

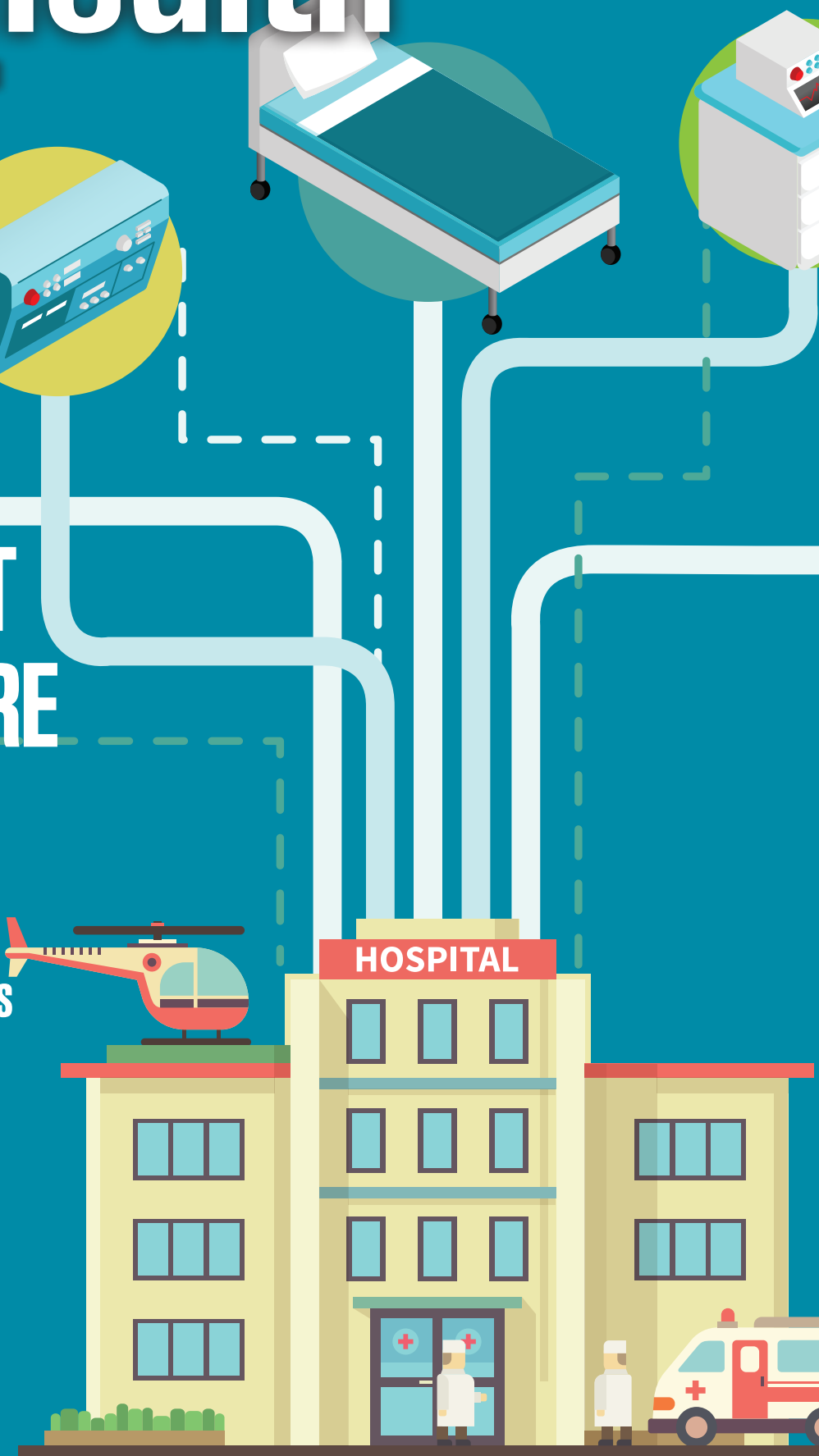
Greenhealth

A Practice Greenhealth Member Publication

THE TRUE COST OF HEALTH CARE

One major city's climate
change strategy

Health Care Without Harm's
20th Anniversary



Look Beyond the Price Tag

New tool helps purchasers evaluate the
TOTAL COST OF OWNERSHIP of health care products

Greenhealth Cost of Ownership Calculator

Many medical devices cost more than the purchase price when considering usage, maintenance and disposal costs. Evaluating these hidden costs before purchasing will help hospitals save money and reduce environmental impacts.

The GCO Calculator helps hospitals compare products evaluate impacts and save

Practice Greenhealth and our partners have developed the the Greenhealth Cost of Ownership (GCO) Calculator that brings these hidden costs to the surface. Using a standardized framework, the tool helps purchasers assess and compare costs, and make cost-saving decisions.

Specifically, the tool will help:

- Find cost savings while providing quality health care
- Minimize the environmental footprint of health care
- Improve the health of patients, staff and communities served

Visit PracticeGreenhealth.org/GCO or email Beth Eckl
at beckl@PracticeGreenhealth.org to learn more.

Thanks to the GCO Calculator Sponsors for making this project possible and to the hospitals, health systems and Group Purchasing Organizations who provided valuable expertise and input.



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Is it really green?

WHAT WE BUY MATTERS—
TO OUR HEALTH, OUR
ENVIRONMENT AND
OUR COMMUNITIES.



How do you know what's actually in a product? What attributes make it green?

We know.

LEARN MORE: GreenhealthExchange.com



Greenhealth

Greenhealth is published quarterly by Practice Greenhealth, the nation's leading membership and networking organization for institutions in the health care community that have made a commitment to sustainable, environmentally friendly practices. Members include hospitals, health care systems, businesses, NGOs and other stakeholders engaged in the greening of health care to improve the health of patients, staff and the environment. Subscriptions are free to Practice Greenhealth members. All others are \$95 annually. Practice Greenhealth, 12355 Sunrise Valley Drive, Suite 680, Reston, VA 20191 ©2016 Practice Greenhealth. All rights reserved.

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20 Years in, We're Just Getting Started



When we started Health Care Without Harm (HCWH) 20 years ago, we hardly knew anyone who worked in the health care sector. We were mostly outsiders—community activists who had been working for decades in the environmental movement. But we knew we needed powerful allies to transform the emerging science linking the environment to our health into action that would protect our children, our families, our communities. We needed health care.

We have come a long way in the last 20 years. More than 4,500 waste incinerators in the U.S. have been shut down. Mercury thermometers and blood pressure devices have disappeared from hospitals, and we now have a global treaty to phase them out by the year 2020. Hospital leaders have begun to switch to safer plastics, greener cleaners and healthier building materials. Hundreds of hospitals are now sourcing local and sustainable food for their patients and employees. Thousands of hospitals around the world are working to reduce their climate footprint.

What began as a small group of environmental health advocates has grown into a global movement, and leaders within institutions have become champions for sustainable health care. Working closely with environmental service staff, architects, engineers, dietitians, nurses, doctors, procurement experts, financial officers and CEOs, HCWH is no longer an outsider to the health care sector, but a partner for change.

Over the past 20 years, we have grown our network to strengthen and empower this global movement of which we're all a part. HCWH now has regional offices in the United States, Asia, Europe and Latin America, with many more strategic partners throughout the world. Practice Greenhealth, our U.S. membership organization, has nearly 1,400 members—20 percent of U.S. hospitals—and has become the premier sustainability resource for the health care sector. Our Global Green and Healthy Hospitals Network now includes 500 members from 32 countries, representing the interests of more than 12,500 hospitals and health centers from every continent.

What is the next chapter of our journey together? We need to redefine the mission of health care in the 21st century to embrace a vision of community and planetary health. We need the health care sector to use all its assets—its clinical expertise, its workforce development, its purchasing power, its political clout, its moral authority—to create the conditions for healthy people and healthy communities right where we live and not just in the health care setting.

By building deep partnerships within our communities, we can ensure that basic human needs are met—healthy food, safer and more affordable housing, clean air and drinking water, renewable energy, fair-wage jobs and safe neighborhoods.

After 20 years, we have realized that it is not enough for health care to “do no harm.” Looking ahead, we’ll see a broader healing mission for health care. Health care will lead the rest of society in healing what has been damaged in our communities, in our food supply, in our environment and in our economy. This movement we’ve collectively built gives me hope for the future, and together, we will redefine health care in the 21st century. Twenty years in, we’re just getting started. 

Sincerely,

GARY COHEN

President and Founder
gcohen@hcwh.org



Will Vendors Meet the Call for Sustainable Meat and Poultry?

Nine major U.S. health systems, supported by a network of thousands of health care facilities across the United States, are calling on food producers and manufacturers to meet the growing demand for sustainable meat and poultry within health care.

Individually, the health systems—Advocate Health Care, Catholic Health Initiatives, Dartmouth Hitchcock Medical Center, Gundersen Health System, Hackensack UMC, Kaiser Permanente, Partners HealthCare*, University Hospitals Health System and Veterans Health Administration Nutrition and Food Services—have already achieved significant goals in sustainable food purchasing. Up to 60 percent of each system's meat and poultry purchases are now comprised of products raised without routine antibiotics.

Despite these efforts, U.S. hospitals' capacity to meet sustainable food purchasing goals remains out of reach until producers and the health care supply chain increase production and access to verified products.

"Health systems have been demanding these products for several years, and small- and mid-scale producers are ready to respond. We see an opportunity for health care to partner with their vendors, like food service management companies, food distributors and group purchasing organizations, to incorporate these producers and tip the scale around antibiotic overuse in animal agriculture. We want to see larger producers follow suit, so all hospitals and other institutions can access these products," said Hillary Bisnett,

national procurement director for Health Care Without Harm's Healthy Food in Health Care program. "Over time, these partnerships have the potential to also reshape the supply chain and take sustainable meat production to the next level."

These leading health systems are not only contributing to the collective demand for meat and poultry raised without routine antibiotics, but they are also transitioning toward socially and environmentally responsible meat production practices. Combined, they spend more than \$34 million per year on meat and poultry products and are backed by thousands of hospitals within the Health Care Without Harm and Practice Greenhealth networks that are actively working toward purchasing more sustainable products at their facilities.

Around 23,000 Americans die from antibiotic-resistant infections each year, and thousands more succumb to longer, riskier and more expensive hospital stays. Antibiotic resistance costs the United States billions of dollars annually in direct health care expenses and lost productivity. Antibiotics are an essential part of the health care we receive, yet 80 percent of those sold in the United States—the same medicines used to treat human infections—are used in industrial animal agriculture as a stopgap against crowded and unsanitary conditions.

Because the health care sector is such a large part of the economy, hospitals can help shift the entire marketplace, benefiting public health and

making products safer for all consumers. In 2015, Health Care Without Harm and Practice Greenhealth found that more than half of hospitals surveyed were purchasing meat and poultry products raised without routine antibiotic use and were spending an average of nearly 15 percent of their food budgets on local and sustainable foods. 🌱

**Participating Partners HealthCare hospitals include: Brigham and Women's Hospital, Brigham and Women's Faulkner Hospital, Cooley Dickinson Hospital, North Shore Medical Center-Salem, North Shore Medical Center-Union, Spaulding Rehabilitation Hospital-Boston and Spaulding Rehabilitation Hospital-Cape Cod.*

Where to Buy

Health Care Without Harm has been compiling a directory of sustainably raised meat and poultry products for health facilities to use when making purchasing decisions. Together with the facilities in their network, the organization expects to see this list grow in quantity and variety so hospitals will be able to supply their food service while working within their missions to promote public health. For the Meat and Poultry Product list, visit www.noharm-uscanada.org/content/us-canada/meat-and-poultry-product-list.



2016 Sustainability Benchmark Report Brings Data to Life

A new design for Practice Greenhealth's *2016 Environmental Excellence Awards Sustainability Benchmark Report* makes it even easier for hospitals to gauge and benchmark their progress.

Available only to Practice Greenhealth hospital members, the annual report summarizes the sustainability achievements of health systems that are setting the standard for health care environmental stewardship. This year's edition uses new, bold graphics such as pie charts, infographics and other ways of illustrating measurements and percentages.

The new approach is designed to allow hospitals to view, at a glance, progress by industry leaders that are successfully reducing their environmental footprint, achieving financial savings and changing the culture of their organizations as they address environmental issues and opportunities in areas as diverse as energy, waste management, safer chemicals, water management, healthy food, green buildings and climate impact.

"The extensive data in the *Benchmark Report* is being presented in a new way to inspire environmental accomplishments and substantial

financial savings and guide all hospitals to triple bottom-line success in their own operations by benchmarking their progress in different areas against other hospitals," said Gary Cohen, president and founder of Practice Greenhealth.

The *2016 Sustainability Benchmark Report* is available for download at www.PracticeGreenhealth.org. 

A Strategy for C-Suite Ownership

Strategic deployment consulting from Practice Greenhealth empowers hospital sustainability from the top down.

BY JANET HOWARD, DIRECTOR OF MEMBER ENGAGEMENT AND HEALTHIER HOSPITALS, PRACTICE GREENHEALTH

“Practice Greenhealth is a strategic partner, and its formal consultation offer of strategic deployment helped Providence Health Services bring together key stakeholders for a powerful foundation to strengthen our goals and prepare for our system journey with a goal of being the healthiest health care system in the sector.”

—RICHARD BEAM,
CHIEF ENVIRONMENTAL OFFICER

MORE SUSTAINABLE IN A DAY

To learn more about Practice Greenhealth’s strategic deployment consulting and to schedule a daylong event for your hospital, contact Janet Howard at jhoward@practicegreenhealth.org.



Iqbal Mian, Practice Greenhealth member engagement manager, brings his Lean Six Sigma and quality training to the forefront as the leader of the daylong strategic deployment event.

NO MATTER what industry you’re in, we know this to be true: “It all starts with leadership.”

All too often, Practice Greenhealth hospitals have the passion. They have departmental successes. But they struggle with top-down support. To be fair, due to continual changes in the health care sector, leadership priorities have grown exponentially. And deselection often isn’t an option, which makes it difficult to balance patient care and daily operations with sustainability initiatives.

However, when you don’t have a sustainability strategy that’s aligned with organizational direction, it often leads to projects that get kicked off without connecting to overarching goals. The results are pockets of success, lost opportunities and falling short of bigger opportunities. Our members have made it clear: Additional leadership engagement and support are a must in order to bring programming to the next level. Enter strategic deployment consulting.

Strategic Deployment Consulting: What Is It?

New for 2016, Practice Greenhealth has kicked off its strategic deployment consulting offering to bring hospital leadership and other key stakeholders together. With the support of Practice Greenhealth experts, together we can reflect on the state of your hospital culture, current initiatives and future plans before developing vision statements, setting goals and crafting elevator speeches that focus on sustainability. The daylong strategic deployment event is facilitated by two Practice Greenhealth member engagement team members under the leadership of Iqbal Mian, member engagement manager, who has formal training in lean principles and strategic deployment, and experience in hosting more than 40 environmental process improvement events.

“The beauty of strategic deployment is how it allows visual alignment of key goals

and initiatives by the people advancing this meaningful work—and how it anchors that work to your hospital mission,” said Mian. “Thus, leaders are empowered to get serious about executing sustainability across their organization and culture, which ultimately touch the patient and the community they live in. We are absolutely thrilled to help health care organizations become systemically focused in their sustainability journey with this service.”

The aha moments are rewarding, as they challenge capacity and barriers, organizational values and patient connections to ensure

“The beauty of strategic deployment is how it allows visual alignment of key goals and initiatives by the people advancing this meaningful work—and how it anchors that work to your hospital mission. Thus, leaders are empowered to get serious about executing sustainability across their organization and culture, which ultimately touch the patient and the community they live in. We are absolutely thrilled to help health care organizations become systemically focused in their sustainability journey with this service.”

—IQBAL MIAN, MEMBER ENGAGEMENT MANAGER, PRACTICE GREENHEALTH

proper alignment with future deployment. This management approach has been proven to help leaders gain a clear understanding of the cascading effects when frontline employees are able to engage and deploy initiatives with clear ties to mission and vision. Throughout the event, we emphasize the organizational value of *people* in the triple bottom line, which is defined as people (your hospital staff, patients and community), planet (how your sustainability efforts affect the environment) and profits (economic impact).

Interactive sessions guide the leadership team through a shared process of identifying sustainability goals in strategic areas for the organization. The visioning and goal-setting process is complemented by Practice Greenhealth facilitators, who share median and 90 percent targets for each of the identified sustainability areas based on real-time sustainability performance metrics. Through the use of a standardized set of templates, stakeholders are also guided to identify the opportunities with

the biggest impact and lowest risk for both cost-saving and environmental improvement strategies. Meanwhile, team-building exercises using sustainability process improvement tools offer many teachable moments.

Throughout the day, the easygoing, interactive manner of the facilitators is designed to create a trusting, fun and creative atmosphere, where idea-sharing results in firm goals and schedules for team members to execute. A report at the end of the day recaps and summarizes key takeaways, and deliverables include mission language, a vision statement, goals, an elevator speech and a PowerPoint deck to facilitate communication to key stakeholders.

The most powerful deliverable of all, however, doesn't come on a piece of paper. The value of strategic deployment is in working together to craft powerful solutions, gain C-suite ownership, and ultimately, ingrain sustainability throughout your health care system, your community and beyond. 🌱



Janet Howard, director, member engagement, shares Practice Greenhealth's median and 90 percent data benchmarks, helping leadership consider their five-year environmental stewardship goals.

Just Breathe

**Here's how you
can make the case
for environmental
stewardship in
anesthesia care.**

BY KAELEIGH SHEEHAN, PRACTICE
GREENHEALTH MEMBER ENGAGEMENT
MANAGER, GREENING THE OR INITIATIVE



ANESTHESIA AND the use of anesthetic agents are not new to the health care sector. However, their direct impact on the environment, patients and community health is quickly becoming a major area of focus for the anesthesia provider and health care community due to their global warming potential.

The use of anesthesia and analgesia to improve patient safety and provide patient care is pervasive. Typically associated with inpatient and ambulatory surgical settings, anesthesia can be used in cardiac catheterization labs, gastrointestinal endoscopy, diagnostic imaging procedures, labor and delivery, pediatrics and other departments.

An estimate from the Sustainable Development Unit in the U.K. indicates that anesthesia is responsible for 5 percent of an acute care hospital's environmental footprint.¹ This is a conservative and imperfect estimate and only represents the percentage from acute-care inpatient hospitals, so it's likely that anesthesia's footprint is actually greater. Here in the United States, hospitals are directly responsible for 8 percent of greenhouse gas emissions.² In fact, anesthetic gases used for patient care (most commonly desflurane, sevoflurane and isoflurane) are greenhouse gases, as is nitrous oxide. In many health care settings, waste anesthetic gases—those gases that are exhaled or unused by the patient—are trapped from the immediate clinical setting through scavenging systems and vented

directly off the roof of the building into the local community and atmosphere. Sevoflurane, isoflurane and desflurane have high 20-year global warming potentials of 349, 1,401 and 3,714 respectively.³

While an essential clinical practice, anesthesia has financial implications for health care institutions as well. The anesthetics themselves are costly: Desflurane, the worst environmental offender, happens to be the most expensive. Health care organizations that have worked to educate their clinicians and reduce desflurane consumption have seen considerable cost savings. For example, Johns Hopkins Hospital provided education and saw costs for inhalational anesthetics go from \$12,500 to \$8,500 per OR annually, or a savings of more than \$226,000.

Beyond these environmental and financial implications, adverse health impacts from exposure to waste anesthetic gases are cause for concern, both for the health and safety of health care staff and their surrounding communities. Potential adverse health risks range from dizziness and nausea to sterility, miscarriage, birth defects, cancer, and liver and kidney disease.⁴

New Practices

A survey of more than 780 anesthesia providers from the U.K., Australia and New Zealand found that 95 percent of providers support increasing recycling and sustainability efforts in their clinical environments.⁵ A similar survey

was conducted in the United States with more than 2,000 responses, indicating that 91 percent of anesthesia providers surveyed are interested in recycling and sustainability programs.⁶ One common takeaway from both surveys is that despite interest, clinicians believe they lack adequate education around these practices.

It's clear that developing and providing education to anesthesia providers and key stakeholders is imperative. When presented with peer-reviewed research, clinicians are able to review their practices without adversely affecting patient care.

For example, the low-flow technique is a practice consideration for anesthesia providers that has both environmental and financial benefits. After induction and with careful patient monitoring, an anesthesia provider can lower the flows of anesthetic gases to an amount that's needed to maintain sedation while being more fully metabolized by the patient. This practice helps reduce excessive, unnecessary gas flow that would otherwise be unused by the patient and vented into the environment.

Waste Not

A number of waste streams are generated through the provision of anesthesia, but strategies are available to mitigate that waste. Opportunities include proper waste segregation at the anesthesia cart; recycling clinical plastic, including packaging material and empty containers; utilizing reusable laryngeal mask airways, endotracheal tubes and laryngoscope blades instead of disposable products; utilizing reprocessed single-use medical devices when possible; and proper pharmaceutical waste disposal.

Waste also occurs in the form of wasted anesthesia drugs. Ordering an excessive amount of emergency or on-hand drugs that have a limited window of use before needing to be disposed of leads to a waste of the supply. Also, these additional pharmaceuticals can enter and pollute waterways after disposal.

The "Price" of Purchasing

Purchasing opportunities include investing in reusables and reprocessed equipment and choosing materials that minimize DEHP and

PVC. Anesthesia machines can have lifespans of 15-plus years, so it is beneficial to choose more energy-efficient options and models that help clinicians track flow rates and practice low-flow techniques. Additionally, emerging technologies for waste anesthetic gas capture are making their way into the market. These capture systems go beyond the standard scavenging systems, capturing, separating and preventing the waste anesthetic gases from exiting the hospital.

Using purchasing data to track the volume of anesthetic gases has been the first step for Practice Greenhealth to establish a usage benchmark for the United States, with a goal of developing metrics and a reduction challenge.

Energy Use

There are also opportunities for energy savings directly related to anesthesia care. Besides choosing more energy-efficient equipment, savings are also reported from the use of waste anesthetic capture systems that reduce the energy consumed from the waste energy disposal system and extend the life of the medical vacuum pump.⁷

Global Impacts

The international community of anesthesia providers has shown mounting interest in the environmental footprint of anesthesia. In the United States, the American Society of Anesthesiologists has organized the Green Initiatives Task Force to support and lead its members, has established a liaison between its committee and Practice Greenhealth, and has developed numerous resources for anesthesia providers.⁸ Part of NHS England and Public Health England, the Sustainable Development Unit has developed a report on the greenhouse gas footprint of anesthetics and developed a carbon footprint calculator.⁹ Doctors for the Environment Australia has developed a position statement and collected some research on anesthetics and the environment.¹⁰ In August at the World Congress of Anesthesiologists in Hong Kong, the presentation "Going green while maintaining quality of care in the operating room" was delivered to more than 9,000 delegates in attendance.¹¹

Future Directions

It's a common belief across the anesthesia community that appropriate education for clinicians to safely provide more environmentally friendly anesthesia care is lacking, despite the existence of considerable literature. This is one barrier that sustainability managers can overcome. Many position statements¹²⁻¹⁷ from varied clinical groups support environmental stewardship, and the impressive amount of advocacy and education that has already occurred points to a receptive and eagerly awaiting audience, with the trailblazers already off and running.

Education for key stakeholders is critical. Thirty-four percent of Practice Greenhealth award winners reported providing staff education on environmental impacts of inhaled anesthetics and reduction strategies for clinicians in 2015. Just as important is the delivery of this education. Because of its complex, clinical and direct patient impact, it is imperative that anesthesia providers and experts are leaders and advisors in this space. Anesthesia providers educating their peers will go much further than non-clinician-led efforts. Educating support staff and ensuring ready access to tools and resources is also a key component to spreading this work.

Beyond education, gaining a better understanding of best practices in tracking anesthesia usage to establish a more definitive greenhouse gas footprint for current practice is necessary in order to benchmark and track reduction efforts and impact. For example, only 49 percent of Practice Greenhealth award winners attempted to enter anesthetic gas purchasing data on the award application in 2015.

Still, momentum toward environmental stewardship in anesthesia care has been building and is reaching a critical tipping point. To date, an impressive wealth of research, education and advocacy has already occurred. The health care community needs only to take advantage of these opportunities to provide more sustainable anesthesia, with the potential for enormous impact across the United States and among international health care communities. ●

For the complete list of references used in this article, visit www.greenhealthmagazine.org/just-breathe.





BUYER

Aware

How much does a product truly cost? As the new Greenhealth Cost of Ownership Calculator demonstrates, environmentally preferable products may result in significant savings to a health system when considering costs beyond just the purchase price.

BY M. DIANE MCCORMICK

In health care, costs and sustainability are intertwined. Even as hospitals strive to lighten their budgets and their environmental footprints, on average, they spend 17 percent of their budgets on supplies, generate 5.9 million tons of waste annually, and gobble water and electricity.

The cost of purchasing environmentally preferable products on top of that can cause even the most forward-thinking hospital CEOs to balk. “But some purchases are going to cost you more in the long run, even though they may be cheaper to buy,” said Practice Greenhealth’s Environmental Purchasing Program Director, Beth Eckl, especially when you add in energy costs, waste disposal and other factors.

Those total costs can now be quantified through the Greenhealth Cost of Ownership (GCO) Calculator, developed by Practice Greenhealth in conjunction with top hospitals, suppliers and group purchasing organizations. Like deciding which car to buy based on mileage, maintenance and insurance costs, the tool calculates the total cost of using supplies and equipment over the course of their lives, from purchase to disposal, and can unveil sustainability benefits that were once unquantifiable.

“We knew there was inherent benefit sometimes in going green,” said Nestor Jarquin, surgical sourcing manager, Buy to Pay, Kaiser Permanente. “The tool dissuades the myth that going green costs money. It will tell you that in some instances, it may not cost you money when you take into account other factors, such as how much it costs you to throw the item away. Now, on the back end, we have a good idea of what the total cost is, which is something we haven’t seen in a standardized fashion.”

“We focus so much on our own little world—our own little hospital. We’re providing great care. And then we look at the equipment and chemicals we use, and it’s horrible for the globe. It’s great to have the commitment to do our best work, but we’re missing that vision of some of the downstream decisions we’re making. We need to think globally. We need to do no harm in our environment.”

—ANDREW MADDEN, DANA-FARBER CANCER INSTITUTE SENIOR DIRECTOR OF SUPPLY CHAIN

DUE DILIGENCE

Hospitals “are resource pigs,” said Dana-Farber Cancer Institute Senior Director of Supply Chain Andrew Madden.

Of course, he added, that’s the nature of a life-or-death business, but purchasing decisions shouldn’t be made solely on “the price at the pump.” The total cost of ownership perspective, from purchase to disposal, puts a mindful spin on the business of supplies.

“If we do our due diligence on the front end of the purchase, we will absolutely save some money somewhere down the stream, but you have to do the work upfront,” Madden said.

Madden was one of the partners who helped develop the GCO Calculator, which was about three years in the making. Practice Greenhealth initiated the process when it learned that for hospitals, cost was the biggest barrier to purchasing environmentally preferred products. In Phase One, a task force of industry professionals compiled the requirements for calculating total cost of ownership and sought—but couldn’t find—existing tools to accommodate that information.

In Phase Two, participants developed and beta-tested the calculator, adhering to demands for simplicity in health care’s downsizing climate. “There are always competing priorities and time constraints,” said Madden. “It’s hard to get to that level of detail, and manage that level of detail, without a simple tool. We’re always chasing information. I kept on saying that if it’s too difficult, if there are too many fields to populate, we will not use it. We just won’t have the time to do it.”

The development group brought the GCO Calculator to the point where usage “takes just a little bit of time,” he said, but delivers a huge end result, allowing buyers to evaluate purchases from a resource consumption perspective.

The calculator is a progression from a scorecard developed in the mid-2000s that assesses the sustainability of potential purchases by probing

details such as whether hardware is “virgin” or recycled, or what chemicals were used during production, said Jarquin. Now, the new calculator “can provide metrics and reports that validate assumptions we knew were there all along” regarding resource consumption.

In essence, he said, the calculator yields answers to common questions: “How green is green? Does it cost more? Does it cost less? What’s the total cost for a particular project?”

THE GCO CALCULATOR: A CLOSER LOOK

Built on an Excel-based spreadsheet, the GCO Calculator is downloadable and designed for repeated uses without the fear of hacking that comes with online offerings. It features:

- The ability to input data on direct costs, including purchase price, maintenance and use costs (such as energy, water, labor and cleaning), and end-of-use costs.
- A simple, initial screening assessment, helping users determine if they should continue.
- A training video, detailed instructions and FAQs.
- Pop-up advice on possible sources for the data sought for each field. (For costs that can’t be found, the calculator defaults to regional and national averages.)
- Entry of up to four product scenarios for comparison.
- Report capabilities on short-term and long-term costs, cumulative cost of ownership and other findings, all in bar charts and line graphs for at-a-glance comparisons by product.

Practice Greenhealth provides members with a companion template of utility costs to capture data that can be reused in multiple calculations, Eckl said. The current calculator is considered a 1.0 version—still subject to updates based on user reviews, but also thoroughly vetted by the steering committee participants before release.

The calculator is “pretty intuitive,” said Jarquin. “If you use it one time for a simplified project, you see the benefit.” Once the calculator validates opportunities to save costs, “that’s when you get the ear of supply chain and CFOs and COOs.”

“It’s easy,” said Madden. “You just plug and play.”

Madden tested the calculator on the purchase of a minus-80-degree freezer and learned that about 50 percent of the freezer’s lifetime cost wasn’t even reported using traditional purchase calculations. The calculator quantified costs such as electricity, HVAC for cooling the room and end-of-use disposal. In the final accounting, one freezer was shown to save about \$3,000 over its lifetime and use 40 to 60 percent less energy.

It was the marriage of cost savings and environmental benefits that tool developers were striving for. “This is a major cultural shift and a rethinking of how we manage our business on the supply chain side,” said Madden.

THE SUPPLIER EQUATION

The calculator is also another channel for suppliers to provide sustainability information sought by hospitals, said Ellen Kondracki, senior director, global sustainability for BD (Becton, Dickinson and Company). “It feeds the information in a way where the outcome to the end user is to look at that environmental attribute as part of a total system.”

Previous environmental purchasing initiatives have helped buyers craft specific questions for suppliers in order to elicit sustainability benefits and collect apples-to-apples comparisons among product choices, Kondracki said. The GCO Calculator can further advance how the environmental impact of product choices is evaluated. “Having a better understanding of environmental costs throughout the system

Start Saving Now

The Greenhealth Cost of Ownership Calculator is available through Practice Greenhealth’s Greening the Supply Chain Initiative, at www.PracticeGreenhealth.org/GCO.

in which products are used can help both buyers and suppliers,” she said. “It creates a new lens for evaluating sustainability in the purchase decision and could even advance communications, helping suppliers understand how customers value the information.”

In a coordinated sustainability strategy, vendors must be part of the patient care team, which requires collaboration on sustainability and cost savings, Madden said. When suppliers understand the hospital’s institutional goals, “they feed us, instead of us chasing the opportunity. That puts us in a much better situation, because now I can do more and add value to our end user—our customers,” he said. “We’ll have more time to talk about the strategy of it, rather than chasing the data to get to a point of understanding it.”

Jarquín expects to see some suppliers “welcoming the calculator and saying it’s about time.” Others will see with consistent use that they are collaborating in “the next level of engagement in sustainability of the product line.” For instance, the calculator could reveal a more cost-beneficial decontamination and sterilization process for reusable products, which could prompt suppliers “to consider validating the instrument to be processed in a different fashion.”

NEW OPPORTUNITIES

As the final step before launching in the third quarter of 2016, project sponsors asked for a repeatability and reproducibility assessment. “The purpose was to see if three users with the same input data would reach the same outcome with the calculator,” Eckl said. Jarquín has found in initial use that the calculator is “all-encompassing and standardized and repeatable.”

“As long as your input is solid, your back-end output is accurate as well,” he said.

Practice Greenhealth is holding webinars and training on using the calculator. As it takes hold, developers hope hospitals grasp its “human health and environmental impact” as well as its cost-saving benefits, said Eckl.

“The GCO Calculator can identify products that use less electricity, water and waste, which are three elements contributing to the degradation of the planet and to communities and public health, so it is all tied in together,” she said. “This calculator is therefore an opportunity to not only help you save money, but also to improve patient health and the health of the community and the planet.”

Madden agrees that everyone in health care, including those in finance and purchasing, should adhere to the physician’s oath to “do no harm.”

“We focus so much on our own little world—our own little hospital,” he said. “We’re providing great care. And then we look at the equipment and chemicals we use, and it’s horrible for the globe. It’s great to have the commitment to do our best work, but we’re missing that vision of some of the downstream decisions we’re making. We need to think globally. We need to do no harm in our environment.”

Plus, if hospitals can reduce resource costs, he added, “there’s more money to infuse in the patient side to go and buy that next amazing smart pump, CT scan [unit] or MRI.”

Increasingly, hospitals must juggle their own green goals with sustainability measures enforced through state and city mandates, Madden said. Because many of his departments finance equipment purchases from scarce research grants, he hopes to overcome their reluctance to buy more efficient but higher-priced equipment by reimbursing the difference to departments using grants with funds from areas where savings occurred—an idea borrowed from Harvard University that could, for instance, mean transferring money from the facilities budget to the department that bought the more sustainable minus-80-degree freezer.



Jarquín also sees “larger opportunities outside of the surgical field,” as the calculator is applied to other areas in health care, such as construction and environmental services. Like the environmental scorecard, as the GCO Calculator becomes integral to purchasing strategies, it could be reviewed and validated during every contracting cycle.

For suppliers and buyers, “there are a lot of different levers you pull to get after better sustainability in health care overall,” said Kondracki. The GCO Calculator is “one piece of the puzzle,” promoting partnerships that leverage each player’s sustainability goals.

“We can all make incremental changes, which are really good and really important, or we can look at how to make systemwide changes and really change how we think about how we do things,” she said. “I don’t think you can get to systemwide change like this unless you have organizations from all different parts of the supply chain talking and collaborating together. As a member of the TCO steering committee, that’s what this experience was. The level of change that could come from this is because of all the different parts of the supply chain that had a seat at the table.” ●

RESIL



CLIMATE

A major city vulnerable to climate change is modeling some of the nation's most innovative and ambitious climate and energy resilience plans.

BY KATHY FAY MAHDOUBI

As a major center of biomedical research, advanced medicine and academia, some might be concerned to learn Boston is also the fourth-most vulnerable city in the United States in terms of its susceptibility to the adverse impact of climate change, according to the World Bank. Climate change-driven sea level rise, storm surges, extreme precipitation and heat put into sharp relief the region's need to protect the community sustainably. In response, The Barr Foundation and former Mayor Tom Menino created the Boston Green Ribbon Commission, including 22 hospitals in a Health Care Working Group, to implement some of the nation's most innovative energy and climate resilience plans.

Three Cases In Point

Boston Medical Center (BMC), the area's acclaimed safety-net and research hospital, completely redesigned its existing campus and energy systems to improve patient care and resilience. Critical infrastructure elements were moved to higher floors in buildings. A new, islandable combined heat and power (CHP) plant also supports the city of Boston's nearby emergency telecommunications infrastructure in the event of power outages. BMC's greenhouse gas emissions will be reduced by more than 50 percent by 2018, saving \$8 million to \$11 million per year, averaged over 20 years. "Every dollar spent on energy is a dollar not spent on our mission," said Bob Biggio, the hospital's vice president of facilities and support services. "[These savings are] really helping us fulfill our mission."

Another of the city's most climate-resilient medical facilities is the brand-new Spaulding Rehabilitation Hospital—winner of a 2016 Greenhealth Emerald Award and named 2016 Energy Champion for the American Society of Healthcare Engineers. Spaulding can offer a strong aquatics-based

patient rehabilitation program because it is just 91 feet from Boston Harbor, which gives the program open water access. But with 2015 full-moon high tides cresting above parts of Boston's waterfront, a growing risk from storm surges and a predicted doubling of extreme heat days, the facility's design had to adapt.

Spaulding's ground floor was raised. Plantings, walkways and retaining walls in areas patients use for rehabilitation and respite act as a protective "reef." The thermal envelope was upgraded to increase passive resilience and eliminate perimeter heating and cooling. There are demand-controlled and keyed operable windows. A raised entrance prevents seawater from entering underground parking. All critical systems—with robust redundancy—are located above flood levels, including a large penthouse for mechanicals.

Supporting such efforts, Boston's innovative Green Ribbon Commission (GRC) is comprised of 34 big-name civic, institutional and business leaders, all of whom work to engage their sector peers and help execute the city's Climate Action Plan. Its goals are to lower greenhouse gas emissions while preparing for climate change's many infrastructure, health, economic and social impacts. GRC health care executives sponsor energy and climate work both in their institutions and sectorwide, and help other sectors appreciate the extent to which climate change impacts public health and health care costs. With coordination by Health Care Without Harm (HCWH), the GRC Health Care Working Group provides leadership, coordination and best practices, and tracks important climate and energy public policy.

For example, city officials and the GRC just completed Phase I of what is probably the most detailed urban climate-risk assessment in the United States, *climateready.boston.gov*, and are discussing options such as flood gates, industrial pumps for subway stations, neighborhood-scale microgrids, expansive water portability in the case of a water main break, and other systems to ensure that patients and health care workers can reach and do well in health care facilities, even during extreme disruptions.

LEVERAGING ACTION FOR HEALTH AND RESILIENCE

The Rockefeller Foundation defines energy resilience as "the capacity of an individual, community or institution to dynamically and effectively respond to shifting climate impact circumstances while continuing to function at an acceptable level." Renowned health care sustainability architect Robin Guenther describes resiliency as a balance between hardening systems to withstand acute shocks and managing chronic stressors such as poverty in the community.

Boston first armed itself against climate change in 2007, following the Climate Protection Agreement and Cities for Climate Protection campaign, with an executive order outlining how the city would go about reducing greenhouse gas emissions by 80 percent by 2050. Since then, new benchmarks have been set every few years. The nearest goal is a 25 percent reduction in greenhouse gas emissions by 2020. At least five major hospitals in Boston will meet or exceed that goal, estimates Bill Ravanese, senior director of the Health Care Green Building and Energy program for HCWH and co-coordinator of the Health Care Working Group for the GRC, inspiring a friendly competition between health care, higher education and commercial property owners.

BUILDING WITHOUT HARM: BY THE NUMBERS

Representation from the health care sector is crucial; it's the city's largest employer. Nationwide, health care produces as much as 9 percent of all commercial and industrial greenhouse gas emissions. In metro Boston, health care spends more than \$200 million per year on energy and is

responsible for half-million metric tons of carbon dioxide equivalent emissions annually, from the consumption of more than 7 trillion Btus per year in 22 million square feet of owned buildings. This is according to a recent analysis by the GRC Health Care Working Group and HCWH, which in 2011 began a collective effort to track sector energy and greenhouse gas performance, three years before Boston began requiring energy reporting.

One of the big challenges for Boston health care—renowned for its cutting-edge research—is reducing energy use in laboratories. "Labs are challenging energy hogs, with their high ventilation rates, many fume hoods, extensive freezer farms, equipment density, long hours of use and the fact there is virtually no ENERGY STAR lab equipment available," said Ravanese. "However, we've done a lot of work with the GRC's Higher Education Working Group, utilities and hospitals to spread best practices in lab energy efficiency."

The good news is that sector energy efficiency efforts thus far have reduced greenhouse gas emissions equal to an average passenger vehicle driving 85 million miles. Absolute energy use decreased by 6 percent from 2011 to 2013, and source energy use intensity decreased by 4 percent. These are major accomplishments, considering that demand for energy has increased about 1.5 percent per year in health care historically.

"The challenge for health care facilities is that factors like the aging population and clinical progress are outside their control," said Paul Lipke, senior advisor of Energy and Buildings for HCWH and co-coordinator of the GRC Health Care Working Group. "You can do great energy efficiency work, but at the same time, your hospital might treat more and sicker patients, add two MRIs, three operating theaters, and thousands of new computers and electronic medical devices that increase your load. If you've already done a lot of energy efficiency, it can be a huge accomplishment just to hold energy use flat."

BIG-TICKET ITEMS FOR CLEANER MEDICINE

Virtually all of the major hospitals in Boston, including Beth Israel Deaconess Medical Center, Boston Children's Hospital, Dana-Farber Cancer Institute, Tufts Medical Center and Massachusetts General Hospital, either already benefit from or are developing highly efficient CHP systems, many with the ability to keep the facility operating for long periods if/when the grid goes down. CHPs also reduce greenhouse gases and major pollutants, and largely eliminate the significant energy losses that occur between a facility and its energy suppliers.

In addition, climate change and 2008's spike in energy costs prompted many hospitals to put serious money and time into strategic energy master plans, advancing both energy efficiency and renewable energy purchases. Because Partners Healthcare's energy costs that year were \$20 million above business as usual, "we invested in a Systems Engineering Management Plan (SEMP) with the specific goal of finding out how to meet [climate and greenhouse gas] targets, and also isolate ourselves from fluctuations in the cost of energy," said John Messervy, corporate director of design and construction.

In implementing its SEMP, Brigham and Women's Hospital has achieved a 36 percent reduction in greenhouse gas emissions since 2009. On the supply side, "over 60 percent of the power that Partners purchases is now green power—a combination of wind, solar, biogas and low-impact hydro power," said Messervy. "We're hoping to have about 20 percent of our total energy consumption being generated by off-site wind, and then our plan is to continue to increase the renewable energy fraction as opportunities present themselves."



Spaulding Rehab Hospital, Charlestown. Perkins + Will. Photo by James Steinkamp

Climate resiliency is built into the design of Spaulding Rehabilitation Hospital.

Similarly, the GRC is accelerating renewable energy generation and purchases, especially by big energy users. In June 2016, the GRC sent a large, diverse team to Europe to study leading practices in resilience, especially offshore wind power generation. With Barr Foundation support, the GRC also offered a \$100,000 prize (plus technical support) for the institution or institutional collaboration that purchased at least 10 megawatts of renewable energy, with criteria such as physical proximity, replicability and retirement of renewable energy credits. The prize stimulated tremendous activity by many GRC members, and as a result, renewable energy deals totalling about 70 megawatts by health care, commercial and other nonprofit organizations will be signed by late 2016.

Also, in August 2016, Massachusetts Gov. Charlie Baker signed legislation that would make the state a leading source of wind power by requiring solicitation of 15- to 20-year contracts for 1,600 MW of deepwater wind power south of Martha's Vineyard, and an additional 1,200 MW from other hydro, wind or solar sources. "If we continue to be aggressive, Massachusetts could become an energy exporter within a decade," said Ravanese.

ONE STEP AT A TIME

These and other steps taken by Boston hospitals with the help of the GRC and HCWH are significant when viewed as an indicator of an industrywide

shift toward sustainable practices. Still, very difficult work lies ahead. What will be needed in 35 years may be hard to discern, but several things must happen before Boston and Massachusetts can meet their shared 80 percent reduction by the 2050 target, suggested Ravanese.

First, the state will need to pass recently introduced legislation that allows for a revenue-neutral carbon fee. Second, renewable energy purchasing and generation will have to be adopted by all major energy users. While the 1,600 MW of offshore wind and 1,200 MW of other renewables to be developed are encouraging, they are not enough. "Over the coming decades, the Commonwealth would need to scale deepwater wind, solar, etc. to achieve much higher output," said Ravanese.

Other opportunities include deeper energy efficiency in homes and businesses, grid modernization and more aggressive demand-response energy initiatives to shift customer energy usage to off-peak times. The state recently raised its solar net metering cap, which puts a ceiling on hookups and incentives for renewable energy generators, but Ravanese wonders if outright removal of the cap may be needed to reach the state's long-term goals. He also spoke plainly about the eventual need for society to largely give up fossil fuels. It may take several decades, but with the help of forward-thinking policies, organizations like the GRC, and the dedication to energy resilience seen from Boston health care and other large institutions, anything is possible. ●

WHAT WE EAT: FOOD'S ROLE IN RESILIENCY

The broader definition of resilience is the community's ability to respond to any threat. That includes the impacts of climate change, but also influences such as gentrification and downward harmonization, which push vulnerable populations and smaller businesses out of the community.

"We are activating hospitals' role as anchors in the community to not only become energy-efficient, but also restorative in their practices," said Stacia Clinton, director of HCWH's Healthy Food in Health Care program. "It's very important when we are talking about climate preparedness that it is not just focused on energy resilience, but also the many ways people are susceptible, including their housing and access to food and safe water."

Restorative practices in institutional food procurement programs look at using purchasing dollars wisely by investing at least a percentage of funds into foods that are grown within the community or region. These also involve supporting not only local farms, but also local cooperatives, processing centers and agricultural programs to promote economic growth and development in the community.

A recent meta-analysis of 56 studies investigating the effects of industrial farms on the socioeconomic health and welfare of smaller

communities found that, across the board, industrial farming led to several unfortunate outcomes, such as significant income inequality, reduced property values, higher levels of unemployment, and reduced community services and civic engagement. New food procurement campaigns such as Healthy Food in Health Care aim to bring a greater balance between large, midsize and small-scale farms and downstream processors and distributors in order to bolster the community and nourish patient populations at the same time.

"We are building a regional food system that is now less reliant on national suppliers that have to get in and out of the state because we are growing the food locally," said Clinton.

These campaigns are gaining momentum, but the quantitative impact of local procurement has not yet been fully assessed. Metrics for improvement include job growth, local workman ownership and upticks in sales to suppliers. Such diversified food access is essential to any resiliency plan, not just for the ongoing well-being of a community, but also because a major storm or unforeseen drought could have a devastating effect on local and national food supplies. Smart purchasing by hospitals can also go a long way toward influencing food suppliers to limit food waste and contribute to climate health by reducing chemical inputs such as nitrogen fertilizers and being discerning about how food is transported. —K.F.M.

Every Last Drop

Health care food purchasing can avert a water (and climate) crisis.

BY APRIL GALARZA,
COMMUNICATIONS COORDINATOR,
HEALTH CARE WITHOUT HARM,
HEALTHY FOOD IN HEALTH CARE PROGRAM

HOSPITALS ARE on the front lines of the water crisis. These facilities account for 7 percent of the commercial and institutional water use in the United States, using an average of 49 gallons of water per square foot—a vast improvement from the nearly 70 gallons per square foot that was normal a decade ago.

Hospitals are taking solid steps to reduce their water footprints, such as installing low-flow fixtures and avoiding the use of potable water for landscape irrigation.¹ However, there is another significant way the health sector can help prevent water scarcity and resultant food insecurity—one it may already be engaged in—and that's through hospital food purchasing.

Climate Change, Water and Agriculture

According to Ted Schettler, MD, MPH, science director of the Science & Environmental Health Network and science advisor for Health Care Without Harm (HCWH), the agricultural system in the United States is based on assumptions of cheap energy, climate stability and plentiful water. However, as temperatures rise, rain patterns change and water scarcity affects more and more people, it is becoming increasingly evident that these assumptions are no longer valid, especially when it comes to water availability.

Worldwide, two-thirds of the population—around four billion people—are experiencing severe water shortages² during at least one month every year. According to the World Health Organization, 1.6 million deaths each year³ can be attributed to diseases associated with lack of access to safe drinking water, inadequate sanitation and poor hygiene.

In addition to these direct health impacts, water scarcity often results in food scarcity. Only 3 percent of the world's water is fresh water, but 70 percent of it is used in agriculture.⁴ Water scarcity has the potential to double the effect of climate change on crops⁵ and threatens farmers' ability to produce the food needed to nourish communities. In Haiti, where a three-year drought has been exacerbated by El Niño and rising temperatures, the number of people who

are food insecure has doubled,⁶ and millions are at risk of starvation because without water, they cannot grow food.

"Climate stability and plentiful water are no longer assumptions that we can hold onto. We're seeing the consequences of the changes, and the impacts on agriculture are profound," said Schettler.

Climate change and associated rising temperatures are causing the zones where food is grown to travel north or south (depending on the hemisphere). It is causing changes to precipitation patterns so seasonal rains can no longer be relied on, and in some areas of the world, there are lengthy, seemingly unending "100-year" droughts.

Here in the United States, our food system is dependent upon domestic and global food marketplaces, and clearly, both are threatened. For example, California—where a sizable majority of the nation's fresh fruit and vegetables is grown⁷—is experiencing its fifth year of unprecedented drought, affecting the availability and price of produce nationwide. And according to the U.S. Government Accountability Office, 40 out of 50 states are expected to face some kind of water shortage⁸ in the next decade.

Groundwater, the underground bank of water that farmers have relied upon for hundreds of years, is quickly being depleted, far faster than is possible to regenerate. The Ogallala Aquifer, the immense 174,000-square-mile freshwater basin that enabled the development of America's breadbasket, is being rapidly consumed.⁹ Approximately one-fifth of all U.S. cattle, corn, cotton and wheat depend on the water from this aquifer alone. However, around 30 percent of the water within it has been pumped, and an additional 39 percent is expected to be depleted in the next 50 years. Replenishing it would take a millennium.

The Water We Eat: More Meat, More Water

On average, it takes more than 15,000 liters of water to produce one kilogram of beef in the industrial production system, using grains, hay and silage for animal food.¹⁰ To put that into perspective, most people drink about two liters per day. There is an invisible water footprint for

all food products that is comprised of the water used to produce the food. This includes the water used to grow the food (in the case of animal agriculture, water is used to grow fodder and hydrate livestock), along with the water used to produce the fuel needed to transport it.

The average water footprint per calorie for beef is 20 times larger than for cereals and starchy root vegetables. Diets rich in plants, alternative proteins and smaller portions of meat, as recommended by health professionals for proven health benefits, contribute to mitigating water scarcity and climate instability due to their smaller water and carbon footprints.

With growing water scarcity, increasing demands in many countries and the impact of climate change on water supply, Schettler and many other experts recommend that limited water supplies be used more judiciously.

A key example offered by Schettler is a re-evaluation of water-intensive beef and dairy production taking place in the water-scarce Central Valley of California. “California is now the number-one dairy-producing state in the country, and many of the dairy operations are huge megadairies that are planted in the Central Valley of California, where there is very limited water and the groundwater is being rapidly depleted. Feed and water need to be brought to the animals in those confined operations to produce milk,” he said. “There are numerous opportunities for water savings, including growing more diversified crops that are less water-intensive and pasturing the cattle where rain is sufficient to support a largely grass-based system.”¹¹ It is time to re-evaluate where best to grow and raise food in relation to available resources.”

Already, some California ranchers and dairy producers are sending their operations out-of-state to locations with more plentiful water.

Ripple Effects

Addressing water scarcity through hospital food purchasing improves the food and water supply, and helps mitigate climate change.

“There are [many] opportunities to redesign food systems,” said Schettler. “One of the ways to do that is to get grazing animals back on

grassland. When you do this, there are several effects: The animals are taken off most—or even all—corn and soy, and other food grown with large inputs of fossil fuels and chemicals. If you put animals back on grass and into integrated cropping systems where possible, you reduce the need for the grain inputs, and if done with proper grazing techniques, you actually improve the capacity of the grass-covered soil to hold carbon and water. So, with proper animal agriculture, you can help solve the problems that the industrial model of production has created.”

Health care facilities can support this effort through their purchasing. Water is one more reason—and a significant one—to use HCWH’s “Less Meat, Better Meat”¹² strategy.

“Helping hospitals see the connection to climate change and the opportunities for using agriculture to help sequester carbon in soil and reduce greenhouse gas emissions is something that we really want to stress in the coming months and years,” said Schettler. “It is important to recognize that agriculture can be part of the solution and doesn’t have to be a major contributor to the problem.”

Schettler recommends that hospitals continue to change their purchasing practices in ways that support healthier agricultural systems. “This constitutes a public health intervention that we should applaud and support,” he said. “I think the hospital’s role is very clear, and while they’re doing that, they can help create a more robust market for the healthier foods that mitigate some of these problems.”

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Eating Away at Waste

Montefiore's New Rochelle Hospital adopts a revolutionary digester system to deal with food waste.

NEW HOSPITAL MEMBERS

UW Health, Madison, Wis.

RENEWING HOSPITAL MEMBERS

Dana-Farber Cancer Institute, Boston, Mass.

Dignity Health, San Francisco, Calif.

HealthPartners, Bloomington, Minn.

Sonoma Valley Hospital, Sonoma, Calif.

U.S. Army Medical Command (MEDCOM), San Antonio, Texas

UCSF Medical Center, San Francisco, Calif.

The University of Chicago Medicine, Chicago, Ill.

Virginia Mason Medical Center, Seattle, Wash.

RENEWING STRATEGIC ASSOCIATE MEMBER

Catholic Health Association, Washington, D.C.



Biodigesters conveniently located in New Rochelle Hospital's kitchens allow the facility to repurpose food waste into gray water.

Photos courtesy of Montefiore New Rochelle Hospital

IT'S A problem all hospitals face: What do we do with all of the food waste generated from serving hundreds, or even thousands, of patients, staff and visitors every day?

Montefiore Medical Center, with nearly 50 primary care locations throughout the New York metropolitan area, recognizes that sustainability and environmental health are essential to its mission of advancing the health of the communities it serves. Montefiore's New Rochelle Hospital produces approximately 4,200 pounds of food waste each week and pays \$120 a ton for disposal at landfills. The hospital was combining its food waste with regular trash to be sent to a landfill, but the logistics of collection, transport, storage and removal were a challenge for the organization and worsened a growing ecological problem.

With recent studies showing that nearly a third of all municipal landfill content is organic waste, which produces methane gas 25 times more damaging to the atmosphere than carbon dioxide, a more environmentally friendly solution was needed.

"At Montefiore, we understand that the state of our natural environment can have a significant impact on the health of the population. To help mitigate that impact, we are always investigating ways to reduce our overall environmental impact and carbon footprint," said Jeff Hogan, energy and sustainability manager for Montefiore Medical Center.

The health system looked at several potential solutions to the food waste problem, including dehydration and composting. While many municipalities recommend composting, this places additional trucks on the road and presents health care facilities with waste storage problems. After careful research, Montefiore ultimately settled on biodigestion as the best option available—an approach that Hogan found not only solved its food waste disposal problem, but also aligned with the medical center's sustainability goals and even improved working conditions for the food service team.

Biodigestion is a process in which organic digesters use aerobic decomposition and

hyperacceleration of the decomposition process to quickly convert waste into sewer-safe gray water.

Montefiore partnered with EnviroPure Systems, which provided a customized solution that maximized the amount of food diverted from compactors. And since the custom digesters are conveniently located inside the kitchens and accessible to the staff, they reduced labor by removing the need to transport waste to compactors or composting containers.

“Once the workers place the organic material into the unit, the machine does the rest,” said Hogan. The organic material is ground up and empties into a large storage tank, where natural organisms break down the organic matter into water that is safely discharged through the hospital’s sewer system. Decomposition is accelerated by a proprietary blend of all-natural organic nutrients called BioMix, which fuels the naturally occurring bacteria present in the food waste to increase metabolic efficiency.

“The system even has remote monitoring, so our vendor can detect any errors off-site,” said Hogan. The remote monitoring system also allows the hospital to access data on its waste reduction program and process, so it can determine how to reduce its waste even before it is created.

“There are always challenges when you introduce new technology,” said Hogan. “Space is the biggest issue with these types of projects. We were lucky in that we had some open space within one kitchen. Our second installation was quite a challenge due to the limited working space. It’s pretty amazing how they were able to accomplish their job in such a tight space.”

The biggest challenge was convincing staff that this was the right path forward, said Hogan. But once the system was installed, the benefits were experienced immediately and outweighed any resistance.

The initial unit was so successful at Montefiore’s New Rochelle Hospital that a second system was installed at the medical center’s Wakefield campus. Since the New Rochelle digester was installed in September 2014, it has processed nearly 248,000 pounds of food waste. Eliminating the need to haul the organic waste has resulted in 233,086 fewer pounds of carbon emissions—the equivalent



Montefiore worked with EnviroPure Systems on a customized biodigester solution.

of removing 21 cars from the road—and saved almost \$15,000 in pickup charges. The savings allowed Montefiore to realize a return on investment after just 34 months.

EnviroPure supplied training for staff when the unit was installed, and is available to provide annual training for the kitchen staff to help account for employee turnover and maintain awareness. “Getting buy-in from the staff is critical to making a zero-waste strategy work,” Hogan said. “Everyone has to believe in the cause, and proper training is critical.”

EnviroPure’s guarantee regarding effluent discharge levels was also important to Montefiore. The facility wanted to ensure that the end product would not corrode pipes, and also wanted the option of repurposing gray water for future use without worrying about harmful effluent levels. While the gray water produced by the food waste digestion is currently being discharged through the sewer system, in the future, Montefiore plans to evaluate the potential to incorporate this continuous and sustainable water source into the facility’s irrigation lines.

With the first two biodigesters being such a success, what does the future hold for Montefiore’s food waste system? Solutions are site-specific, said Hogan, and while they are not able to force a digester into locations without sufficient space, the health care system is currently looking toward all campuses potentially adopting the digester technology.

Montefiore’s dedication to sustainability is also being recognized in its local community. In June, Montefiore earned the Westchester Green Business Certification, which is given to organizations that are leaders in incorporating sustainability into all aspects of business. The hospital was recognized for successfully saving millions of gallons of water, preserving landfill space and significantly reducing its carbon footprint by investing in green technologies such as the biodigester.

“Sustainability is a team effort,” said Tony Alfano, Montefiore New Rochelle’s vice president and executive director. “By working closely with our engineering department, we have been able to eliminate organic waste from garbage—and create a healthier environment for our community.”

On the Move

Inova Health System partnered with MedSpeed to drive its transportation logistics to the next level.



Inova Health System

Changes to Inova Health System's transportation network were part of a larger effort called "Onelnova."

A NORTHERN Virginia health system has found that good environmental stewardship and an efficient operation go hand-in-hand when it comes to internal transportation, otherwise known as intracompany logistics.

Inova Health System is a complex network of hospitals, outpatient facilities, physician practices, and health and wellness initiatives that serves more than 2 million people a year. That makes for an equally complex method of getting physical materials—blood samples, lab results, medical equipment, pharmaceuticals, supplies and more—from one location to another.

Inova wanted to make its internal logistics more efficient while at the same time improving patient care and helping the environment. In 2013, Inova hired MedSpeed, a company that helps health care facilities integrate the movement of physical materials through intracompany logistics. The company works with some of the country's largest health systems, spanning 27 states.

"We engaged MedSpeed because they were the only organization that viewed transportation as more than just a courier service," said Lance Greene, director of supply chain operations for Inova.

"Before implementing the MedSpeed changes, the health system had four separate transportation components, each with separate management oversight and budget responsibilities," said Kathy Benn, vice president of solutions development at MedSpeed.

"Sometimes multiple vehicles could be at the same site at the same time. And although the laboratory represented the largest component of intranetwork transportation operations, its transportation network operated independently."

"MedSpeed helped centralize drug purchases to reduce costs and implemented a mechanism for sharing pharmaceuticals within the network to prevent inventory issues," Greene added. Meanwhile, leadership also felt Inova was overusing an expensive urgent delivery service for time-sensitive requests.

MedSpeed started by collecting movement and cost data from Inova. Benn explained, "My role at Inova was to coordinate the assessment work with our analytical team. We took a comprehensive look at the health system's entire transportation operation systemwide and found fragmentation. The pharmacy had resources moving things; the lab had resources moving things. There was a duplication of effort and

“We have a team of analysts, and we meet with the client quarterly. We measure route efficiency statistics, customer satisfaction and on-time reliability. If we don’t meet the contractual service level agreements and milestones, we’re financially penalized.”

—KATHY BENN, VICE PRESIDENT OF SOLUTIONS DEVELOPMENT, MEDSPEED

limited visibility into what scheduled service existed [that] could be leveraged by other functional departments.”

Once MedSpeed had gathered the information about individual activities and time sensitivities, the company’s analytical team worked collaboratively with the Inova team to develop a more streamlined logistical operation. Benn said the new logistical operation has routing to support time-sensitive movements that need to get to their destination quickly, and there is flexibility for emergencies.

“For lab tests, there are sample viability issues,” she said. “They can’t ride around in a vehicle all day, and temperature states must be maintained appropriately.”

The change has helped Inova take other costs out of the system as well. For instance, a pharmacy that orders a 12-pack of a medication or supply while only needing two items can easily send the remainder to another facility that might need the same item, at no—or very little—extra cost. Medications that may potentially expire can be repositioned in another facility that can use them prior to expiration.

“Transportation is typically only 1 percent of a hospital’s or health system’s budget, but it touches and has impact on the entire system,” said Bonni Kaplan Dewoskin, vice president of marketing for MedSpeed. “Done right, intracompany logistics can create ongoing value by using transportation as an asset to drive savings on the 99 percent of



MedSpeed assists health systems in 27 states with intracompany logistics.

expenditures that are outside of transportation, but still impacted by it.”

Chip Goyette, director of sustainability for Inova, said the changes to its transportation network were part of a larger effort to become “OneInova,” a network with an expanded centralized service center.

“The supply chain team realized it needed to build the required infrastructure network to intelligently connect its network and meet its ‘systemness’ and sustainability goals by driving integration and standardization, while removing waste and inefficiencies,” he said.

According to MedSpeed, opportunities to streamline transportation operations and find value opportunities don’t end once operations begin. The MedSpeed team continuously collects and analyzes data and uses that information to make recommendations for network enhancement. For instance, MedSpeed recently worked with Inova’s lab team to closely analyze and compare site pickup times with specimen counts collected at those sites. MedSpeed recommended the deletion of numerous stops with low specimen yields to eliminate 1,400-plus extra miles driven per week and add other efficiencies. Patient care result turnaround times were maintained, and specimen flow into the

lab was not negatively impacted, allowing for productive lab resource use.

“It’s a continuous process. We’re constantly mining data,” Benn said. “We have a team of analysts, and we meet with the client quarterly. We measure route efficiency statistics, customer satisfaction and on-time reliability. If we don’t meet the contractual service level agreements and milestones, we’re financially penalized.”

According to Kaplan DeWoskin, many health systems are expanding their footprint and patient reach, which is why it makes sense for them to outsource services like logistics. This allows their health care teams to focus more on providing patient care and lets subject matter experts focus on other areas. It also allows health systems to use vital capital dollars for more strategic investments.

The changes also help reduce greenhouse gases from vehicles in an area of Northern Virginia notorious for its traffic congestion. Inova prides itself on taking care of the environment.

“Inova has a long history of environmental stewardship and embedding sustainability within our operations,” Goyette said. “This project is a great example of how improving our environment, making our operations more efficient and, ultimately, improving our bottom line, all go hand-in-hand.”



'Bee' Green

Bees are New Jersey's official state insect, so it's no coincidence that The Valley Hospital in Ridgewood is literally a-buzz with the yellow-and-black insects.

Valley was the first hospital in the state to install rooftop beehives in 2013. With eight hives total—four at Valley and four at the Robert & Audrey Luckow Pavilion, a satellite facility in Paramus—the hospital harvests more than 100 pounds of local honey that is sold in the hospital's cafeteria and used deliciously in menus for patients, visitors and staff. The beeswax produced by the hives is also a main ingredient in the hospital's own all-natural, house-made lip balms, body butters, hand lotions, foot balms and vapor rubs. Meanwhile, Valley

estimates that the busy bees are helping to pollinate a two-mile radius around its facilities, increasing the yield of flowers, fruits and vegetables over an 8,700-acre area.

It's all part of Valley's commitment to the Healthy Food in Health Care Pledge, which it signed in 2010. "We have always been big supporters of locally produced food, and what could be more local than producing your own honey? We also like the idea of supporting the declining honeybee population while enhancing our community's gardens, foliage and trees. We want to do all we can to be as green as possible to the environment," said Dawn Cascio, director of food and nutrition services for Valley Dining. 



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