Sustainable Initiatives to Guide Healthcare Transformation (SIGHT):

Recommendations on Sustainable Healthcare in New Jersey

Executive Summary

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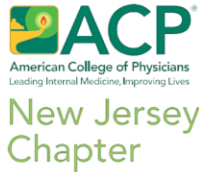Kyle Tafuri, Hackensack Meridian Health

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The statistics are staggering. The global health care industry is responsible for 8.5% of worldwide net greenhouse gas emissions — the equivalent of 514 coal-fired power plants. If the global health care sector were a country, it would be the world's fifth-largest emitter of greenhouse gases, on par with the entire United Kingdom.

Those are some of the eye-popping numbers from Health Care Without Harm (HCWH), an international organization working to make health care ecologically sustainable. The numbers are particularly disturbing for the United States: The United States is the world's highest emitter of health care greenhouse gases, accounting for 27% of the global health care footprint (China, at number two, accounts for 17%).

At ACP, we see the need to address sustainability in our own backyards as climate change is a significant driver of health and of the social determinants of health. Many institutions have already launched environmental initiatives, from energy conservation to green lab programs. In December 2018, seven Boston-area teaching hospitals and clinical institutes, including Harvard Medical School, announced a [commitment to decarbonize](). The University of California system has pledged to become 100% reliant on clean electricity for its campuses and medical centers by 2025, and the Cleveland Clinic is working to become carbon neutral by 2027. Numerous hospitals have received LEED certifications ([a program developed by the U.S. Green Building Council to rate environmentally friendly buildings]()), from the Columbia University Medical Center in New York City, New York, to the Shands Cancer Hospital at the University of Florida in Gainesville, Florida. The [Kaiser Permanente]() health system is the first in the country to reach carbon neutrality, by taking sequential steps on the road to sustainability. They improved energy use efficiency 8% since 2013, saving $19.6 million annually, and decreased water use intensity 15.3%, saving $2.8 million annually. Their hospitals, medical buildings, and offices no longer have a carbon footprint, which is equivalent to taking 175,000 cars off the road. These are just a handful of examples of how health systems are meeting the changing world. (For other examples, please refer to Appendix B in the SIGHT document).

Our series of recommendations are meant to guide health systems to more sustainable futures through the implementation of cost-effective and forward-thinking strategies. Below are some specific examples of initiatives at other health systems which should serve as a beacon and a warning to New Jersey. We must begin a change to sustainability and healthcare resiliency now for the benefit of our patients and our health systems. We want to lead the way as a state. Not be left behind.
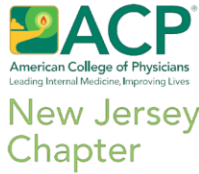
These recommendations are broken out into the following main categories:
- **Leadership:** To drive sustainable changes throughout health systems, there must be buy-in by senior leadership and integration of sustainability in every decision made in a healthcare network. Sustainable health-care systems must be developed that provide health care for patients today without compromising health and care provision in the future. Utilizing all three elements of the triple bottom line (environmental, social, and financial), leadership can support and guide initiatives that minimize waste and expense and lean methodology can be applied to all decisions, incorporating environmental and population outcomes as additional metrics. When leadership gets on board with the notion that sustainability is connected to public health, employee satisfaction, quality care, and other outcomes, there is greater opportunity for successful integration into decision-making and day-to-day operations.
- **Financing:** Many environmentally responsible changes to health systems are also fiscally responsible. Health systems can prioritize sustainability activities and can easily address the "low hanging fruit." However, for larger, higher yield projects that require initial capital investment, return on investment models can be helpful to inform decisions. Alternative funding sources may also be an option. The

American Council for an Energy Efficient Economy estimates that for a hospital operating on a 2% Net Operating Income, $1 saved is equivalent to $50 in gross revenue. This amounts to significant capital that can be invested back into the organization. Similar work done by the University of Washington Target 100! shows that $800,000 in annual energy cost savings can be equal to $16 million in revenue generating services.

- **Supply chain:** Emissions from the supply chain (scope 3 emissions) constitute 80% of a healthcare systems overall greenhouse gas emissions. Purchasing power can be exerted to minimize waste and optimize the carbon footprint. Purchasing power can move to greener alternatives to products and minimize unnecessary devices and packaging.

- **Waste:** Hospitals and health systems produce large amounts of waste, estimated at almost 30 pounds per patient per day in the hospital. This is costly to the institution which must pay for disposal and has obvious environmental costs. Everything hospitals procure should be evaluated for its end of life disposition. Steps can be taken to reduce both volume and toxicity of materials and wastes.

- **Water use reduction:** Water quality and availability are both essential to protecting patient and worker health and critical to daily hospital operations. The World Economic Forum's 2016 Global Risk Report states, "... the failure of climate change mitigation and adaptation has risen to the top and is perceived in 2016 as the most impactful risk for the years to come, ahead of weapons of mass destruction, ranking second, and water crises, ranking third." Health care facilities are often not only the largest consumer of water in a community, but also can potentially be inadvertent water polluters through poor control of pharmaceutical and hazardous materials. Reducing overall water use can reduce the amount of pollution a facility generates and it can also save money.

- **Operating room:** The OR has the largest footprint of any department in a hospital, and also yields significant savings opportunities. Understanding where to begin requires understanding what practices are currently in place. The OR can generate 30% of a facility's regulated medical waste and can represent 40-60% of a facility's supply costs. Operating rooms consume three to six times more energy per square foot than any other department. Reviewing OR kits to remove items frequently unused yields up-front purchasing savings, as well as avoided waste savings. The OR generates 30% of a facility's RMW. Using reprocessed single use medical devices diverts RMW and yields cost savings for facilities. Starting first with non-invasive devices can help ease potential concerns around quality or safety. Anesthetic gases are Scope 1 greenhouse gases, vented directly from the hospital into the atmosphere. Anesthesia providers have an opportunity to directly impact their organization's GHG emissions by considering anesthetic gas use while still providing quality patient care. With challenging recycling markets, especially from acute care areas, waste prevention is a priority for leading organizations. Switching to reusables, single-use device reprocessing and manufacturer take-back programs are strategies to make less waste altogether.

- **Energy:** Health systems are extremely resource-intense entities creating opportunities to move to sustainable energy and for cost-saving initiatives. A hospital that is energy efficient will save the organization money and help make the surrounding community healthier by reducing carbon emissions. In the U.S., eliminating fossil fuel pollution can save 100,000 lives and $880 billion annually. Electricity produced from renewable energy sources, like wind and solar, are the least expensive source of energy in more than half of the world and are on track to be the least expensive source almost everywhere by 2030.

- **Education:** All initiatives should be bolstered by educational efforts. When patients and employees are informed, they can make healthier choices for themselves and their environment. Effective education can model and change the culture of an institution as well

- **Agriculture:** Sourcing food locally encourages economic growth. Offering whole foods promotes healthier lifestyles and preventative practices. Hospitals have significant buying power as they are often one of the community's largest consumers. By purchasing local and regional food, hospitals amplify their healing mission by addressing some root causes of health risks, increasing employee and patient health and satisfaction, and bolstering regional economies to create community resiliency. By purchasing food and beverages that have earned trusted third-party certifications for quality and sustainable practices, hospitals can shift the entire food system toward sustainability, without significant cost increases to total food service spending. By using purchasing power to move away from detrimental food production practices like the overuse of antibiotics in animal agriculture to transform the food supply chain in order to better protect human and environmental health. Diets that embrace plant-based proteins are trending for both health and environmental reasons. One in four consumers are eating less meat and roughly half of younger consumers and one-third of older people already regularly choose plant-based foods instead of meat.

- **Chemicals:** Many substances employed in health systems can have unintended negative impacts on people and the environment. Polyvinyl chloride (PVC) and di(2-ethylhexyl) phthalate (DEHP) are chemicals that have a negative impact on our environment and human health. The Food and Drug Administration has recommended hospitals limit exposures to DEHP for sensitive populations, especially male neonates and infants. Mercury is toxic to human health, posing a particular threat to the development of the child. Some traditional cleaning products contain ingredients that have been linked to occupational asthma. It is possible for hospitals to maintain optimal infection prevention and control while also reducing staff, patient, and visitor exposure to harmful chemicals present in many traditional hospital cleaners. Antimicrobial ingredients, like triclosan and triclocarban – which are used widely in health care for hand hygiene – have also been shown to pose health risks to long-term users. Evidence shows that many of the chemicals used in these products off-gas, or migrate out, from the finished product and get into the air and dust, exposing employees, patients, and visitors to the chemicals. Health systems can promote less toxic chemical usage and manage disposal effectively.

- **Construction:** The new construction built today can be expected to be our healthcare setting for the next 50 years. Buildings in NJ must thus be constructed with an eye to the future in terms of resilience as well as energy efficiency. The [Leadership in Energy and Environmental Design (LEED)](#) building system is the most widely recognized certification system for green buildings. Unfortunately, of NJ's 2270 LEED-certified buildings, only 3 hold full healthcare certification. The average age of a US hospital calculated in Hospital Plant Years has continued to increase with a concomitant decrease in Value Based Purchasing (VBP) Total Performance Scores, including clinical care and patient experience.

- **Transportation:** Transportation is the largest contributor to carbon pollution in NJ which directly causes poor air quality (ozone and particulate matter 2.5) and impacts to climate change. Mobile fuel combustion is the top source of U.S. greenhouse gas emissions. On average, 76% of the U.S. workforce drives alone to work. Emissions from transportation contribute to air pollution, a known public health threat. Increased fuel efficiency reduces distribution costs and environmental emissions. For every hour it idles, an ambulance burns 1.5 gallons of fuel, emits 33 pounds of carbon dioxide, and wears down the engine the equivalent of traveling 35 to 50 miles.

- **Infrastructure resiliency:** Health system resilience is the ability to maintain optimal system performance in times of adversity/crises. However, achieving resilience requires constant balancing

of alignment, collaboration, adaptation and transformation of supply, demand, and contextual factors within and outside of the system. Extreme weather events and climate change have taxed the ability to deliver care in times of crisis as has the COVID-19 pandemic which too has roots in climate pressures and the increasing proximity of humans to animals usually kept separate. Shocks to the healthcare infrastructure can be large and complex, such as infectious diseases, natural disasters, and refugee influx, or can be slower onset, such as shifting demographics, droughts, urbanization, and migration. Any expected or unexpected shock will further deteriorate the health system's existing performance. The fragility of a health system also results from supply- and demand-side factors. The supply factors include weak management of or poor planning for availability of medicines or supplies, or poor distribution of human and financial resources to match population health needs. Demand factors imply that people perceive the utility of services and trust them to change their health-seeking behaviors. Health system resilience should be fostered by paying continuous attention to supply, demand, and contextual factors and their interdependencies and linkages.