

SOUND SOLUTIONS CASE STUDY

ACOUSTICS & PATIENT SATISFACTION IN HOSPITALS

Addressing acoustics with a multi-prong approach for absorbing, blocking and covering sound has been a winning formula for decades. In hospitals, where gypsum ceilings and other hard surfaces often contribute to a poor acoustical environment by reflecting and reverberating sound, there has been a growing need to apply a better approach and a return to the A, B, C formula as a basis for good acoustical construction and design.

Volumes of research support the importance and impact noise levels have on patients (see study list on page 2) and hospitals are paying attention. In its monthly update to its employees and staff, The University Hospital/ SUNY Upstate Medical University cites the following impact of high noise levels on patients and encourages employees to participate in reducing these levels to improve patient satisfaction.

THE IMPACT OF HIGH NOISE LEVELS ON PATIENTS

- Sleep Disruption/Awakening
- Decreased Rate of Wound Healing
- Higher Incidence of Rehospitalization

Hospitals like The Saint Alphonsus Regional Medical Center in Boise, Idaho have also attested to the marked improvement in the satisfaction reported for patient rooms and attributed to reducing noise, upgrading the ceiling tile and moving to single patient occupation for greater privacy. Their satisfaction surveys used a 10 point scale and patients rated their quality of sleep at 7.3 in the new upgraded private rooms versus 4.9 in the old semiprivate rooms.

The importance of sleep quality in contributing to patient recovery is well documented. Proper acoustics and using sound masking has been recognized as contributing positively to the healthcare environment to foster this.

CHALLENGE:

At Holy Spirit Hospital in Camp Hill, PA they had traditionally used hard ceilings in their construction, but this created acoustical problems in patient rooms, as Tim De- Blaey, vice president for cardiovascular services explained, "Although using hard ceilings in the patient rooms made it easier to clean than tile, we were in a quandary about why our rooms sounded like echo chambers."



THE ABC'S OF ACOUSTICS

Combining high performance ceiling tile to absorb and block sound, and adding a quality sound masking system to cover the remaining sounds that are not absorbed or blocked is the best way to approach the acoustic design for privacy and for comfort.

ABSORPTION

- **NRC or Noise Reduction Coefficient** measures the degree to which a surface or material absorbs sound.
- **AC or Articulation Class** measures how well a ceiling panel prevents sound from reflecting back down to adjacent workspaces in an open-plan environment.

BLOCKING

- **STC or Sound Transmission Class** measures how well a wall or partition prevents sound from transmitting to the other side.
- **CAC or Ceiling Attenuation Class** indicates the ability of a ceiling panel to block sound transmission.

COVERING:

- **AI or Articulation Index** represents how well speech can be understood in a given space.
- **PI or Privacy Index** represents how well the elements in, and the properties of, a space render outside conversations

Speech Privacy Can Be Objectively Measured Using Articulation Index (AI) and Privacy Index (PI)		
Speech Privacy Levels	AI	PI
Normal	≤0.15	≥85%
Confidential	≤0.05	≥95%
Secure	Special consideration required	

As per **ASTM E - 1130** Standard for Speech Privacy
AI varies from 0 (absolute privacy) to 1.0 (perfect intelligibility, no privacy)
PI is a related rating system and the inverse of the AI
 An AI of 0.15 is a health care standard versus an AI of 0.20 for open office plan as a standard

