

Ten rules for 21st century healthcare: a US perspective on creating healthy, healing environments

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ABSTRACT

As healthcare leaders look to the future, they are becoming increasingly aware of the vitally important connection between the quality of care delivered and the physical environments in which that care takes place. In addition, they are beginning to recognise the powerful connection between health care organisations and the environment, the very planet itself. These 10 new rules can provide a template to accelerate improved health, health care, and lower costs. They can serve as guideposts to designing truly healing environments today and tomorrow. The worlds of health care, architecture, the arts and the environment are coming together in new and profoundly powerful ways. Let's have the courage, creativity, and compassion to embrace this new world together.

KEYWORDS: Health, health care, architecture, art, environment

Introduction

Today, healthcare organisations are facing a torrent of pressures – cost, quality, uneven access to care, epidemics of chronic disease and infectious disease outbreaks. Health care leaders and policy makers are redefining the role and responsibility of health care providers beyond health care delivery to overall population health.

In so doing, they are becoming increasingly aware of the vitally important connection between the quality of health care delivered and the physical environments in which that care takes place.¹ In addition, they are beginning to recognise the powerful connection between health care organisations and the environment, the very planet itself.

To face this future, health care providers and leaders must understand and build on the connection between health care delivery, the buildings that support it, and the health of individuals, communities and the planet. The global healthcare industry is in a pivotal position to lead the 21st century integration of social, economic, environmental, health and resource-balanced practices in service of restoration and

Box 1. Ten new rules for healthcare.

- > Rule 10. Better buildings cost more initially, but cost less over time.
- > Rule 9. Become bi-lingual; understand theoretical and actual savings.
- > Rule 8. Move from silos to synergies: transform from a single aim to triple aim.
- > Rule 7. Commit to radical transparency.
- > Rule 6. Anticipate disruptive innovations.
- > Rule 5. Create an environment of care that people really, really want.
- > Rule 4. It's about health, not health care.
- > Rule 3. Link environmental sustainability to quality improvement.
- > Rule 2. Become an early adopter.
- > Rule 1. Reinvent healthcare through restorative and regenerative design.

healing. These 10 new rules for healthcare (set out in Box 1 and expanded on in this article) can provide a template to accelerate improved health and healthcare, and lower costs.

Rule 10. Better buildings cost more initially, but cost less over time

The evidence is in. Building better hospitals does improve care to patients and families while improving the work environment for staff.² The impact of the arts on health is also well established.³ But do better built hospitals cost more or less? No one knew. So in 2004, a multidisciplinary group set out to answer that question, putting all the components of proven design innovations together to create a mythical 300-bed Fable Hospital. While it had not yet been built in its entirety, all the components of it had been, and actual cost/benefit data existed. The Fable Hospital analysis showed that better buildings cost more initially to build. But it also showed that by helping to reduce infections, falls, medication errors, length of stay, and workforce injuries, they actually save money over time. Lessons from Fable: a one-time incremental construction cost of \$12 million on a \$240 million hospital (5%) would be recovered through reduced operating costs within 2 to 3 years.⁴

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When Peace Health replaced their flagship hospital in Eugene, Oregon, they fully embraced the design innovations described in Fable. Their post-occupancy research revealed these benefits: reduced length of stay despite increased patient acuity, reduced cost per adjusted discharge of 5.4%, dramatic increases in patient satisfaction, and significantly increased efficiency in the use of their operating rooms.⁵

In 2011, the authors updated the analysis, using new evidence-based design innovations and construction cost estimates to describe Fable 2.0.⁶ The business case was even stronger. This is hardly surprising, since the cost of harm to patients and staff has grown and will continue to do so. The message is clear: better health care environments (above the minimum requirements) cost slightly more to build (one-time capital costs) but save significant operating costs year after year – a compelling return on investment.

Rule 9. Become bilingual; understand theoretical and actual savings

Despite the analysis of Fable that serves as a catalyst to cross the capital cost/operating cost chasm, there are still barriers to overcome. One is continuing skepticism over the strength of the evidence, which is likely to diminish as more evidence is published and more innovators describe their experiences. But, it is also necessary for healthcare/design professionals, financial professionals and facilities professionals to understand each other's perspectives and find a common language. We need to become bilingual.

Light green and dark green dollars is a concept developed by the Institute for Healthcare Improvement (IHI).⁷ Savings from safety/quality improvements may theoretically exist – fewer infections and patient falls *do* cost less, but if hospitals and physicians are still paid for the additional care required or if there is no reduction in labor costs from harm avoided, there are no real savings for the hospital. Instead, the savings are realised by the overall health system. These are 'light green' dollars.

But if these theoretical savings can be converted into actual reductions in an identifiable hospital cost centre, such as labour or workman's compensation, there are real measurable savings to both the hospital *and* the system. These then become 'dark green' dollars. The emerging reality is that hospitals and physicians will no longer be paid for the costs of harm they cause.

In addition, efforts by hospitals to become more environmentally sustainable can save considerable operating costs over time. A recent US study, using actual data from 15 participating hospitals, demonstrated that the aggregate savings from modest reductions in energy use, medical waste, and more efficient use of surgical equipment and supplies would be in excess of \$5 billion in 5 years and \$15 billion over 10 years if applied over the entire US health care system.⁸

Health care clinicians, financial officers, architects, facilities and environmental experts must communicate regularly and often to understand how better environments actually improve care and reduce costs.

Rule 8: Move from silos to synergies: transform from a single aim to triple aim

Over the past 10 years, health care leaders have begun to move from the single aim of improved health care

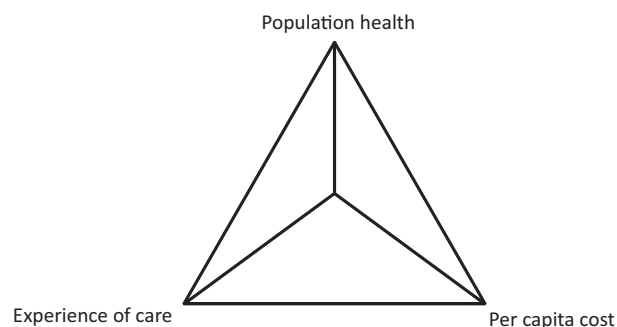


Fig 1. The Triple Aim, as developed by the Institute for Healthcare Improvement.⁹

delivery to individual patients to the IHI Triple Aim, which includes improved experience of care (including quality and satisfaction), better population health and lower per-capita costs (see Fig 1).⁹ In the US, pilot payment systems are beginning to reward healthcare systems under the Affordable Care Act to adopt the Triple Aim. In the UK, the decision has been made to consolidate health care funding and social services funding to achieve new synergies.

In his keynote speech at the annual CleanMed conference in 2012, Don Berwick concluded: 'Environmental sustainability doesn't just relate to the Triple Aim, it redefines the Triple Aim.' When hospitals commit to serving healthy food, they reduce waste, improve population health, and lower costs. Gundersen Health System's community partnership investments in local, renewable energy sources reduce the health impacts of fossil fuel emissions (population health), reduce costs of care, and improve the local economy. Seattle Children's Hospital rewards employees to carpool, use public transit, bicycle and walk—an initiative that improves engagement (quality of care), air quality and physical activity (population health) and lowers costs (fewer garages and parking lots).

Rule 7: Commit to radical transparency

Radical transparency describes actions and approaches that radically increase openness, communication and accountability. Global business has entered an era of transparency, fuelled by the 'information age' in ways that have resonance for healthcare. A 2010 Harvard Business Review cover story reported that corporate leaders are increasingly 'taking ownership' of the impacts that are directly traceable to their core business, such as fossil fuel emissions; 'taking action' on those impacts they contribute to and have some problem-solving competence to deal with, such as industrial food systems; and 'taking interest' in the ripple effects of their business, such as social justice issues associated with supply chains or waste streams.¹⁰

But in order to take responsibility, an organisation has to understand and quantify its externalities – open access to information is at the core of 'transparency'. The UK NHS is the first major system to quantify and openly report its carbon emissions in England, accompanied by a commitment to reduce those impacts by 80% by 2050.¹¹ This information not only

guides their direct impact investments, but also impacts their supply chain decisions, illustrating the three ways in which healthcare can use transparency to leverage improvements:

- **upstream leverage**, where the system influences its suppliers, such as advocating for antibiotic-free meats or responsible pharmaceutical production
- **downstream influence**, where the system influences its customers, such as serving healthier food or demonstrating greener cleaning chemical use
- **responsible production**, where the system considers efficiency of service delivery, such as locating facilities near public transportation, or reduction of medical waste.¹²

Rule 6: Anticipate disruptive innovations

Disruptive innovation, as applied to healthcare, describes lower cost service delivery innovations that undercut established markets. Disruptive innovations are particularly threatening to the leaders of an existing market, because they are competition coming from an unexpected direction.

Economist Clayton Christensen maintains that healthcare, particularly hospitals, require disruption because they remain highly centralized and expensive, and their acute care focus is increasingly irrelevant to large numbers of consumers.¹³ He argues that hospitals need to segment themselves, locating complex diagnosis processes in ‘solution shops,’ separate from effective, efficient, distinct ‘value adding process’ clinics (VAPs) that can deliver the specific high-volume procedures or care that people need once diagnosed. Disruptive innovations are happening at increasing rates: from the growth in medical tourism to VAPs specialising in orthopedics, oral surgery and cosmetics that deliver quality high volume care at lower costs.

Free-standing urgent care centres, ambulatory surgery centres, and primary care in retail settings are further examples of this trend. Kaiser Permanente found that two doctors working out of a micro-clinic could meet 80% of a typical patient’s needs.¹⁴ It’s the Pareto principle, also known as the 80/20 rule: 20% of the features or investment often delivers 80% of the value to consumers.¹⁵ In 2012, NHS Forth Valley Hospital became the first in Scotland to include robots in their new hospital building design to revolutionise their food service and pharmacy, improving quality and dramatically reducing operating costs.

Rule 5: Create an environment of care that people really, really want

In his IHI Annual National Forum keynote in 2009, Don Berwick asked people to consider not just what they wanted from healthcare but what they really, really wanted. He stated: ‘*Healthcare is not an end: it is a means.* In and of itself, it has no value whatsoever.’ Creating environments that people *really, really want* will be the key to winning or losing in the marketplace. This applies equally to the care we receive in our hospitals and to the people who provide that care.

Healthcare patients want more than competent care or engaging experiences – they want to be transformed from illness to health – a *transformative* experience.¹⁶ What is an ideal hospital or healthcare experience? Environments that cause no needless harm, anxiety, confusion, noise and sleep

deprivation, or lack of privacy are ones patients really, really want.

Business consultant Lance Secretan said it well in a keynote at EnvironDesign 9 in 2005: ‘There’s not an actual nursing shortage. There’s a shortage of places that nurses want to work.’ Acute care nursing is in crisis – the average age of a US hospital nurse is 47.0 years and continues to rise. Annual voluntary nursing turnover is 16.5%.¹⁷ If hospitals want to save money, reducing turnover is a key objective. Positive work environments with ample daylight, connection to nature, access to healthy food, healthy materials and improved indoor air quality are a good start. Environments that provide appropriate ergonomics and maximise convenience, choice and control are ones that staff really, really want.

Rule 4: It’s about health, not healthcare

Today, healthcare delivery is not particularly focused on health. Instead, it is largely a ‘sick care system’, focused on curing advanced stages of disease that, as Christensen maintains above, is irrelevant to the *health* needs of most people. It has been obsessed with ‘hospital care’ – creating ever larger and more specialised ‘towers of disease’. This 20th century system creates waste, dismal work environments, and a load of externalised environmental and health impacts. It’s a system that contributes to the problems it’s there to solve, dumping pharmaceuticals in our wastewater, disposable products in our landfills and oceans, and greenhouse gases in our atmosphere.

When health is the aim, ‘sick care’ is no longer sufficient. Jeff Thompson, MD, CEO of Gundersen Health System, Wisconsin, understands this: ‘Our mission is to improve the health of the communities we serve, and we cannot accomplish this mission without looking at our organisation’s environmental impact and how it contributes to disease.’ In a bold move, Gundersen has become the first carbon-neutral health system in the US, harvesting methane from agricultural waste and local landfills to both reduce their reliance on fossil fuels and the burden of waste in their communities.¹⁸

When healthcare organisations focus on health, they prioritise prevention, health management, and population health services (the Triple Aim). They move upstream, engaging in improving the living and working conditions of the communities they serve, with the goals of reducing chronic disease burden and associated costs. Finally, healthcare organisations use their position as trust holders of health to advocate for policy measures that reduce environmental and health impacts from other industries.

Ultimately, healthcare should anchor community health and resilience. Gary Cohen, founder and president of the non-profit organization Health Care without Harm, said: ‘A hospital can situate itself in the ecology of its community and act as a force for healing.’¹⁹

Rule 3: Link environmental sustainability to quality improvement

When health is the aim, externalised harm is no longer acceptable. As healthcare connects healing the earth and healing people, it demonstrates that there won’t be healthy people on a sick planet. In fact, the health of individuals cannot be separated from their immediate community and global

Fig 2. The Spaulding Rehabilitation Hospital, Boston, is the first waterfront building to be designed to withstand 50 year projections for sea level rise and storm surge. All infrastructure is located on the roof; the building is energy efficient and generates electricity through on-site combined heat and power (CHP). It features operable windows throughout to minimise overheating should mechanical systems fail. Photograph by Steinkamp Photography, reproduced courtesy of Perkins+Will.



contexts. When the healthcare industry connects its practices to their negative environmental and health consequences, it moves rapidly to change practice: the elimination of mercury-containing devices and the reduction in medical waste incineration are two examples.

Environmental sustainability must become a key tenet of quality improvement. Using a systems perspective, sustainable practices must permeate every aspect of care delivery in order to create a cascading series of health benefits, rather than externalised harm. It can no longer be viewed as a set of voluntary practice enhancements; the industry must harness health and sustainable thinking to fundamentally transform care delivery.

On a sustainable practices journey, many healthcare organisations begin with low cost operational improvements, such as rethinking disposables and waste volumes, healthy food procurement, and environmentally preferable purchasing. Others use a major building programme to advance sustainable practices, fundamentally reducing resource use and greenhouse gas emissions.

The *Lancet* and University College London, UK proclaimed climate change ‘the biggest global health threat of the 21st century’ – both the impacts of extreme weather and the population health stressors associated with changing patterns of agriculture, drought and water, and resource extraction.²⁰ In order to face this uncertain future, healthcare infrastructure must be both more resilient and sustainable. The challenge is to remain operational during and following extreme weather events, both to handle the emergency health needs of individuals and to provide essential services to an impacted community in the immediate aftermath of an event. Without the ability to do both, healthcare delivery quality is compromised.

In the US, the president’s 2013 Climate Action Plan calls for hospitals to become ‘more sustainable and resilient.’²¹ Around the globe, there are new tools and resources

emerging aimed at improving the resilience of healthcare infrastructure. The US Department of Health and Human Services is developing a healthcare infrastructure resilience guide and toolkit. The global campaign for Hospitals Safe from Disasters, sponsored by the World Health Organization, has produced a series of tools and resources, including the SMART Hospitals Toolkit developed by the Pan American Health Organization. Fig 2 shows the Spaulding Rehabilitation Hospital, Boston, which is the first waterfront building to be designed to withstand 50 year projections for sea level rise and storm surge.

Rule 2: Become an early adopter

To be fully engaged in creating innovation, you have to become an early adopter – to take some risks. Around the world, healthcare organisations are shifting practice to embrace environmental and human health and community in new and exciting ways.

In the US, thirteen major systems have sponsored the Healthier Hospitals Initiative (www.healthierhospitals.org); 1,200 hospital members are focusing on one or more of six challenges: engaged leadership, healthier food, less waste, safer chemicals, leaner energy and smarter purchasing. More than 10,000 hospitals worldwide have joined the Global Green and Healthy Hospitals network (www.greenhospitals.net), which asks that healthcare organisations adopt two or more of ten goal areas. Together, these initiatives define a robust learning community from which early adopters can both learn and lead.

Early adopters all have one thing in common – they do their homework, learn the evidence and then innovate. They take risks and deliver. In so doing they make their own hospitals better and, through sharing their lessons learned – both successes and disappointments — create a new path forward (and standard of care) for global healthcare.

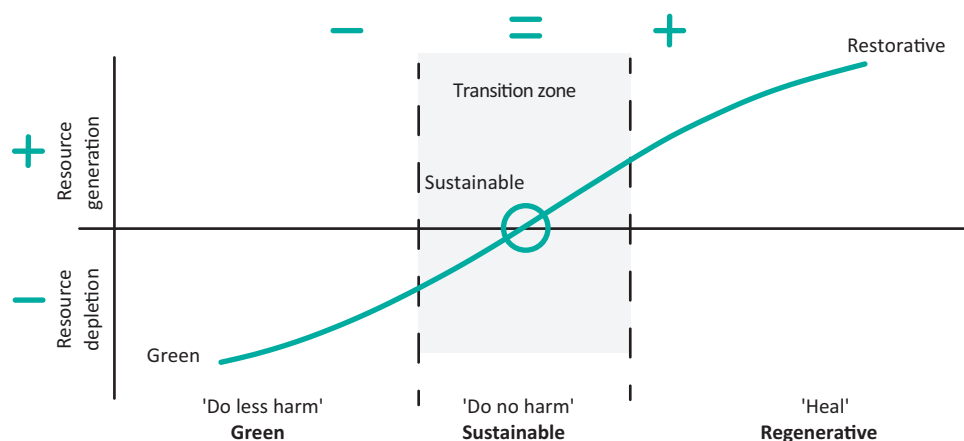


Fig 3. Green practices reduce the negative impacts on health and the environment. Sustainable practices 'do no harm' while restorative practices 'heal' the harm that has already been done. Restorative practices create cascading series of benefits instead of externalised harm.

Rule 1: Reinvent healthcare through restorative and regenerative design

It is time to take a major leap from doing the best that we already know and cross a chasm to new worlds that are just beginning to unfold. Today, healthcare operates in an arena of 'doing less harm' – focused on reducing negative environmental and health impacts on staff and patients, our communities, and the planet. The emerging movement toward restorative and regenerative design is about moving beyond these 'so-called solutions' that degrade health – to solutions that 'do no harm' and 'heal' some of the harm that has already been done (Fig 3). It's about finding solutions that stop making us sick.

The NHS England sustainable development strategy is leading this transformation, describing its 'vision for a sustainable health system' in its 2011 *Route map for sustainable health*:²²

Imagine a time when going to the hospital is seen as a failing of the health and social care system... Imagine a place where the few buildings that support the health system are in tune with the environment. They use almost no carbon and are integrated into the community and with nature... Imagine knowing that we have done our best to improve health and minimise our impact on the environment...

It's about repositioning healthcare as the custodian of planetary health. It's about moving beyond the four walls of the hospital, into our communities, boardrooms, and halls of government to position health as the aim. This transformation is possible. Capturing this vision will be difficult, but it *is* the work ahead. Here and around the world, there are amazing healing initiatives appearing, and buildings that connect with people and their communities in profound and enlivening ways. When healthcare connects with health, everything changes!

Conclusion

The worlds of healthcare, architecture, the arts and the environment are coming together in new and profoundly powerful ways. The light of awareness has been turned on. The tipping point has been reached. The capital cost – operating costs chasm is about to be crossed. Healthcare and health will be significantly enhanced at lower costs in better designed physical environments and in communities that incorporate evidence-based design. Fable Hospitals are being built.

Environments that people really, really want are emerging. They no longer degrade health and wellbeing: they are environments that help create joy in work – places that represent a new way of thinking about the role of health and healthcare in our communities and lives. Leaving behind the metaphor of 'hospital as machines for healing', these are places designed by human beings for enhancing the health of human beings.

These 10 rules can serve as guideposts to designing truly healing hospitals today and tomorrow. Sociologist and scholar WEB DuBois said it well: 'Now is the accepted time, not tomorrow, not some more convenient season. It is today that our best work can be done and not some future day or future year.' Let's have the courage, creativity, and compassion to embrace this new world together. ■

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