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## Q&A: How NewGen Surgical Is Redesigning Sustainable Healthcare

By Sustainable Brands

The U.S. healthcare sector is the second most intensive commercial user of energy. Hospitals are one of the largest energy users, contributing 8 percent of the U.S. greenhouse gas (GHG) emissions through the purchase of healthcare goods and services, and produce more than 4.67 million tons of waste each year. Realizing the significance of these impacts, NewGen Surgical was started in 2012 with a vision to make single-use medical devices more sustainable through their redesign and material inputs.

Striving towards a more circular economy for healthcare, NewGen Surgical aims to protect the health of people and the planet by eliminating chemicals of concern and toxicity, reducing energy and non-renewable resources, reducing the amount of plastic produced, used and discarded, and reduce or eliminate plastic waste going to landfill or incineration.

We spoke to Rob Chase, founder and President of NewGen Surgical, to learn more.

**While we constantly hear about sustainability efforts being made by the manufacturing, textile, food and fashion industries, for example, there seems to be less momentum in healthcare, despite the growing link between human and environmental health. Why do you think this is? Can you give us a quick overview of the current state of the healthcare industry with regards to sustainability?**

Many in the healthcare industry — doctors, nurses, hospital leadership — recognize the strong connection between human health, the environment, and their mission to care for people and support healthy communities. While there seems to be less connection and attribution from the supply chain that contributes to the waste and pollution generated while delivering care. However, this is changing. Several organizations, some international, are advocating for more sustainable practices in healthcare. A select group include Alliance of Nurses for Healthy Environments, Climate and Health Alliance, Doctors for Climate, Health Care Without Harm, and Practice Greenhealth.

There is a growing market demand by hospitals for innovative, sustainable product solutions; however, to date, the medical device and product industry has not responded in a way to meet that demand.

It's a complicated space with so many pressing changes in healthcare — hospitals and supply chains need to meet a growing need, at lower prices and in more complicated pay scenarios. Adding sustainability to product considerations can sometimes be seen as adding more complexity to an already taxed system. However, the increasing value put on connecting climate-smart purchasing to healthier outcomes and communities is making this an equation one cannot ignore in healthcare.

We have seen other industries offer sustainable product innovation that creates differentiation. In healthcare, however, the focus has been, and continues to be, around cost and ease of use resulting in more single-use, disposable plastic medical products. What we need are products that meet clinical efficacy criteria, but minimize the environmental impact throughout the life cycle of the product.

Healthcare has been able to take advantage of other cross-industry sustainability initiatives, such as LEED building design, local sourcing of healthy food, moving to renewable energy, smarter transportation, and the elimination of toxic chemicals in cleaners. What is missing is the sustainability solution specific for healthcare and the redesigning of existing products with human and environmental health as design criteria. Change will most likely be ignited by small, innovative medical device companies, who see an opportunity to differentiate themselves with sustainable versions of the traditional surgical products.

**Why did you start NewGen Surgical? How are you helping healthcare transition to a more sustainable model?**

NewGen Surgical was founded on an idea to create sustainable surgical products — and a personal desire to make a difference in the healthcare industry — knowing that as a society, we need to act now to mitigate climate change and the pollution of our environment.

NewGen Surgical is now helping the healthcare sector transition to a more sustainable model by creating a new supply chain based on renewable input materials and moving away from our dependence on petroleum and single-use plastics. By creating products that meet all the performance and clinical needs, while eliminating the plastic (production and waste) associated with single-use products, we are demonstrating a path forward for a more sustainable future for healthcare.

We have also built a great team of people committed to our mission. With a collective concern about climate change, use of non-renewable natural resources, waste and plastic pollution in our environment, and the affects it has on our health and our planet, all of us at NewGen Surgical believe it is our responsibility to put our respective skills to work protecting our environment.

Being an environmental steward begins with our mission to pioneer a change in healthcare that will disrupt using non-renewable resources that cause unhealthy pollution in the production and disposal of medical products.

### Why is there a need for sustainable surgical products?

Most materials procured by a hospital ultimately become waste, resulting in nearly 13,000 tons of waste per day across the United States healthcare industry; 30 percent from operating rooms. It is also estimated that one million tons of the annual waste can be attributed to plastic packaging and plastic products.

If we can reimagine the single-use, disposable medical product that is used every day, in every surgical procedure, in every hospital across the nation, our products would be able to eliminate tons of plastic waste — year after year. Having sustainably designed surgical products in the market allows healthcare systems the opportunity to still deliver quality patient care while protecting the foundation of all community health — a healthy environment. Hospitals recognize the connection between healthy patients and a healthy environment, and the healthcare community is demanding products that lessen the environmental impact of delivering patient care.

Our first product, the only sustainable skin stapler on the market, is made with 69 percent plant-based material. After use, skin staplers are disposed of in sharps bins and are either incinerated or sterilized and sent to landfill. Converting to a NewGen Surgical product is not a one-time investment for a sustainability initiative, but an action that achieves measurable results in the reduction of plastic used and discarded for every single-use disposable product. A large healthcare system using 40,000 skin staplers per year could replace their existing plastic product and reduce their sharps weight by one ton and avoid 1.8 tons of plastic in the waste stream. There are approximately 18 million single-use skin staplers disposed each year in the U.S.; that is potentially 630 tons of plastic that could be avoided in the landfill with the replacement of one sustainable product in one year.

Our second product line is a needle counter. Conventional plastic needle counters are made from high-intensity polystyrene (HIPS) plastic and are not eligible for recycling in this application. In a landfill, HIPS does not readily biodegrade[1]. If incinerated at 800-900 degrees C (the typical range of a modern incinerator), HIPS produces a complex mixture of polycyclic aromatic hydrocarbons (PAHs) from alkyl benzenes to benzoperylene. Over 90 different compounds were identified in combustion effluents from polystyrene[2].

### What trends are you seeing in healthcare? How are these trends shaping innovation at NewGen Surgical?

Hospitals are seeking sustainable solutions. The healthcare industry continues to struggle to make healthcare systems more sustainable, but there are signs that the industry is poised for major disruption. Growing demand — from both consumers and healthcare leadership — and the rapid advance of technology is making the industry ripe for change.

Healthcare has been developing a broader, more consumer-centric approach that focuses on wellness and prevention, and on continuous management of health. This new model encompasses economic, social and other aspects of the consumers' lives. Concerns about enhanced wellbeing, improved health outcomes, climate change, and the environment all contribute to a demand for more sustainable solutions.

Innovation takes place in healthcare all the time. NewGen Surgical is reimagining the single-use disposable one-and-done item with sustainable materials to achieve a tremendous impact on plastic pollution.

### What has the impact of NewGen Surgical's products been to date? What feedback have you gotten from healthcare institutions?

This is a great question. We launched our Small Change, Big Impact EPP™ program on June 5, 2018, World Environmental Day, themed “Beat Plastic Pollution.” This program will help our customers calculate and communicate the tons of plastic waste eliminated through the transition to our sustainable medical devices and products. This is a huge benefit for them as metrics can help illustrate the massive impact one small purchasing decision can have for the environment and healthy communities. We have received very positive feedback and were able to kick off the program with Dignity Health as a pioneer member. We look forward to sharing the metrics as we get further along.

### What are some of the main challenges of developing surgical products that are sustainable, safe and effective?

The most challenging hurdle in creating sustainable surgical products is finding the material that can handle the performance and sterility criteria for O.R.s, is available to scale, and is price competitive. Healthcare is extremely cost-sensitive and does not want to pay more to go “green.” Therefore, finding a material that meets our performance and economic objectives can prove challenging.

In the meantime, we get our inspiration from the Sustainable Brands community. We look for the innovations that take place in other industries to see if there is opportunity for a healthcare application.

### How do you choose your materials? Can you speak to any products or materials you have in development?

Using Smart Sustainable Design criteria to guide us, we go as ‘green’ as we can with the design and development of new products. For each product, this may be different. The goal is to be as sustainable as possible, while delivering similar clinical performance at little to no additional cost.

Using this model, our first products are created from upcycled sugarcane fibers. I was really intrigued by the concept of upcycling when I was looking for a sustainable material for our first product, the surgical skin stapler.

This transition from petroleum-based to post-agricultural-based products can indirectly help in reducing the pollution and energy consumption associated with the production of the product. In addition, the sugarcane has a growth rate between two to three times a year to provide a tree-free renewable resource — an excellent alternative to petroleum-derived products. This feedstock is one of our favorites given its properties — per its life cycle analysis and in the O.R.

### Beyond reducing waste, what other benefits do sustainable surgical instruments offer?

There are upstream and downstream benefits to NewGen Surgical products.

Upstream, plastic manufacturing is estimated to use 8 percent of global oil production annually. The EPA estimates as many as five ounces of carbon dioxide are emitted for each ounce of polyethylene (PET) produced. And plastics manufacture makes up 4.6 percent of the annual petroleum consumption in the U.S., using roughly 331 million barrels per year. None of this energy is recovered when plastics are disposed of in landfills, and very little is recovered when plastic waste is incinerated.

Downstream, traditional plastic from single-use disposables is not eligible for recycling due to its medical waste status; they are destined for landfill or incineration.

### Hospitals are complex institutions. How can we ensure that sustainability is marked as a top priority?

Much like the healthcare industry's emphasis on treating root cause, healthcare professionals understand there is a correlation between healthy people and a healthy planet. By broadening a hospital's mission of patient care to community needs and scrutinizing their own operations and pollution created, hospitals recognize sustainable initiatives as a way to deliver patient and community health. They want to be a part of the solution, and at the very least, not to be part of the problem. As one doctor said to me, "It's connecting the dots. I'm in here helping someone with asthma, and then I am sending my patient back out to breathe the unhealthy air, and perhaps in an environment I helped pollute. So, whatever I can do, I will do. If I have a healthier choice, I will make that choice."

Hospitals are being challenged by our growing climate crisis and are actively seeking ways to mitigate the waste contributed by their industry and curtail the effects of climate change. While sustainability may not be a top priority, it is definitely becoming interwoven into business operations through clean energy, environmental preferable purchasing policies and better waste management.

In addition, there needs to be an incentive from a policy perspective to make the kind of change that will make a difference. Early on we got support from the THINK BEYOND PLASTIC innovation incubator, founded by Daniella Russo, focused on plastic solutions and advocacy. This led to our participation at the Our Ocean Conference run by then Secretary of State John Kerry in 2014, and exhibiting at the Capitol Hill Innovation Showcase in 2015. In June 2018, NewGen Surgical has been invited to the California State Capital for a roundtable discussion exploring the role of public policy to accelerate the innovation of California's New Plastics Economy.

There are also individual leaders, like Sister Mary Ellen Leciejewski, Vice President of Corporate Responsibility at Dignity Health; Kathy Gerwig, VP Employee Safety, Health & Wellness and Environmental Stewardship Officer of Kaiser; and Gary Cohen, president and founder of Health Care Without Harm, who are major voices and change makers for greener operations in healthcare — that healing patients and running healthy operations are not exclusive of each other.

The best summary I have seen to date is from The Lancet — "For improved planetary health to be realized, it is important that sectors that are impacted by environmental change, such as health, take a proactive role in understanding their own environmental impact. It is no longer sufficient to simply quantify the problems we face; healthcare systems need to be much more effective stewards of the resources placed at their disposal."

[1] Bandyopadhyay, Abhijit; Chandra Basak, G. (2007). "Studies on photocatalytic degradation of polystyrene". *Materials Science and Technology*. 23 (3): 307–317. doi:10.1179/174328407X158640.

[2] Bandyopadhyay, Abhijit; Chandra Basak, G. (2007). "Studies on photocatalytic degradation of polystyrene". *Materials Science and Technology*. 23 (3): 307–317. doi:10.1179/174328407X158640.