

Speech Privacy: Beyond Architectural Solutions

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ABSTRACT

Health Insurance Portability and Accountability Act of 1996 (HIPAA) has brought unparalleled pressures on healthcare organizations to protect private and confidential information from disinterested third parties. Yet, often in the middle of noisy corridors and waiting rooms, this same information needs to be quickly transferred from physician to nurse to family member to others for the care of patients. Research and examples show that when families, patients, staff are participating together, although independently, in the same or adjacent spaces, the “café effect” produces rising noise levels as each person competes to be heard. This threatens the very confidentiality demanded by HIPAA. Solutions to this problem are not easy or completely resolved solved by engineering or design specifications. It is ultimately the culture of the healthcare organization that determines the “sound” of a hospital. Proven solutions presented herein address culture in tandem with architectural and acoustic design interventions.

1. INTRODUCTION

Since the rapid onset of informational technologies, privacy as a cultural icon has been guarded and threatened, secured and stolen, defined and obscured. In many cultures, where privacy exists on a minimal level, it is not perceived to be at risk because it is not expected. Basically, one cannot lose what one has never had. In the U.S., however, privacy is highly valued as evidence of a free society. Now interpreted to be a constitutionally guaranteed right, privacy and confidentiality have been supported by legislation and court action. Most recently, with the Patriot Act, personal privacy has been at odds with national security. To some, national security takes precedence over individual rights; to others, protection of privacy is the very foundation of a free society.

The U.S. health system mirrors its culture. While private health information is now protected, historically it has been bartered for reasons of public health. Tuberculosis and polio were both highly contagious. Infected individuals were isolated, often sent to sanatoriums, with or without their consent. The emergence of AIDS in the 1980s caused the next debate regarding personal vs. public health. However, high risk populations in fear of their privacy were reluctant to being tested, diagnosed, and treated for fear of job discrimination and public recrimination. This then became a greater risk.

Currently, newspapers publish marriage licenses, divorce decrees, birth certificates, obituaries, legal transactions, and (in some cities) traffic and criminal activities. The Freedom of Information Act is an attempt to limit the privacy of political institutions and public affairs. The “right to know” vs. “the right to withhold,” along with “don’t ask, don’t tell” policy is continually debated.

The evidence of whether privacy is a culturally defined value is found in common practices and expectations. Both a reflection of culture and an effort to control it, legislated privacy is often

plagued by exceptions or has legal sanctions that are and non-enforceable by virtue of the damage being irreversible. Culturally defined privacy, in contrast, is extended as a courtesy by one individual to another at home, at work, and in social situations. Its sanctions, however, are within the domain of relationship, reputation, and personal rebuke.

Verbal privacy, unlike privacy of personal documented records or communications, is in the domain of a culture, not merely a matter of information control. Privacy, as opposed to secrecy, is a spontaneous, circumstantial, fleeting, and unpredictable consideration extended to and by individuals or groups.

2. BACKGROUND

Institutions serving individuals in public places, such as hospitals, are not private. Both verbal and aural privacy are breached because spoken words and inadvertent listeners tend to meet in midair without notice. Privacy in public places is based more on anonymity than on invisibility. Furthermore, providing for privacy in an open and highly populated culture is based on acceptance that little is private and only protected by anonymity.

Patient privacy is demanded but often only minimally provided. In a waiting room lined with rows of chairs facing each other in even lines, information is openly shared between family members with the assumption of anonymity. In emergency departments, the identification and use of privacy curtains are misleading given that the scope of privacy is broad and the curtain's function greatly limited.

For patients in breast care clinics, for instance, curtains and wrap-around robes provide privacy to a degree; however, having to walk down a hall to the mammogram room can be uncomfortable. Cloth garments in a physician's offices have been exchanged for paper ones and doors often open into the exam rooms, exposing scantily clad patients to the public corridor. Admitting areas look more like bank counters with multiple tellers and one patient is overheard providing medical histories, insurance data, and other private information while sitting less than three feet from another patient. To this day, despite all the pressures to the contrary, in many outpatient clinics, names are called aloud as if in a fast food restaurant, and staff yells to the hearing-impaired elderly without regard to who else is within earshot.

Historically, patient and family privacy was not so much of an issue, as physicians made house calls and few patients were admitted to the hospital. Today, because of the nature of institutionalized healthcare, the built environment, bureaucratic procedures of our employer-based healthcare system, and the fiduciary nature of the patient-physician relationship, privacy now requires policy declarations, legislation, and judicial review.

In the hospital, the environment of care is spatial, temporal, and so undefined as to imply everywhere and all the time. Nonetheless, there is a presumption of privacy and confidentiality mandated by law, ethics, and culture. The challenge is in designing privacy and confidentiality into the environment in ways that support the ethics and practices of providers while providing the intended protections for patients and families. Visual barriers, conditioned sound environments, and ongoing monitoring of the density of people provide clues as to whether patient privacy (and dignity) is being tended to adequately.

An example of privacy-extended-but-not-provided is shown in the relationship between roommates in semi-private hospital rooms. While privacy curtains offer visual barriers, overheard conversations are seldom referred to and even a patient's painful groans are not intruded upon unless there is definitive concern for the patient's life. This is "minding one's own business," which is considered good manners, and is not controllable by good engineering.

Furthermore, while acoustic treatment can temper the risk within healthcare settings, the nature of how we provide care provides easy pathways for information to be freely transmitted. Given that the need for privacy has not lessened, other industries have demanded solutions. One answer has come forth from acoustic engineers has been masking technologies the purpose of which is to ostensibly undo speech intelligibility, localization, and auditory clarity. Clearly this poses unintended risks in a critical care environment where providers are dependent upon each of these factors to monitor patients.

3. WHAT IS PRIVACY IN HEALTHCARE?

Privacy is an obvious outcome of isolation, and isolation is the most extreme form of privacy. Both are aimed at preventing unwanted penetration of the information gate and escape beyond it. Both conflict with the objectives of institutional healthcare. Practicing efficiency, effectiveness, and fluidity of communication for many people congregated in one location oppose the ideals of individuality, personal preference, and controlled communication.

Hospital administrators, patients, and family members are facing a similar duality in compliance with the Health Insurance Portability and Accountability Act of 1996 (HIPAA) [1]. First and most obvious is the challenge of resolving the duality between keeping some third parties out of one's private business while letting others in. In spite of good intentions, communication technologies, the lack of auditory soundproofing, visual violations (charts, monitors, and letters in plain view) are all fairly effective in breaching HIPAA regulations.

When it comes down to the reality of health or illness, patients expect needed information to flow easily across the pathways of care giving and not be trapped by red tape. Families cringe at the idea that the right hand of the primary care physician does not know what the left hand of the surgeon is doing. Delays in information being passed between interested parties because of the new HIPAA mandates could be costly, frustrating, and possibly life-threatening.

So, what is realistic in evaluating the effectiveness of the well-intended and imperfect HIPAA mandates? Who is responsible for providing an environment in support of HIPAA? We must ask whose task it is to ensure privacy and whose skills and technologies pose the greatest risk or provide the greatest protection.

Perhaps the greatest ambiguity regarding privacy occurs in the auditory environment. Absolute auditory confidentiality does not exist in the healthcare environment or is rare or incidental at best. Regardless of acoustic treatment, closed doors, and barriers of the highest quality, hearing acuity is uncontrollable and immeasurable. A child, who seemingly hears sounds and words that adults fear most, knows no confidentiality. Adults, whose hearing is impaired most of the time, hear words and inflections and translate them into whole news stories with varying degrees of accuracy. Likewise, nurses and physicians appropriately exchange critical information at the

right time and in what is now labeled as the wrong place. Patients whose rights have been violated may be either grateful or resentful, depending on the news and their situation.

Charles Fried of Yale Law School stated that “privacy is not simply an absence of information about us in the minds of others, it is the *control* we have over information about ourselves. It is not simply control over the quantity of information abroad; it is the ability to modulate the quality of the knowledge as well. We may not mind that a person knows a general fact about us, and yet we feel our privacy invaded if he knows the details.” [2] Regarding health issues, patient survival is often based on details being communicated immediately to the right person wherever they are standing, often regardless of who else is within hearing range. Here is where HIPAA compliance runs into conflict with clinical practice.

4. THE ONSET OF HIPAA

HIPAA was, in part, passed because confidential information was being transmitted through various uncontrolled conduits and could be accessed by unknown third parties. While HIPAA does address verbal confidentiality, it uses a standard of “reasonableness” and “good judgment” in practice. These standards are far from quantifiable. Hospitals and other providers are implementing specific protocols to protect written and electronic records and, as yet, have not been able to harness the massive amounts of information exchanged verbally.

Perhaps over simplified, the *who*, *what*, *where*, *why* and *when* are the major tests of HIPAA’s regulatory triggers, which are only evaluated when a claim of violation is filed. In the HIPAA standards, compliance is voluntary and so are complaints. The ambiguity is so apparent that even HIPAA authors made it the task of patients to insist on enforcement, dealing with the standards on a reactive basis. The Privacy Rule published by the Department of Health and Human Services [1] that summarizes and explains HIPAA is laced with exceptions, ambiguities, and suggestions for practicing an intention to keep private even when it is not possible. That said, enforcement of HIPAA is complaint driven. HIPAA is ultimately being verified in practice with the standards set forth to contain what seems uncontainable and has yet to be fully tested in all of its aspects.

Inside the healthcare arena, HIPAA has determined that *who* —patients’ identity—and *what* —their diagnosis or condition or other information— are to be assumed confidential (inside the privacy fence) unless otherwise indicated. *Why* information is exchanged is perhaps the most critical place where definition and protection is needed. The Privacy Rule clearly states that privacy is not to take precedence over patient safety or medical communications requisite for patient care. Nonetheless, motives behind information seeking and management are perhaps the major fear to the patient. However, *where* information is exchanged and *when* the information should be accessible are also more questionable and leave much room for dispute, delay, and confusion.

5. RESEARCH: HOW IS PRIVACY PERCEIVED AND WHAT ARE ITS OUTCOMES

In a report titled “The Role of the Physical Environment in the Hospital of the 21st Century,” Ulrich and Zimring cite research [3] showing that physicians and nurses very frequently breach patient confidentiality and privacy by talking in spaces where they are overhead by other patients or persons [4]. They also further mention a study of an emergency department at a university hospital that showed 100 percent of physicians and other clinical personnel committed

confidentiality and privacy breaches [5].

A study that looked at patient's perception of privacy and related outcomes [6] showed that patients withheld medical information when they only had a curtain barrier as opposed to walls. Clearly this implies that auditory privacy -- as it is perceived and experienced -- impacts patient safety. It also implies that patients who overhear confidential information from their own bed or gurney believe that they are being overheard. In this study, some patients refused parts of their physical exam because they felt that they had no privacy.

The nature of noise and its impact on communication adds one more threat to auditory privacy. The "Lombard Effect," which causes people to raise their voices above the noise floor, increases the chances of information penetrating the privacy walls [7]. In a review of the impact of the Lombard Effect on speech recognition, Atushi found that the louder the noise, the less accurate was speech recognition. The implication is that errors could be made in a noisy setting and, as well, perception of privacy is threatened. The louder it is, the louder it gets. The louder it gets, the greater chance the one voice will rise above the others, and with the voice comes misunderstanding or inaccuracies of communication as well as breaches of privacy.

By balancing the use of opaque visual barriers with transparent sound barriers, such as acrylic walls, providers and patients alike can better learn to trust what surrounds them. Nursing stations that are accessible but not exposed, controlled paperwork (as long as it exists), and computer monitors that are placed with cautions regarding use and misuse are not difficult to implement, if thought through carefully.

Nonetheless, the question remains of the role and responsibility of engineers. Does responsibility for control of oral information fall solely within the scope of work of acoustic/noise control engineers?

6. PRACTICES THAT HAVE IMPROVED NOISE LEVELS AND ENHANCED PRIVACY

Healthcare organizations have long histories of noise abatement policies but a short list of models that exemplify their objectives. Reasons for failed policies include everything from the speed of new technologies that add to the cacophony of the hospital to architectural designs that are out of date. Acoustic materials have proven to be effective, but not to the point of overriding the impact of highly populated areas and cultural practices. Whether utilizing barrier control, acoustic ceiling tiles, or carpeting, the challenge remains as to how to best create an appropriate auditory environment that supports the diverse needs of patients, families, and caregivers.

Communication technologies such as internal cell phones and pagers, while perhaps the most efficient methods of transmitting information and reaching persons critical to patient care, are also one of the most challenging new intrusions in the auditory environment. While acting as a tether between critical patient needs and those who care for them, staff cell phones and pagers are used wherever and whenever they beacon.

Anecdotes abound about inappropriate conversations in the wrong place. At one hospital in Georgia, the person in charge of the morgue whose job it was to remove patients after they expired was on an elevator filled with people when he got "the call" on his cellphone. He knew

to get off at the next floor, avoiding taking the call in this crowded elevator of visitors. Once on a floor, it still took him a while to find a private room where he could respond to the call. At another facility where they were piloting the use of cell phones on one floor, a nurse received a call and because she was responding the noise levels in the corridor in which she was standing, she yelled over the phone, repeating the name and location of the patient under discussion. The "café effect" might well be renamed the "cell phone effect" as the results are the same.

The following incomplete list of some common acoustic treatments and their known outcomes and exceptions:

1. Acoustic ceilings: Effective in absorbing sound, but lose their quality over time. Many hospital building managers do not monitor the quality of their ceiling tiles. Air conditioning leaks, stains, and dust over time weaken the acoustic properties for noise reduction as the particle and moisture disturbs the textured surfaces.
2. Doors and walls: Barrier control is the common effort at offering privacy; Doors and walls are frequently not sound treated and their elusive effectiveness causes staff and patients to act as if they are in private quarters although they are not.
3. Carpeting: Is definitely better than hard floors, but difficult for gurney mobility, cleanliness, and requires vacuum cleaners for maintenance.
4. Noise-reduction hard flooring: An effective solution, but still not the most common practice.
5. White and pink noise masking technologies: While effective in diffusing language to the point of impacting distant speech intelligibility, it also undermines the ability to localize sound, which is critical to remote nursing practices. It is inappropriate for the clinical setting or, at best, has very limited application.

While not soundproofing, music and television offer competition for other verbal information. Positive distractions reduce the impact of noxious sounds and provide a veil of privacy. The television, which often considered an annoyance, does function as a distraction, and does also serve to mask outside sounds. The question of the benefits of specific television or musical content has to do with matching the programming to the needs of the patient. Given the need for privacy, the negative impact of noise, and the positive impact of appropriate music and other positive distractions, combining good engineering practices with other options can be an effective strategy.

Anecdotal evidence has shown that the appropriate use of music in public areas and in corridors of hospital units can lower noise levels and provide a veil of privacy. The hospitality industry has long used music as means of cloaking the noise of dishes and providing for privacy of their patrons who are seating in close proximity. The challenge for hospitals is finding and implementing appropriate music for a setting of widely diverse populations.

Balancing speech privacy with the need for visual access to patients, families, and preventing social isolation requires knowledge of exactly how the space functions. Using clear sound barriers as opposed to walls can serve both purposes. Creating a space for children to be "seen but not heard" acknowledges diverse needs of a cross-generational population.

Seating arrangements also provide a means of separating families. Clustered seating, ensuring that families may sit together and have personal discussions at normal volume levels minimizes

the Lombard Effect. Thinning the population spread sometimes helps and sometimes causes greater transparency. The lower the noise floor, the more can be clearly heard.

Several new products have been developed to act as a dB meter to indicate volume levels much like the speed light that is often used to show automobile drivers their current speed. The problem with them is that it unbiased and out of context. It picks up the sound closest to it. However, some hospitals are in the process of evaluation.

While the in services and new employee orientation sessions may address noise, until the issue becomes as baseline indicator of quality, the auditory environment is ignored. Staff meetings should include overall evaluation of the quality of environment, needs for maintenance requests, and problems that need solutions. Waiting areas should be monitored and adjusted if seats are moved and congestion results. Nursing stations should be evaluated as to traffic flow, where staff discussions will take place and where visitor interchanges occur. Nighttime and daytime needs must be addressed as the auditory environmental risks reverse between day and night from too noisy to too quiet.

Also, ceiling tile standards should be provided and indicators for replacement should be clarified. Hydraulic doors should be checked on a regular basis. Ventilators (all air ducts) for fan noise. Vending and ice machines are the mechanical “elephants in the room.”. Non-clinical in their application, they are often placed in visitor areas and the noise from their operation drifts into patient areas.

While not engineering solutions, these kinds of considerations bring the engineer into partnership with the architect and designer. Otherwise, the engineer is being handed responsibilities that are not theirs alone.

These suggestions do include other options, specifically positive distractions that both reduce the impact of noxious sounds and provide a veil of privacy. While not soundproofing, music and television offer competition for other verbal information. The question of the benefits of specific television or musical content has to do with matching the programming to the needs of the patient. Given the need for privacy, the negative impact of noise, and the positive impact of appropriate music and other positive distractions, combining good engineering practices with non-engineering solutions can be an effective strategy.

7. CONCLUSIONS

Safety for patients and effective care requires a healthcare environment that is in alignment with the organization’s mission, not a militarized zone of secrecy where needed information is put into unintended isolation. A new standard of information management is required. Ultimately, time and practice will reveal what is best and practical for the optimal outcomes for everyone involved. For HIPAA to be an effective policy and not a liability, the environment must no longer be considered just a regulation or a good idea, but must be acknowledged as the custodian, if not the guardian, of privacy, confidentiality, and HIPAA compliance.

The dictates of HIPAA and the right to privacy are easier and demanded than accomplished. Within the auditory environment lie the keys to privacy as well as confidentiality. However,

when using the paradigm of the noise society vs. the surveillance society, it is clear that the most difficult task is to remain an “anyone” and only to become “someone” by choice and intent.

Engineering solutions directly impact communication, audibility, and primary information containment. However, none of the solutions on their own can guarantee or effectively control the auditory privacy. Moving the sounds out of the generic wash of random sounds into the specific experience of a patient, family, and caregiver is a cultural task and, with HIPAA, a professional obligation. Bringing together organizational ethics of privacy with acoustic treatment offers the strongest and most effective strategy for protecting individual privacy.

Privacy is a perception, a courtesy, a practice, a right, and a promise. It is realized through a dynamic partnership between substantive and evidence-based design and function, and between the built environment and those who use it that will best improve the chances of protecting information and individuals.

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