

# Green Medicine: An Integral Approach That Benefits Physicians, Patients, Communities, and the Environment

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Healthcare in the United States continues to face numerous challenges, including inaccessibility of services, rising costs, and medical pollution, as well as an increase in environmentally related illness.<sup>1,2</sup> In fact, the World Health Organization's *Millennium Ecosystem Assessment 2005* found that 25% of the world's burden of disease comes from poor environmental quality and that 60% of the benefits we receive from environmental resources are being degraded rapidly because of unsustainable management.<sup>3</sup> Simply put, the world in which we live is losing its capacity to keep us well. My belief is that the field of medicine and healthcare can provide the leadership necessary to foster a healthier environment, one that will allow us to live well today while letting others live well tomorrow. While this task is often left to environmental activists, I believe health professionals have the opportunity to play a leading role in shaping the environmental health of our future. The concept of "green healthcare" offers us the means to realize this vision.

What, you may ask, is green healthcare? This term describes practices that facilitate a sustainable future for medicine, physicians, patients, and the environment. Practically speaking, green healthcare has 3 components: 1) working in a healthy facility (or green clinic), 2) advocating for a healthy environment, and 3) practicing medicine in a sustainable manner. To be clear, the word *sustainability* means living in a way that also lets others live well, both now and in the future. Green healthcare allows medicine as a practice to promote health for people, communities, and the environment.

But how does one go about incorporating the principles of green healthcare into a busy medical practice? The guidelines offered in this article are intended to help you take the first steps.

## Green Healthcare as an Integral Approach

Medicine as practiced in modern times is hyper-focused on the mechanics of the body. Research methodologies offer us objective findings on the most-effective therapies, and epidemiological studies provide us with up-to-date information about how well our system of healthcare is working. As complementary and alternative medicine (CAM) therapies find their way into mainstream medicine, integrative medicine offers patients and practitioners the option of considering more than 1 model of health and disease. However, integrative medicine does not necessarily consider the environment when looking at the whole person. In fact, integrative medicine often overlooks the impact of the environment when considering the patient as a whole.

An opportunity exists today for healthcare to embrace a powerful tool, called integral theory or integral methodological pluralism, which was developed by leading philosopher Ken Wilber.<sup>4</sup> Wilber's integral theory utilizes a 4-quadrant framework that facilitates a balanced integration of objective and

subjective perspectives, as well as the individual and collective faces of human experience and knowledge.<sup>4</sup>

To better understand the 4 quadrants pictured in Figure 1, below, imagine a woman who has breast cancer. Suppose she is an immigrant and a single mother who lives on a limited income. The objective-individual quadrant (upper right) considers the woman's body and the cancer and may include her genetic predisposition to cancer and her poor nutrition. The subjective-individual quadrant (upper left) focuses on the perspective of "I," which is made up of the woman's personal experience and psychological factors, her experiences of stress and her anxiety. The exterior-collective quadrant (lower right) considers social factors such as her lack of access to medical care and exposure to chemical toxicity in her work and home environments. Finally, the interior-collective quadrant (lower left) includes her cultural experience, such as a norm that emphasizes her role in caring for others before taking care of her own health or her belief in a certain type of medicine or healing method that has been handed down for generations.

Thus, integral theory provides a model that allows consideration of numerous factors affecting this patient. It offers a balanced view that includes all perspectives on her condition, including genetics, psychological disturbances, chemical toxicity, and cultural self-neglect. Her disease results from many or all of these factors.

**Figure 1.** The 4 Quadrants of Health and Disease

	Subjective-interior	Objective-exterior
Individual-singular	<b>I</b> <i>Personal experience</i>	<b>IT</b> <i>The body, the disease</i>
Collective-plural	<b>WE</b> <i>Cultural experience, norms and values</i>	<b>ITS</b> <i>Physical environment, social structures</i>

Medicine as practiced today focuses almost entirely on the upper right quadrant, or the realm of objective-exterior (see Figure 2). Integrative medicine considers the upper-right as well as the upper-left quadrants (see Figure 3). The upper left is the realm of experience, which is subjective and thus an interior aspect of the patient. However, at times integrative medicine fails to recognize the lower quadrants, or collective perspectives. Environmental medicine focuses primarily on the right side (see Figure 4), considering toxicants in the environment (lower right) as well as their effect on the individual (upper right). Public health focuses mostly in the lower quadrants (see Figure 5),

considering cultural issues, community health (lower left), and the environmental structures that maintain these patterns of population sickness (lower right).

**Figure 2.** Conventional Biomedicine: focused predominantly on the physical health of the patient

	Subjective-interior	Objective-exterior
Individual-singular		✓
Collective-plural		

**Figure 3.** Complementary-Alternative Medicine: focused on health of the “whole” patient (including physical and mental-emotional factors)

	Subjective-interior	Objective-exterior
Individual-singular	✓	✓
Collective-plural		

**Figure 4.** Environmental Medicine: focused on the health of the patient and environmental factors

	Subjective-interior	Objective-exterior
Individual-singular		✓
Collective-plural		✓

**Figure 5.** Public Health: focused on the health of communities and populations (including cultural and structural factors)

	Subjective-interior	Objective-exterior
Individual-singular		
Collective-plural	✓	✓

An integral approach distinguishes itself by requiring consideration of all 4 quadrants in solving any health problem: the body, the person’s mental and emotional well-being, cultural influences on health and disease, and the social structures and environmental factors that contribute to health and disease. In the example of the woman with breast cancer, an integral approach to treatment would suggest utilizing chemotherapy, counseling, and support groups as well as reducing environmental toxicity.

The green healthcare model offered in this article is an integral approach—uniquely so, because it not only considers all 4 quadrants, it also addresses 3 levels of complexity: personal,

social, and environmental. The addition of the lower or social quadrants encompasses the impact of the environment on personal and population health as well as the effect that healthcare has on ecosystem health.

**Green Clinics and Green Hospitals**

A healthy work environment is essential in order for health-care not only to care for its own but to model for society at large the value of a healthy environment maintained according to principles of sustainability. In the last 10 years, the green building movement has emerged as a rapidly growing sector of the building industry. Essential principles of green building are to create a workspace that is healthy for the occupants of the building, healthy for the local community in which the building resides, and sustainable for the long-term health of the global environment (see Figure 6).

**Figure 6.** Green Hospitals: focused on healthy hospital buildings

	Subjective-interior	Objective-exterior
Individual-singular		
Collective-plural		✓

So successfully has the sector grown that more than 115 pilot projects representing 30 million square feet of construction are currently underway in the United States and abroad.<sup>5</sup> Thanks to the work of Hospitals for a Healthy Environment (H2E), a co-sponsor of the publication *Green Guide to Health Care*, the not-so-distant future might include hospitals built without polluting the environment, or, rather, hospitals designed with the intent to limit the footprint of construction and operations. Green hospitals are built using sustainable technologies and operate with a commitment to energy conservation, solid waste reduction and recycling, water conservation, and pollution prevention. Hospitals built this way will be able to operate in a much more sustainable fashion in terms of energy use and pollution.

For many, working in a green clinic is less about building a new building than giving attention to the environmental consequences of work habits for both the professionals and patients using the facility. Energy and water conservation, pollution prevention, solid waste reduction and recycling, healthy occupational habits, and a commitment to a supportive workplace community are all essential. For patients, access to public transportation, take-back opportunities for unwanted medications, and community information events offer tangible benefits. Learning to live and work within the means of the local environment is essential for a sustainable future. When created in a medical setting, we model how our built environment can provide the necessary ingredients for healthy living.

**Promoting a Healthy Environment**

A healthy relationship with the local community requires a

shift in the way medicine is practiced. Integral healthcare providers are in a unique position for promoting the value of a healthy environment. The growing concern about environmental illness and toxicity can best be addressed through practices that draw attention to the local environment's health, and a great way to serve the health of patients and the community is to keep informed about any local environmental health issues. Connecting locally with public health departments, governments, and environmental agencies provides opportunities for collaboration among all parties with an investment in public health. In particular, portal-of-entry providers such as those in the medical profession can greatly benefit from this type of collaboration.

With the emergence of global climate change, it seems that most consumers, businesses, and governments are more attuned to the damage caused by the declining health of the environment.<sup>6</sup> Thus, patients are ready to receive possible solutions. And physicians and other providers will increasingly be required to recognize environmental illnesses.

The cross-disciplinary dialogue is touching experts in environmental medicine and public health as well as citizen groups. A case in point is the situation in West Oakland, California, where a child is 7 times more likely to be hospitalized for asthma and there are 90 times more diesel particulates per square mile than in any other place in California.<sup>7,8</sup> Recently, a collaboration of local constituencies helped to close an industrial yeast plant, which had been the largest fixed source of air pollution in the area.<sup>7,8</sup> Approaches that foster cross-sector collaboration leverage resources more effectively, conserving money and improving outcomes.

Advocating for a healthy environment begins with a personal commitment to reconnect with the environment. A health provider committed to the local environment can serve as a powerful leader. The green health professional values personal health but also extends his or her health stewardship to community and environmental health. We must develop a new concept of ecology—one that includes personal ecology such as what we put in our bodies and what we eat, and one that includes environmental ecology such as how we care for the world in which we live. The combined ecological integration is vitally important for improving both personal and environmental health.

"My hope is that physicians, as they become more environmentally aware, will realize that they can help a lot more people by addressing environmental issues that influence their patients," says Calista Hunter, MD, an internist in Lafayette, California, and board member at the Teleosis Institute. Dr Hunter lives her vision of ecological medicine by teaching about the health benefits of the environment and the principles of green medicine at local hospitals throughout the Bay Area. Her commitment to a healthy future includes both personal well being and a passion for the outdoors.

### Practicing Sustainable Medicine

Promoting the benefits offered by a healthy environment is also good for personal health. Published studies, for example, continue to reflect the value of nature as a therapeutic tool. One recent study found that an outdoor, after-school program was as

### Interested in Green Healthcare?

Green healthcare is the focal point of the Green Health Care Online ([www.teleosis.org](http://www.teleosis.org)), a course that offers health professionals an opportunity to work with the essential concepts discussed in this article plus participate in a learning community committed to a healthy future. Through the development of leadership capacities and ecological literacy, physicians and allied health professionals can recommit to a brighter future for medicine and to living a professional life that is in integrity balance with the natural world.

effective for managing attention deficit hyperactivity disorder as pharmaceutical interventions.<sup>9</sup> Another study found that hospital recovery times were shortened for patients with a window and a view of a tree.<sup>10</sup>

Medicine that incorporates sustainability as a value will implicitly emphasize prevention of disease, which is a benefit to both humans and the environment. Research from Stanford University suggests that diet and lifestyle changes are very cost effective, slowing the onset of morbidity, saving healthcare dollars, and benefiting overall patient quality of life.<sup>11</sup> Medicinal sustainability puts many complementary therapies first in line because of their cost-effectiveness and value in saving resources. Conventional, resource-intensive approaches such as surgery and long-term pharmacotherapy would be withheld until patients failed to respond to more-sustainable treatment choices. Complementary therapies are fundamentally less costly because they do not rely on high-tech equipment. Large hospitals and up-to-date equipment have not proven to be more effective in benefiting overall health—a result that ends up plaguing medical economists in their attempts to curb rising medical costs. Americans spend 16% of the gross domestic product on healthcare; however, many measures of personal health, including life expectancy, infant mortality rank, low birth weight rate, deaths from child injury, and child maltreatment, present a poor picture of the true health of people in the United States. In these and other indicators, U.S. citizens rank near the bottom compared with other industrial countries<sup>1</sup> (on average, in the bottom 10th to 15th percentile<sup>12</sup>).

The beauty of CAM is that many therapies are not dependent on resource consumption. All forms of manipulative therapy, psychotherapy, and movement therapy require little if any intensive input of resources or equipment. In addition, CAM therapies often call upon the inherent healing potential of the patient; some depend upon medicaments found growing naturally, such as locally grown herbs. Several traditional forms of medicine, such as shamanism, operate completely outside the realm of technology, fostering in their followers spiritual, psychological, cultural, and environmental benefits. These systems often explore the role of nature in healing.

Practicing sustainable medicine requires a thorough understanding of the environmental consequences of modern healthcare. Fresh water, for example, is increasingly contaminated with pharmaceutical medicines due to ubiquitous pharmaceutical use

by large populations of people. The footprint of the pharmaceutical industry has not been examined carefully; however, it certainly utilizes vast quantities of resources. Typically, 100 kg of raw materials are consumed for every 1 kg of active pharmaceutical ingredient produced. This 1% material efficiency is extremely low compared with the norm for the manufacturing industry, which is 50%.<sup>13</sup> In 2005, the average pharmaceutical company used 22 million cubic meters of fresh water.<sup>14</sup> In 2005, GlaxoSmithKline disposed of 68 million kg of hazardous waste (excluding demolition and construction waste); 44% of this was incinerated with energy recovery, and 54% was incinerated without energy recovery.<sup>13</sup> (For more information on the pharmaceutical footprint, see *IMCJ* 6.4: 50-52, "Greener Pharmacy: Proper Medicine Disposal Protects the Environment.")

As a business sector, healthcare unfortunately continues to lack leadership in effective resource management. If we are ever to create a viable, sustainable future, I suggest it will require just such healthcare leadership. Choosing to allocate resources more with an intention to conserve human, economic, and environmental capital is the most effective method for shifting to a sustainable economy. Zero waste—the target of many programs—begins with a first step, ie, initial goals of a 10-20% waste reduction.

CAM therapies, as well as nutrition, lifestyle, and exercise, all offer physicians the opportunity to participate in promoting environmental health while also promoting individual well-being. The insurance industry will find greater value in reimbursing costs of health clubs, meditation, and yoga, as they prove to be cost effective, beneficial to health, and provided in a sustainable manner. Reserving more extreme interventions for situations in which they are truly necessary also will allow our healthcare system to better distribute resources to those truly in need. A more refined medicine will emerge when conservation is factored into the distribution of services.

Medicine that is cleaner, less polluting, more renewable, safer, and more accessible to people is essential to the needs of our growing population. An added benefit is that sustainable healthcare can more easily be distributed to disadvantaged communities due to its cost effectiveness. Thus, sustainable medicine is good for people and the environment, offering a new set of ethical values and principles for our crippled medical system.

**The Green Healthcare Model**

What this all leads up to is the green healthcare model—which encompasses the body and psyche of the patient, the physician–patient relationship, the physician’s health, the type of medical treatments used, the physician’s office or hospital, and the natural environment. Because all of these elements contribute to health and healing (see Figure 7), this unique model provides a framework for effective intervention on many levels, including care for the whole person, our communities, and our environment.

Green healthcare starts when the health professional takes steps to work in an environment that supports his or her own health as well as that of patients and local communities. Practicing medicine in a sustainable way begins with a focus on prevention and wellness. Considering the environmental conse-

**Figure 7.** Green Healthcare Within the 4-Quadrant Framework  
Green healthcare is focused on health of patients, doctors, communities, and the environment (including interior-invisible and exterior-visible factors)

	Subjective-interior	Objective-exterior
Individual-singular	<p><b>I</b> Experience <i>My purpose</i> <i>My vision as a doctor</i> <i>My experience of illness as a patient.</i></p>	<p><b>IT</b> Behavior <i>The medical care offered by the physician in consideration of the whole patient, including healing and disease</i></p>
Collective-plural	<p><b>WE</b> Culture <i>The relationship between the doctor and the patient; our medical beliefs, our public health cultures, and our ethical commitment to caring for the ill and the needy</i></p>	<p><b>ITS</b> System <i>The medical system, the pharmaceutical industry, the medical insurance industry, the public health system, and the environment in which we live</i></p>

quences of medical treatments takes more commitment, but can easily be initiated through simple office programs such as safe medicine disposal program like a Medication Take-Back Program. (For more information on safe medicine disposal, again, see *IMCJ* 6.4: 50-52.) Health providers of the 21<sup>st</sup> century must also take an interest in environmental issues and in advocating for environmental health, best done by connecting with local civic and environmental leaders.

The first step for all of us, however, is to reconnect and recommit to the passion that first brought us to healing, and to connect that impulse to the joy we take in a healthy, clean, natural world. From this sense of joy and inspiration, medical professionals can truly heal more broadly and deeply, and, as well, find the strength to lead our communities to a brighter future for our children and grandchildren. We must live in such a way that helps others live well too.

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