

Restoring the Human Scale:

Healthcare facilities will be designed as living spaces for families, not warehouses for sick people.

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Unlike nature, which makes provisions for animals that outgrow their skins to shed them and grow new ones, societal institutions seem to lack an easily programmed path of evolution. Outdated forms and frameworks far outlive the needs they were intended to meet and constrain and handicap efforts to adapt to new needs.

This is nowhere more vividly apparent than in the design of health facilities.

Healthcare delivery is being fundamentally reshaped not only by rapid advances in our understanding of disease processes but by new diagnostic and therapeutic modalities that sharply lower the morbidity caused by treatment. We better understand the origins and natural history of disease: we have been enabled by biomedical science to intervene earlier and earlier in disease processes-before they render patients acutely ill.

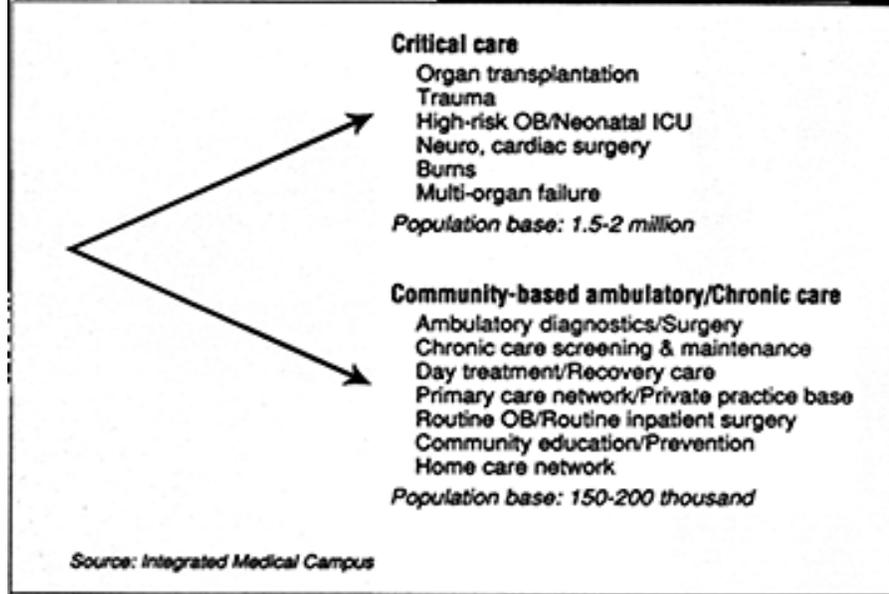
These advances have dramatically decreased the frequency of hospitalization for persons with acute illness in the US and sharply reduced mortality rates for seemingly intractable chronic diseases like coronary artery disease and many forms of cancer.

Even with an aging population, the custodial role of healthcare provision is giving way to an enabling empowering role in which physicians use new drugs new technologies, and most importantly their own knowledge and moral authority to assist patients and their families in managing their health risks.

As the center of gravity in healthcare shifts into the ambulatory and subacute arena, contemporary health facilities design remains prisoner of an outdated model of interaction between physicians, patients, and their families. That model assumes that the exigencies of disease require healthcare professionals to take custody of patients for extended periods of time removing them from their families and communities until they have defeated the illness and restored their vitality.

Grim functionalism

The hospital facilities traditionally designed to meet this custodial - mission looked far more like factories or prisons (whose administrators are tellingly called "superintendents") than humane institutions. External aesthetics and synergy with the neighborhood and environment were sacrificed to grim functionalism and the dictates of the hospital's labyrinthine professional bureaucracy.



Not even a cursory effort was made to accommodate the human scale; hospitals seemed deliberately designed to dwarf and render insignificant those who used them. Some facilities built in the early Eighties even looked like gigantic alien spacecraft!

As new technologies or services evolved, they simply sprawled in new wings and when facilities ran out of site, their “planners” simply shoehorned new services like ambulatory surgery or radiation therapy into whatever basement space became available. The least powerful participants or most recently arrived technologies ended up in trailers!

For larger institutions, like many teaching hospitals, the incomprehensibility of the physical structure grew to the point where several years employment could elapse before an employee could render clear directions to new visitors.

We recall the pathos of a senior executive at a major teaching institution actually bragging about the marvelous new computerized system they installed in their hospital that printed out the 20 steps new patients needed to take to find their doctor! For these brontosauri, the path to the tar pits will be paved with computerized instructions.

The new markets

Acute illness and life-threatening trauma will not disappear from the healthcare landscape. For these classes of illness, a custodial model may still be appropriate. But how that model is housed and clothed, and how the hospital's professionals relate to each other and to the patient and family will fundamentally change.

Out of the undifferentiated market for acute care are emerging two distinctly different new markets: critical care and community-based ambulatory and chronic care (see above). Critical care is organized around team-based care to desperately ill patients by highly specialized physicians and other caregivers.

The functional departments of the traditional hospital (nursing, social work, dietary) become far less relevant to the organization of critical care than the critical condition itself. For example, today's trauma patient may transit multiple departments (such as emergency, radiology, surgery, postsurgical recovery) and be handed from group to group in the hospital before stabilizing.

Emerging technologies will eliminate the need for much of this movement, elevator rides, and passed (sometimes dropped) batons. For example, General Electric's Medical Systems planners have envisioned MRI units with bores large enough to operate inside of. Thus, the patient with severe head trauma will pass through the evaluation area (formerly the emergency room) of a trauma facility into an acute intervention room that houses surgical capacity with real time, 3-D. or holographic imaging.

The surgeon and team will be able to operate with contemporaneous imaging, rotating the image to assure that the bleeding is stopped or all the bullet fragments are removed. The patient will then transit into a critical care stabilization unit without leaving the trauma unit, enabling the same clinical team who took the patient in and saved his or her life to monitor the recovery.

Similar units are being constructed today for cardiac patients-acute intervention rooms where the patient with a myocardial infarction receives thrombolytic therapy or angioplasty. If the patient requires cardiac surgery, the room converts in five minutes to an operating room; it isn't necessary to move the patient. Tomorrow's catheterization laboratory will not be a diagnostic tool (as cardiac diagnosis will eventually be almost completely noninvasive) but rather a tool for saving lives.

While the critical care market is creating new demands, the far larger portion of yesterday's acute care is dissolving into a new market, ambulatory and chronic care services -- that is, subacute or short-stay care for earlier-stage disease. Many of the highest new technologies such as MRI and cold lasers are migrating into this setting, making it possible to treat complex disease without separating patients from their families for more than an hour or two.

Now design principles

These new services will become the central focus of the community hospital of tomorrow, and they will be organized around the following completely different design principles:

Family-centered care. The real "patient" is a family not the isolated person with disease. Facilities will be designed as living spaces for families, not warehouses for sick people. They will accommodate not only the traditional ambulatory visit, but four-to-eight-hour treatment "modalities (for diabetes or cancer) as well as one-to-three-night stays for those who are not acutely ill but who are too uncomfortable to go home.

Patient rooms will be "family rooms," a concept already accepted in modern pediatrics (parent care) and central to modern obstetrics (birthing).

This concept of family-centered care is finding increasing applicability to post-operative stays (recovery care) and even to acute rehabilitation. The primary caregiver is the family member, and the job of the patient care team is to educate and support the family member, and to provide the safety net if the patient's condition unexpectedly deteriorates.

As a consequence, rooms will be designed with more than one bed or sleeping area and will contain refrigerators, microwave ovens, and other amenities common to hotels. Room sizes may increase to twice that of the typical semi-private room.

Planning for these new facilities must accommodate much longer stays by those who are not ill and provide spaces for privacy, escape, counseling, treatment planning, reflection, and easing

of tension. This is obviously much easier to accomplish in a low-rise campus environment than a high-rise tower.

New facilities must also accommodate children (who were absolutely forbidden to enter many hospitals as few as five years ago) with play areas and daycare capacity.

The ambulatory patient rarely comes to the hospital alone. Site planning and room design must stretch to become wellness and healing environments, not just space to exclude the elements and house the technological wonders of man. The family is the forgotten actor in the contemporary healthcare system.

Team care, not "topgun." The doctor side of the traditional doctor-patient relationship is changing just as rapidly as the patient side. The real doctor for a chronically ill elderly patient today is not merely the primary care physician or specialist in the relevant chronic disease but the multidisciplinary team on whom that physician relies for advice and management help. Diabetic care, cancer care, rehabilitation, and increasingly cardiac care is being organized along this model.

To function effectively, the workspace of these professional teams must be designed to encourage easy and spontaneous interaction. Professional offices of related subspecialists should be located together. The real purpose of the modern cancer center is not to house the linear accelerator but to move the medical, surgical, and radiation oncologic offices into the same building with the allied health professionals who, in many cases, actually run the treatment.

At the same time, the diagnostic and therapeutic workshops of these professionals should be, to the maximum extent possible, co-located with their offices, so that easy transit from the office to the workshop can be made. These workshops need to accommodate not only technology, but space for informal consultation and conferencing as well as for interaction with family members before and after evaluation or treatment.

Zoning. For institutions with multiple levels of care occurring on the same campus, zoning becomes critical to preserve a low-stress environment and ensure privacy. Healthy patients and their families should not, ideally, have to cross paths with those who are near death. The healthcare campus should serve to diffuse anxiety, not create it.

Complex healthcare institutions will always have multiple constituencies, whose needs for support and a caring environment differ meaningfully. Lowering physical barriers to access (such as grade changes, long corridors, and decentralized care sites) becomes particularly important for the elderly or impaired patient.

Design principles and environments should be standardized for an impaired 70-year-old woman, not a healthy 30-year-old man. Simple design considerations such as lever hardware on doors, easy location of controls in kitchens, and redesign of the typical bathroom in every aspect enhance the safety and convenience of the inhabitant.

Flexibility and safety. Design for flexibility in future structures must go beyond the normal thinking (no load-bearing walls, large structural bay sizes, and adequate floor-to-floor heights). New structures must easily accommodate new technologies and enable rapid and low-cost reprogrammed usage.

A special safety net must be created within the high-tech structure that stretches to include the mechanical, electrical, communication, and other related subsystems. Building codes must be revised to enable more flexibility to accommodate the rapidly changing technology in healthcare structures. Life safety of the occupant must become the central purpose of the codes while allowing more mixed-use occupancies and not driving the cost of building needlessly upward.

Productivity improvement. Health facilities design must anticipate more effective management of clinical and financial information related to patient care. Designers should not assume the continuation of paper-based clerical functions requiring huge records storage areas and carrels for filling out forms.

The Nineties will see the emergence of many technologies that will eliminate clerical tasks: digital archiving and transmission of radiologic images, laser disc storage and retrieval, and the wedding of voice recognition and expert systems. Lobbies that look like Greyhound bus stations will give way to concierge areas, where new patients are issued electronic "pass keys" coded with their appointments, mini-medical records, and financial information.

The health facility of tomorrow will have to run on regular gas. Not only must fixed costs be held down by efficient selection of materials and intelligent technology investments but economy of operation must be engineered into tomorrow's healthcare facility.

The human scale

We have attempted to apply these design principles to accommodate the new program structure of the community hospital of tomorrow. The illustrations on these pages show an attempt to create living, and working space for ambulatory and subacute patient care that preserves the human scale. Not all providers will have the luxury of starting from scratch with a commodious site, or be able to knit their facilities together with an atrium.

The examples illustrate all of the principles discussed here as applied to a new location. The special problem of the automobile has been accommodated by making the auto disappear underground, but remote parking and shuttles can accomplish the same task at far lower cost.

Health facilities planners and architects face a special challenge in the next 20 years: They must liberate themselves from the custodial mindset of the twentieth-century hospital. They must find the courage and daring to give new expression to the caring at the heart of health services and find a new accommodation with the families and communities who rely on those services. Health facilities must be more effectively woven into the fabric of the communities they serve while supporting and nurturing the revolution in diagnosis and treatment that will continue to reshape the healthcare scene.

The illustrations on the following pages reflect the authors' vision for the two models of care of the future. Both are designed to be evolutionary. At the upper right is the "young" model, which includes the less intensive services. Below it is a zoning and traffic flow plan with color codes showing phases of care from less to more intensive. The "mature" facility model at top, this page, houses acute-care services. The third image is a patient room. Most of the design elements shown here are incorporated in actual healthcare facilities now under construction.

