feel unpleasant to be in, just as much as a particularly reverberant space. Careful use of sound absorbing products under the guidance of a competent person can dramatically improve the overall “feel” of a space.

When fitting a ceiling or wall solution, it is critical to follow the correct installation guides, doing so ensures the system has all the correct components and the panels are able to perform to their full potential

The future of healthcare acoustics

As our awareness of the criticality of acoustics grows in healthcare settings, building design will become ever more important in the control of noise. This is particularly relevant in the context of the New Hospital Programme and Hospital 2.0, where a move towards standardised, repeatable design and modular construction is reshaping how healthcare environments are delivered. These approaches rely on carefully coordinated systems and consistent spatial layouts, meaning acoustic performance must be considered early and embedded within standard design principles, rather than applied retrospectively.

Where building layout cannot solve challenges, acoustic screens, wall absorbers and high-performance systems will be used to complement designs. As hospitals become more compact, with optimised adjacencies and centralised staff hubs designed to improve communication and efficiency, managing noise and ensuring speech clarity will be increasingly important to support safe, effective care.

Use of specific approaches for different noise sources is likely to grow, particularly as hospitals integrate more digital technologies and smarter operational models. While the

idea of acoustic “masking” is a popular one, control of noise at source or recipient is more effective and often more pleasant for the space user. Ultimately, in more standardised, flexible and digitally enabled environments, acoustics will need to function as part of a coordinated system, supporting communication, privacy and adaptability across a wide range of healthcare settings.

Conclusion

Acoustics is no longer a secondary consideration in healthcare design. It is a critical factor in delivering environments that truly support healing, enhance communication, and improve experiences for both patients and staff.

By combining evidence-based design principles, adherence to standards such as HTM 08-01, and the appropriate use of modern acoustic systems, healthcare providers can create spaces that actively contribute to better outcomes.

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