

Virtual Mentor

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MEDICINE AND SOCIETY

Medicine's Role in Mitigating the Effects of Climate Change

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Although philosophies connecting our health to nature go back to Hippocratic times, these early ideas stressed that harmony with and imitation of nature promoted health. Only recently have we begun to appreciate the reverse—that human medicine, as a result of its manufacturing processes, buildings, and waste disposal, has an unhealthy impact on the natural world [1].

The greening of health care has joined our general efforts to reduce the environmental impact of our homes, industries, campuses, transportation, and so on. Greening health care is challenging. Relative to homes, offices, and campuses, hospitals and clinics use materials and energy intensively—serving vulnerable patients and families in acute settings when those involved are too immersed in the crisis to embrace long-term environmental goals.

The first wave of health care greening arose in the 1980s with attention to such practices as cleaner manufacturing methods and reduction in waste volume, toxicity of medical materials, and packaging. This movement is led by Health Care Without Harm (HCWH), which holds an annual CleanMed conference featuring green products. HCWH and others have tackled incinerator emissions, mercury in the waste stream, plastic materials that leach out environmental estrogens, disposal of electronics, and toxic hospital cleansers, among other targets.

The second major wave has been driven by the movement to reduce the environmental footprint of buildings. The U.S. Green Building Council developed standards known as the LEED criteria to assess and rank the sustainability of all buildings, including those that house health care services. Boulder Community Foothills Hospital was the first U.S. hospital to be LEED certified. Many have been built since, and dozens are on the drawing boards.

Climate Change

A hospital is a high-energy enterprise—with its bright lights, refined air filtration, stable temperatures (intensive heating and air conditioning), heavy-duty imaging devices (with highly complex manufacturing histories), exotic chemicals, endless reusables and disposables, and the need to keep everything clean, disinfected, and purified. As continuing global exploitation of fossil fuels warms the Earth to an extent that bodes global natural and health disasters, health care is beginning to experience increasing pressure to reduce its use of energy—its carbon footprint.

Whether we are able to mitigate climate change or not, the environmental and monetary costs of fossil fuels are likely to increase in the coming decades, and, since health care uses large amounts of energy, it is likely to face significant cost increases. Recycling itself is energy-intensive in health care where high reprocessing standards must be met. These factors combine to challenge health care's ability to sustain its level of operation without steep increases in its monetary and environmental costs.

Moreover, climate change is beginning to cause unpredictable health emergencies, such as heat waves, floods, storms, droughts, food shortages, and the spread of mosquito-related diseases, among others [2, 3]. The demand for basic care will increase, and it will become more difficult to maintain the environment—electric and water supply and rapid transportation, for example—needed for sophisticated medical procedures. Recall the terrifying fate of advanced medicine during Katrina in New Orleans, when caring for patients demanded considerable heroism of physicians and other staff [4].

Current excitement in medical education and research is stimulated mainly by innovations in intricate medical technologies, robots, genetic advances, and nanotechnology, with little thought toward their potential environmental consequences. At the same time, the greatest need tends not to be in this area, but in the areas of basic treatment of injuries, long-term debility, mass public misery, and basic adaptation to climate change [5]. Sophisticated medicine's high-level requirements for materials and energy are playing a modest part, both philosophically and materially, in undermining the Earth's capacity to supply the primary environmental necessities for population health—clean air, water, and soil [6]. Meanwhile, migration, poorer food supply, international conflicts over water and other scarce resources, and too many guns and armaments are likely to create regional disasters that will require heavy use of emergency medical services [7, 8].

The Right Approach

Medicine can play a part in mitigating the intensity of climate change, principally by reducing the scale of health care. At greater than 15 percent of GDP, the expense of U.S. health care, much more than that of other developed nations, indicates its disparately large environmental footprint [9, 10].

U.S. fossil-fuel consumption must be reduced by roughly 80 percent in the next few decades if we are to avoid the worst health emergencies of climate change [11, 12]. This can't be done without reducing national end-use consumption. And since health care's fossil-fuel consumption is disproportionately large, it must cut back even more [13]. Downwardly adjusting the scale of health care relative to the overall economy is itself a challenge, and further reduction is daunting. A 10 percent reduction in a medical center's budget is generally regarded as an emergency; how can we achieve an 80 percent discount, even over 50 years, especially while we have such good ideas for new and even more expensive technologies?

A likely source of some physicians' general dismissal of the global-warming news is the over-optimistic belief that technological changes external to health care will solve everything. This is naive. Although growing, solar and wind together comprise a tiny segment of the energy economy; it will take decades to scale up, and the fossil-fuel economy is still dominant, with billions of people dependent on it. If global intergenerational health is the goal, the main objective of medical research ought to be, though it is not, to reduce the environmental impact of human biology and health and, in particular, to mitigate climate change while maintaining a healthy population.

Regrettably, many medical educators don't think climate change is real. This is partly due to a healthy habit of skepticism so necessary in clinical practice. The clinical model of evidence—where the human body is the system, with diagnosis and prognosis doubtful and patient testimony and behavior essential—is likely to make physicians view climate change as just another clinical uncertainty. Compared to human illness, climate change is well studied, and evidence for it is overwhelming [14].

How are we to scale down health care if so many in the medical community don't understand that the capacity of the global environment to sustain human and global ecosystem health is headed for a nosedive?

Medical Responsibilities

Although one might argue that physicians have a responsibility to educate patients on how to live healthily at a reduced environmental impact, few physicians have been educated on this subject themselves. Moreover, physicians are already burdened with huge expectations for patient education, while their opportunities for communication dwindle under the time pressure of increasingly complex medical technologies.

Rather than focusing on patient education, a better direction for physicians is working with institutional designers and administrators to lower the overall energy consumption of clinical workplaces. Physicians can work with supply chain managers to select tools and materials that are both medically effective and environmentally leaner. They can work with facilities managers and hospital architects to design modestly scaled medical buildings that are well lit and ventilated at low energy consumption levels. And physicians can emphasize reductions in carbon footprint when determining the suite of medical services to be offered by hospitals and clinics.

Conclusion

Old but good advice has a way of returning in new clothing. The often repeated anthem that health care costs need to be reduced and public health efforts amplified is revisiting us with renewed emphasis, now underlined by the terrifying potential public health disasters of climate change. To avoid these, we will have to change the energetics and thus the culture and consumption patterns, of society, or the climate will change our world for us well beyond our control [15]. As part of reenvisioning society, health care must also be reworked organizationally, philosophically, and

technologically to a depth that boggles and staggers our nearer good-hearted and practical aspirations.

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