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Designing for Health in the Next Millennium

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The healthcare network of the future must serve a population of nine billion

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This article was presented at the 1998 International Conference and Exhibition on Health Facility Planning, Design, and Construction. From the introduction please note the following quote:

> "What the future will bring in terms of opportunity, change, and challenges is uncertain. However, existing trends in the healthcare industry can perhaps offer some insight. We feel that the century will see a change in how architectural and related-firms approach engineering the design of health facilities. The client for firms will evolve from individual and isolated facilities to a healthcare network.
>
> Accordingly, architectural firms will be compelled to develop new skills, services, emphases, and organizational structures in order to respond to the rapidly changing needs and demands of this new client. It is our hope to present a visionary view of the possibilities of this health care network of the future Networks have great potential for positively and economically impacting health care of the populations served."

The article includes graphic illustrations of buildings, technology, and process and covers the following topics:

Health network design for the 21st century
What is a health care network?
Megatrends
Humanizing architecture for health.
Basic design principles
Individual types of facilities within a health network
Scenarios of the A/E network firm of the future
A changing marketplace
International architecture for health practice.

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When Alexander Graham Bell invented the telephone, his vision was that one of the devices be in every city in a not-too-distant future. Is our current notion of health networks and facilities of the future really sufficiently bold and visionary?

The opportunities, changes, and challenges of the future are uncertain. However, existing trends in the health care industry can offer insight into how architectural and related firms will approach the design of health facilities during the next century.

The client for firms will evolve from individual and isolated health facilities to a health care network. Accordingly, architectural firms will be compelled to develop new skills, services, emphases, and organizational structures to respond to the rapidly changing needs and demands of this new client. It is our hope to present a visionary view of the possibilities of this health care network of the future. Networks have great potential for positively and economically impacting health care of the populations served.

Beyond the Hospital Model

The hospital has evolved into the core contemporary health facility, an evolution so pervasive that the very term hospital is rapidly becoming obsolete, much as earlier terms, such as almshouse, pest house, sick house, and lunatic asylum became antiquated. Health care is continually evolving, and architecture for health must adapt to the new environment and demands this brings.

The increasing demand for lower cost health services has forced the health system to rethink and redesign its facilities and networks to compete and survive in a managed care market. In addition, we now live in a society that emphasizes the broader, interactive scope, with global markets and global communications. These forces are shaping the health care facility of the future: the health network, for which the operating framework is managed care.

Every minute, every day, every year, the science and technology of health care is being reinvented in the United States. If a health care network is to survive, it will have to continuously reinvent itself just as quickly to keep up with changes in the industry. Health care networks must be more responsive to changing circumstances. Therefore, it is imperative that medical providers become truly flexible.

The Tom Peters Seminar: Crazy Times Call for Crazy Organizations is a book authorized by a leader in organizational management. In the view of Peters and many others, health care is a crazy field. If health care networks are going to survive, they will have to adopt unorthodox techniques.

Abstract Next

What Is a Health Care Network?

A health care network is made up of one or more health facilities, programs, and/or linkages working together to provide comprehensive and quality health care for a particular population, optimally at a reasonable cost. For health care networks to function effectively, the most up-to-date communication networks are required, relying heavily on sophisticated computer systems. Just as the telephone changed the world, computers are changing how health care is delivered.

Mergers, acquisitions, and consolidations are making health care delivery more efficient. Competition is constantly forcing its restructuring. Health care networks can eliminate costly duplication. Managed health care continues to grow at a rapid rate. For example, the Kaiser Permanente Plan currently has 8.8 million members. Prudential Health Care has 4.5 million members in managed medical networks. Columbia/HCA grew to a network of 340 facilities. The Department of Defense has a network of multiple facilities.


Figures 1 & 2: Managed care continues to grow. Kaiser Permanente currently has 8.8 million members.

(Click for full image)

Numerous forces in the industry are shaping the health care network of the future, providing important challenges along the way. Outside forces—including domestic and international competition, managed care, cost containment, and technology changes—all drive the need for capital dollars. Health facilities and the network of the future must address these forces with flexibility and responsiveness.

Major issues for the next century include the care of lives, customer service, operations, and facility planning. Those issues that deal with facility planning and the built environment include creating therapeutic spaces that support healthy communities. For example, good design, budgeting, and scheduling can reinforce patient-focused care and other elements that elevate and enhance the human experience of health care. Homelike environments can reduce stress and promote healing and wellness.

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Megatrends

Several factors are proving to be driving forces behind the accelerating change and evolution of the design of medical networks and facilities:

Costs and Competition

One of the principal elements behind the change is the expectations and demands of the public, the consumer for whom these facilities are built and operated and whose patronage is vital for them to survive. The priorities of a consumer are not any great mystery. The consumer wants the highest quality service for the most reasonable cost. The service must also be accessible and convenient.

In light of demand, several forces are at work to contain the expense of health care. Competition for customers provides the primary incentive to keep costs low and increase efficiency. In addition, private health maintenance companies have entered into the vacuum left by the reduced role of government in directly providing health services.

The increasing role of third-party insurance companies in the determination of fees and the location and scope of health services is another factor that contributes to cost containment. Projecting the financial feasibility of a project by analyzing and determining life-cycle costs (construction, project and annual operating costs over a 20- to 30-year period) has made ensuring the viability of the future health facility increasingly important, and health providers are adopting more sophisticated approaches to this question. For example, health networks may opt to lease buildings rather than own them.

Advancing Technology

Advancing medical technology (high tech) is perhaps the most readily apparent force for change due to its tangibility and increasing cost. The newest generation of medical diagnostic equipment, including MRI machines, CAT scanners, ultrasound, PET scanners, and numerous examples of laboratory and surgical equipment, have ushered in remarkable new advances in the treatment and understanding of deadly illness. These have also greatly increased the cost of such treatment. The future holds even more changes, such as older departments of radiology rapidly becoming imaging centers.

Figures 3 & 4: Advanced technology is a driving force behind healthcare evolution.

(Click for full image)

Computers and robotics have been introduced to the health facility, and future computerization of the operational and

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medical aspects of health facilities and networks is inevitable. Management of huge volumes of information has become critical to the success of health networks. Much of what will allow health networks of the future to function as a network are breakthroughs in digital communications, which are the hallmark and cutting edge of the Information Revolution. It is conceivable that the individual will be linked to his or her health care network via telecommunications from home, at work, or while traveling. Computers will store vital, individualized information, and give reminder calls for patients to take their medicine or schedule appointments. General health and vital signs may be continually monitored by electronic implants.

Figure 5: Computer technology will help link patients and health care providers closer together.

Remote access to and high-speed transmission of data have already revolutionized the rapidity with which information is disseminated, transferred, and received by those who are already actively using the Internet. By necessity, medical records will be fully computerized, available for immediate reference even at great distances. This quantum leap in communications occurred in the banking industry as it continued to adapt to an electronic format. Soon, health networks, if they are to function over long distances, must tap the capabilities of networking between facilities. One cost-saving application of such technology could be the concentration of the costly imaging equipment at major remote imaging centers, electronically linked to individual health facilities to give gaining greater access to the same equipment.

Remote facilities will soon be tied and integrated into health care networks by electronics and telemedicine. Digital imaging will provide clear and concise transmission of IMAGES regardless of distance. Telemedicine will allow fewer physicians and caregivers to serve more patients, scattered over larger geographic regions, first within the United States, and eventually abroad. This may even accelerate the closing gap in health care status between developed and developing regions of the world.

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The Human Touch

One possible side effect of an overreliance on technology for answers is the possibility that personal contact, caring, service, and genuine concern for sick people could lose its importance in a highly technological medical care facility. This can lead to perceptions of unapproachable and cold, inhuman institutions, which is counter to fostering a healing environment. Health networks must therefore continue to balance high tech with high touch, as John Naisbitt pointed out in his book, *Megatrends*.

Shorter average lengths of stay and improved methods of medical care are resulting in the need for more ambulatory care facilities in lieu of the previous emphasis on acute inpatient care. This will often mean downsizing, merging, and even closing many hospitals. More ambulatory care centers will be necessary to take their place.

Another increasing concern is how our society will cope with an unprecedented and growing percentage of the population over 65 years of age. The expanding population and greater life expectancy is calling for new concepts of a continuum of care, which will result in the development of new types of facilities to accommodate patients of all ages.

From a broader perspective, the emphasis on wellness can be met by an effort to combat the sensation of claustrophobia and isolation. Health facilities of the future will incorporate community-oriented indoor and outdoor spaces focused on wellness and health information.

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Models for Health Networks

It follows that in an era of such rapid change, the strategic plan will be more and more challenging to develop and implement. It will be a strategic plan for an entire health network, rather than a single institution. The architect will have to grasp the concept of, and work closely with, new health network organizational structures. What will this new innovative medical service provider facility be like?

At a very basic level, Health Maintenance Organizations (HMOs) could be considered prototypes of the 21st century health networks. Currently, approximately 140 million Americans are members of HMOs or similar managed care plans. The networks will continue to compete, merge, and consolidate as necessary. However, HMOs are not the only industry that offers ideas for what will constitute a medical network in the next millennium. Other related sectors of the economy may chose to enter the field, and by bringing their own perspectives and procedures to the process, irrevocably change health care delivery. For example, consider what would health care networks and their respective facilities be like if they were administrated by the airline industry? By AT&T? By hotel chains?

Regardless of what model is used for comparison, a health network constitutes a quantum leap forward in medical care. Networks of health facilities large and small will be tied together by ownership, electronics, continuity of image, and design. They will require massive financing and will be extremely high-risk ventures.

Humanizing Architecture for Health: Basic Design Principles

The creative and sensitive architectural firm will be able to contribute enormously toward creating a humane and caring architecture for health for the network. The following are basic design principles and concerns that health networks will have to consider.

Accessibility: The facility must be visible and accessible. Again, as the scale of a health care network goes far beyond the individual facility, the requirements for ensuring accessibility are far greater. Placement to accommodate public and community transportation as well as proximity to airports will be necessary. Closer to the facility itself, adequate and convenient parking is a must for the many patients as well as the facilities staff.



(Click for full image)

Figures 6 & 7: Humanizing health care architecture will be a must for the next century of design professionals.

Aesthetics: In accordance with the aforementioned philosophy

of high touch coupled with high tech, the aesthetics of the buildings must be conducive to the healing environment. Despite the size of these facilities, they must be on the human, not the monumental, scale. The environments contained within must be cheerful instead of clinical. The facility, from its facade to its rooms, must be an inviting and accommodating environment. This means combating the spartan, clinical atmosphere one generally associates with hospitals. Natural and indirect lighting should be used instead of harsher artificial light. Otherwise bare, white walls should be enhanced with the use of color and texture. From the exterior, the use of landscaping and gardens can also minimize the sense of institutional architecture. Success in this aspect of design can make the size and inviting atmosphere into a visual marketing tool for the health network in advertising and promoting its services.

Family-Focused Care: Often families spend extended periods of time and enormous amounts of energy caring for sick family members. The amenities for families of the patients will, as is true of everything else, have to be enlarged to accommodate the anticipated demand and use. The old pull-out cot inside the patient's room will no longer be sufficient. Among the several


Figures 8 & 9: Wellness continues to be a major component of future health care environments.

(Click for full image)

enhancements for the family's comfort and convenience, valet parking is a simple yet very useful service. More significantly, overnight accommodations and modest, yet pleasant, dining facilities will help the family of a patient feel more welcome and assist them in helping the healing process. A business and communications center will accommodate those with other significant demands on their time. Finally, exercise facilities (pool, fitness equipment, sauna, walking or running track) would be appropriate. These amenities have a dual benefit as some may also serve for the more mobile and active patients.

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The Component Facility as a Part of the Health Network

With the emphasis on networking, and recognizing that the decentralized nature of such a system is its strength, the individual medical facility will no longer need be the jack of all trades, master of none. As a component in a network, facility specialization is not only to be expected, but encouraged. This flexibility and specialization will opens up new avenues of development.

The interdependent nature of a network creates a potential to create "centers of excellence." Cancer treatment, organ transplant, cardiothoracic, and rehabilitation centers may become designated centers of excellence by health networks, and could be located at major airport hubs for ease of patient access. Hotel accommodations either adjacent or in close proximity to these centers for family members will be desirable.

The demands placed upon and the role filled by the component facility can be focused instead of diverse. Funds are finite. Realistic budgets for construction and project costs and, in particular, life-cycle operating costs are vital. In some instances, it may become more practical and aesthetically pleasing to renovate than build new. Exercising this option becomes more possible as each facility becomes more concentrated in its focus.

This diversity in center types can usher in a new wave of specialization beyond the specific procedures, but also the opportunity to tailor the facility's care to the particular needs of certain patients. Primary care will be offered in community health centers. Small, easily accessible community health facilities that are open for extended hours and on weekends will be part of the overall network. Facilities will be developed to serve the very special needs of women's and children's health. As mentioned previously, the aging population calls for facilities focused on elder care.

None of the advances in medical technology or the innovations in care have completely done away with the more traditional medical services. There will still be a need for means to provide acute care for the very ill—but now acute care will be a specialty at specific facilities. Also, with the increased incidence of trauma, accidents, and community violence, health networks will need to think about the planning, level, and location of emergency services, so that the public's needs are best served.

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Individual Types of Facilities within a Health Network

Focusing different roles of individual facilities and services raises the question of how these disparate groups will relate to one another, and hence, the concept of a network arises. This can be accomplished not only through communications technology but through the relative location of the buildings themselves.

If this approach is taken, there are a few models from which to choose. The first and perhaps most intricate is the integrated medical campus. It is intended to provide a comprehensive range of medical services, including prevention, diagnosis, treatment, and rehabilitation. A concentration of such resources will enable greater flexibility in treatment. More significant in the long run, it would open opportunities for cooperation between the disparate fields of study and research in medicine.


Figures 10 & 11: Future health care models include an integrated medical campus.

(Click for full image)

The second concept would be the so-called medical mall. Akin to the shopping mall in its day, the medical mall concept is revolutionizing health care delivery. Basic elements of the medical mall are a doctor's office building, hospital, and the support services of a pharmacy, medical supplies, restaurant, and cinema. These facilities would be surrounded by adequate parking. The last two models are the healthy village and health park models, both of which attempt to replace the sense of institution with a greater feeling of community, incorporating wellness and fitness concepts.

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Scenarios of the Architectural/Engineering Network Firm of the Future

Scenarios in their simplest form can be defined as integrated pictures of how the future might unfold. Exploring scenario trends allows us to gain insight into patterns of change over time, awareness of emerging health care challenges and opportunities, and the opportunity to consider a broader range of possibilities than is usually possible in traditional strategic planning. Scenarios also offer an imaginative framework for clarifying our highest aspirations and vision of the best that might be, and for exploring strategies to achieve the vision.

Part of the scenario development process encompasses an examination of key forces. These are major factors occurring in our environment that will affect how the future unfolds. The nature of the key forces can be categorized as social, technical, economic, ecological, and political. Scenarios are less about predicting or forecasting the future and more about challenging our mental models and assumptions. In turn, scenario development is not about trying to paint an accurate picture of tomorrow, but about making better decisions today about our future. The variety of health care design firm scenarios for the future include megafirm, alignment, collaborative, and independent.

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Organization of the Architectural/Engineering Firms for a Health Network Era

As architectural and engineering firms move forward and adapt to meet the demands and fulfill the designs of the health network of the future, they will have to adapt to the special needs of their client. The architecture-for-health firm of the future will itself also be organized as a global network in order to practice globally and to serve global health network clients.

Part of this expansion to a broader scale will be accomplished by large firms partnering with smaller firms in joint ventures, and by relationships between private firms and universities to carry out research and design projects. These relationships will also result in recruitment of newly graduated architects into architectural and engineering firms specializing in health facilities. Large architectural/engineering firms will be centralized as well as decentralized. Support activities such as education, information, administration, contracts, publications, corporate image, and quality standards will be centralized. Regional offices working with smaller firms and affiliated with universities will be decentralized.

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A Changing Marketplace

In the future, health care architects and the firms they represent, must look beyond the design of individual facilities with the understanding that they are serving strategically driven health care networks. Rather than being concerned with narrowly defined boundaries of service, they must establish alliances with whatever disciplines are necessary to anticipate and meet the needs of an ever-changing health care customer.

Health care systems will continue to be faced with shortened productivity cycles, tighter focus on the bottom line, and, in many cases, the outsourcing of services and facilities that are not integral to their care mission. In such an environment, architects must evolve from managing projects to serving a variety of facility and non-facility accounts within the health system. There will be a growing need for a broader range of services including site selection and analysis, facilities management, and real estate and asset coordination, as only a few examples.

Figure 12: Health care architects will provide multi-disciplinary customer-centered services.

Health care architects will become stakeholders with an intimate understanding of the health network and its mission. They will strive to establish long-term (life-cycle) relationships with health care systems, built on trust and calling upon a single source of responsibility for a broad range of services. For example, just as the health provider emphasizes preventive medicine, the health care architect may offer preventive architecture consisting of periodic "facility checkups," with the emphasis on long-term operational and economic improvement.

Essentially, in the future, health care architects will provide multi-disciplinary, customer-centered service that is no longer related only to building projects. The future focus will be more on multi-generational life-cycle of facilities as it relates to ever-changing patient needs. The health care architects' service will not stop with the ribbon cutting.

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A/E Network Firm of the Future Partnering

In a market economy, the design professional must provide a management program that partners with all other organizations in the design process to speed project delivery while retaining quality. Architecture firms will also plan and design for a continuum of care. The design team will become part of the culture of the health care network, with the ability to act as an arm and an extension of the owner. Efforts will be made to streamline operations in all aspects of facility design, including ambulatory care, inpatient acute care, and extended-care facilities. Finally, return on investment will be required so that the network can continue to be a viable concern in the business of health care.


Figures 13 & 14: Growing population, environmental and health needs will create international health care opportunities.
(Click for full image)

International Architecture for Health Practice

Growing population as well as environmental and health needs will create greater demands and opportunities for an international practice in architecture for health. By the year 2020, the population of the planet is estimated to reach 9 billion. Consider the health networks and facilities that will be required to meet the needs of so many people. Architectural and engineering firms will be compelled to adapt to the greater demands of the client. The magnitude of projects in a global network era will be staggering, and competition among global architectural/engineering networks will be fierce.

Conclusions

We are entering into a new era. Past challenges involved the design, construction, and operation of individual health facilities for individual clients. Future challenges involve the conceptualization, design, construction, and operation of entire health networks. These networks are engaging in fierce competition, and may be made up of two or hundreds of linked health facilities scattered all over the world. Financing, organization, communications, technology, design, construction, and operation will become ever more complex and expensive. The days of designing individual health facilities will be in the past. The new era and the new client will be global health networks. The challenges in effectively undertaking global health network projects will be enormous, and so will the financial stakes.

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Figure 1
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Figure 1: Managed care continues to grow.
Kaiser Permanente currently has 8.8 million members.

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Figure 2: Managed care continues to grow.
Kaiser Permanente currently has 8.8 million members.

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Figure 3: Advanced technology is a driving force behind healthcare evolution.

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Figure 4: Advanced technology is a driving force behind healthcare evolution.

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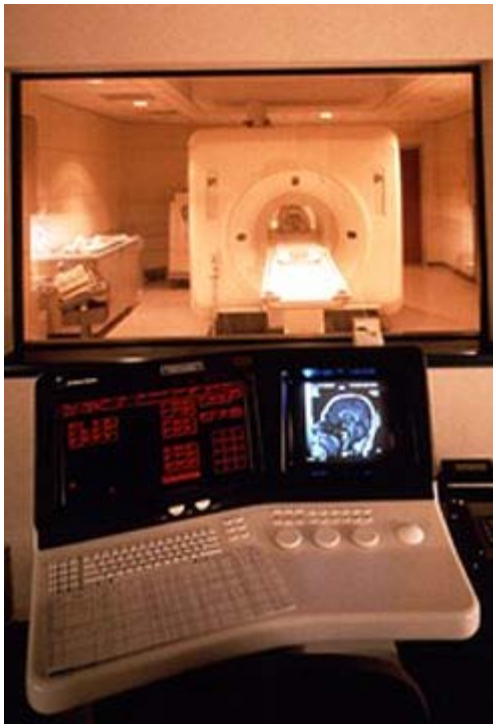

Figure 5: Computer technology will help link patients and healthcare providers closer together.

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Figure 6: Humanizing healthcare architecture will be a must for the next century of design professionals.

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Figure 7: Humanizing healthcare architecture will be a must for the next century of design professionals.

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Figure 8: Wellness continues to be a major component of future healthcare enviornments.

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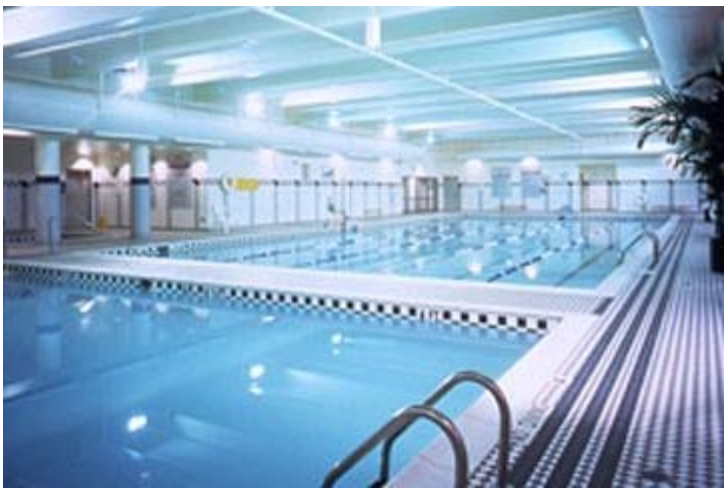

Figure 9: Wellness continues to be a major component of future healthcare enviornments.

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Figure 10: Future healthcare models include an integrated medical campus.

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Figure 11: Future healthcare models include an integrated medical campus.

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Figure 12: Healthcare architects will provide multi-disciplinary, customer-centered services.

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Figure 13: Growing population, environmental and health needs will create international healthcare opportunities.

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Figure 14: Growing population, environmental and health needs will create international healthcare opportunities.

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This article originally appeared in The Academy Journal, published by the AIA Academy of Architecture for Healthcare (volume 1, part 1 – October 1998).