

# **Health and the Built Environment: Drawing Parallels and Inspiration from the New Integrative Medical Model**

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## **Abstract**

This position paper examines the potential of the integrative medical model to support holistic design in the built environment. Based on a new approach to human health, the integrative medical model calls for the delivery of health care services that address the social, psychological, spiritual, biological, and physical needs of patients. Thus, the practice of medicine has gone beyond a primarily focus on the physical and biological components of disease to a broader emphasis on phenomenon that are less tangible, but equally important, in the maintenance of health. A parallel exists in the built environment. Historically, the construction of buildings and the layout of neighborhoods have relied on engineering qualities (principally physical and biological) related to building form and function. However, it is well known that our most livable neighborhoods have social, psychological, and at times, even “spiritual” qualities assigned to them—making them attractive, restorative, & vibrant places to live and work. This paper proposes to develop and apply criteria derived from the integrative medical model to create performance standards for the built environment.

**Keywords:** Integrative Medical Model, Built Environment, Performance Standards

## **Introduction**

All academic disciplines and professional practices undergo paradigm shifts as accumulated data or chance discoveries refute orthodox beliefs and/or practices of the day. Recorded medical history is no different. Over the past 6,000 years, a series of paradigm shifts dramatically have affected the contemporary medical practices of the times. However, discoveries made over the past 125 years, in germ theory, genetic mapping, and immunology have revolutionized modern western medicine and have set the stage for the newest medical paradigm—the integrated medical model (Porter, 1997, 1996; Guzzetta and Dossey, 1992; Cartwright, 1977; Stubbs, 1931; Garrison, 1913).

This new medical model calls for balance among, and integration of, social, psychological, spiritual concerns with traditional physical, and biological signs/symptoms in the control of disease and the promotion of health/wellness. Historically, technological discoveries supported and focused traditional medical treatments of disease on purely physical or biological phenomenon; the new paradigm demands that physicians address social, psychological, and even spiritual, underpinnings of disease and/or wellness. As a result, traditional medical approaches to managing patients have shifted from a practice dominated by pharmaceuticals, surgery, and/or

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radiation therapy (i.e., treatments largely designed to address physical or biological disease processes) to broader models of human health. Discussions of whether or not physicians should be incorporating spiritual histories in medical records (Koenig, 2003; Elkington, 2003) and dialogues about non-traditional medicinal use and practices as a complement (or potential conflict) to orthodox medical practices (Yuan and Bieber, 2003; Moss, 2003; Ernst, 2000) have become more commonplace in the medical literature.

The new paradigm has some of its roots in phenomena-centered science. The early writings and applications of Rudolph Steiner (Steiner, 2000; Creeger, 1999; Evans, and Rodger, 1992; Husemann and Wolff, 1982) on anthroposophic medicine; Johann Goethe's (Goethe, 1993; Naydler, 1996) work on morphology and science; and the early physiology experiments of Pfluger (1877), Bernard (1878), Fredericq (1885) and later Cannon (1925, 1926) who established the concept of homeostasis, served to create the philosophical and scientific basis of the paradigm. Modern medical scientists like Herbert Benson (Benson, 1975, 1996; Benson and Stuart, 1993), and the Dosseys (Dossey, et al, 1995; Dossey, 1991, 1993) have pioneered research in mind-body medicine. NIH scientist Ester Sternberg (Sternberg, 2000) has begun to establish the biochemical underpinning between stress and the environment. And medical epidemiologists, like David Eisenberg (1993; 1997), have studied phenomenon related to popular use of alternative medicine for NIH. Data showing strong cause and effect relationships between the context in which one lives, works and recuperates, longevity, and general measures of health are slowly coming forth (Galbraith and Westphal, 2002; Herzog, et al, 1997; Thomas, 1996; Syme, 1993; Hartig, 1993; Hartig et al, 1991; Ulrich, 1984; Ulrich et al, 1991; Francis and Cooper Marcus, 1992). With improvements in methodology and technology, research scientists will make significant strides in measuring the less tangible, multi-dimensional variables that mark the social, psychological, and spiritual domains of health in the broader paradigm.

The integrated medical model's influence has affected the health care delivery system already. Physicians, along with nursing staffs, and institutional administrators, have begun to address the special needs of patients. "Patient-centered care" in hospital, extended care facilities, and nursing homes is quickly becoming the standard of care in the industry. This position paper asks the simple question "Can we take this model out of institutional settings and apply it to all aspects of the built environment"? The answer to this question may determine whether a new norm, that is more holistic to health, is possible for all segments of the American public in the built environment.

### **Application to the Built Environment: Current "State of the Art"**

Recent grass-roots movements in the building construction industry and the specialty design fields have set the stage for the possible integration of the new medical model into the built environment. Work by the U.S. Green Council, through the LEEDS<sup>2</sup> certification process, has set as its goal the creation of buildings that are environmentally sustainable, non-toxic, and energy efficient (Table 1). In many respects, the Council's conscious effort to protect the natural environment also has inadvertently addressed many of the physical and biological health concerns expressed by occupants of the built environment. For example, better air filtering and

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<sup>2</sup> Acronym for Leadership in Energy and Environmental Design Sustainability

Table 1. A synopsis of critical components in the LEEDS building performance ratings (Westphal, 2003).

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1. Water Management Criteria

Storm water management to decrease storm water discharge

?? Green roofs

?? Collection cisterns

?? Bioswales

?? Wetland construction

Irrigation management

?? Gray water separation

?? Collection cisterns

?? Xeriscaping; minimal irrigation

Bermed and raised beds

?? Gray water treatment

Constructed wetlands

2. Building Material Selection Criteria

Indigenous materials

Sustainable certified forest products

Recycled content materials

?? Metals

?? Concrete

?? Insulation (paper)

Porous paving materials

?? Asphalt

?? Soft-scaping products

3. Energy Performance Criteria

CFC to zero

HFC to zero

Commissioning HVAC

Alternative energy systems

?? Photovoltaic

?? Wind entrapment

?? Bio-methane

Orientation of Trees, plant materials

Increased reflective roof materials

4. Indoor Air Quality Performance Criteria

Decreased pollution sources

~~✗~~ Off-gas pollutants

~~✗~~ Increased air exchange

Monitor CO<sub>2</sub>

Digital HVAC systems

Daylighting

Table 1. (cont.)

5. Site Minimum Performance Requirements

- Available public transportation
  - Bus stop
- Increased amounts of green space
  - Restoration
  - Mitigation
- Ambient Temperature Control
  - Increased shade
  - Light colored materials
  - Xeriscaping
    - Native plant materials
    - Naturalized plant materials
- Zero light pollution
- Minimize site alteration
- Utilization of brownfield sites
  - Reclamation
- Increased pedestrian use
  - Bicycle paths
  - Changing rooms for %5 working population
- Storm water Control
  - Porous paving
    - Parking areas
    - Road system
- Absence of curb and gutter

circulation systems, along with building materials that do not support micro-organism growth and the “sick-building syndrome”, have come out of the movement. Likewise, human toxicity, secondary to the emissions emanating from pressure treated lumber, solvents/paints, fabrics/floor coverings, and other building materials, have produced more healthy physical environments both within and outside of the built environment. At issue is whether we can document the health benefits of other aspects of this movement—e.g., alternative energy sources and decreased air pollution; sustainable forestry and improved soil and water conservation; waste water and landfill alternatives and cleaner groundwater and surface water quality—and expand the effort to include a broader set of concerns affecting the social, psychological, and spiritual health of occupants. For example, physicians often prescribe board spectrum lighting for patients suffering from Seasonal Affective Disorder (SAD), a consequence of shorted photoperiodicity in the Northern Hemisphere in Fall or the Southern Hemisphere in Spring. Orienting and constructing buildings to optimize the amount of sun exposure during these periods of the year could have a positive psychological boost for occupants; supplementing natural light with broad spectrum lighting in winter would complement the scenario further. Other aspects affecting the social and psychological health of occupants often surround issues of control and choice. Could the US Green Council begin to incorporate as a part of the LEEDS criteria ways to increase and complement individual decision making in the use of space? Could this increase flexibility improve the opportunity for social interaction, privacy (when needed or desired), heightened self

esteem, and greater appreciation for the environment through clever, consciously designed and constructed environments. Could we in fact, design built environments that are not only environmentally sound but aesthetically inspirational as a standard practice rather than the exception to the rule?

Designers in architecture, landscape architecture and urban design have sought ways to increase the therapeutic benefits of designed space and structures. Work by the AIA specialty branch in health care design and the American Hospital Association (Carpman and Grant, 1993) continues to improve hospital and institutional design that facilitates patient-centered care and promotes wellness among all user groups in a built space. Landscape architects have addressed the healing abilities of gardens, landscapes, and natural environments to reduce stress, facilitate healing, and improve personal perceptions of well-being (Galbraith and Westphal, 2002; Cooper-Marcus and Barnes, 1999; Gerlach-Spriggs, et al, 1998; Tyson, 1998). The “New Urbanist” movement that has marked community design over the past decade is the planners’ contribution to creating livable, sustainable cities. Underlying the new urbanist approach is an appreciation of the need to encourage and maintain social diversity, conserve open space, and promote walkable, sustainable, humanly-scaled environments.

All of these movements are intended to improve health at various scales—i.e., personal health, community health, ecosystem health. However, each is operating in its own sphere of influence and addressing only those concerns that appear applicable to the mission of each profession. A broader, more holistic approach needs to be considered and advanced. What should this approach entail? I would encourage movement away from a “patient centered environment” to a “health centered environment” that benefits all Americans. I would encourage the integration of these various efforts into an over-arching philosophy related to the design, construction, and maintenance of the built environment. The approach would require that all building proposals, at all scales, and for all purposes contribute to the human and environmental health of the nation. It would require that all products of the built environment are sustainable in the worst case scenario and regenerative in the best case scenario. And it would call for the creation of design principles and practices that are shown to promote the integrative medical model that has been put forth by the medical community and that is currently being supported at least in part by the green architecture movement.

As a licensed, practicing physician and landscape architecture, I see the possible future of health care delivery going back to private residences within livable, environmentally friendly communities. To be successful, it will have to take a comprehensive, albeit somewhat novel, approach to health maintenance and disease prevention. Just as modern medicine has acknowledged the need to go beyond the tangible, measurable, environment to understand factors affecting human health, those of us working in the built environment need to embrace the broader, integrative medical model that currently serves the medical community and apply it to our work. It is likely that such an application has the potential of creating in the built environment a “placebo effect” (i.e., the creation of structures and open spaces that nurture and promotes human health and well-being through support mechanisms vested in the five factors of the model.) If we use the new, integrative medical model to guide our work as creators of the built environment, we could become an encompassing and positive force in creating healthy, livable environments.

Promoting the five factors found in the integrative medical model will require that we actively demand proposed built environments (at all scales) to be evaluated for their impact on human health before development is permitted. This will take a coordinated effort between public health and government officials, medical practitioners, and design and planning professionals. It will require research to establish the standards and criteria that go beyond the physical and biological demands for space and/or materials performance requirements. It must include considerations of social space, psychological needs, and spiritual qualities of space that transcends stages of the human life-cycle and actively promotes health and well-being among all sectors of the American public. New proposals for development must be evaluated on these broader, more inclusive factors that are known to promote human health. If done correctly, such an approach has the potential of creating *de facto* a pro-active health care delivery system through the built environment that becomes our homes, neighborhoods, and communities in the 21<sup>st</sup> century. Such sensitivity acknowledges man's place in the broader ecosystem of life, and it insures that future generations of Americans live well within the ecological limits of our natural resources.

### **Future Research Directions**

As in all scientific investigations, a comprehensive review of the literature should initiate the study. This will be used to identify areas where the integrated medical model is currently being addressed in construction practices and community design that promote human and ecological health and well-being. Through a series of "round-table" discussions across the country, clarification of existing standards and criteria that promote ecological sustainability must be evaluated in terms of their ability to promote and advance human health. New standards and criteria must be developed for evaluating other factors of the built environment that are less tangible and easily measured—social needs, psychological outcomes, spiritual benefits—but are known to contribute to human health. These new standards must be tested and evaluated for their efficacy using a variety of instruments, including standard medical scales as well as technologically advanced bio-feedback mechanisms. New ways of thinking about, and promoting human wellness, through community design and architectural innovation, need to be encouraged and tested against the changing physical, biological, social, psychological and spiritual demands of the human life-cycle. Needs versus demands, cost versus benefits, refurbishment versus replacement, must be evaluated in terms of proposed changes in the design and construction of the built environment for health purposes.

The most basic question to consider under the focus area of "Housing, Technology, Community, and the Economy", and its subheading of "health and the environment", is whether the new integrative medical model has merit in terms of providing a paradigm and source of inspiration for creating healthy citizens and viable communities.

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