

## **Cradle to Cradle Approach for Designing and Managing Environmentally Responsible Medical Packaging**

The next decade will see dramatic changes in medical waste handling and disposal. The need for disposability will significantly impact the design criteria for medical devices and packaging. Supply chain management, practices in health care institutions and to some degree, procedures performed by health care providers will also be impacted. Manufacturers and Distributors that understand and embrace sustainability will have a significant competitive advantage in the marketplace. The organizations that best understand these opportunities will develop, implement, and enforce strategies that will enable them to enhance revenue, maximize profit and reap additional benefits as leaders in good corporate citizenship.

Rachel Baker, Director Environmental Programs at Kaiser Permanente a leading Health Care Provider states, “ Environmental impact and waste disposal management will continue to grow in importance with the vendor selection process. Companies that can successfully demonstrate clear and objective environmental advantages with their products, will have an advantage” Krisanne Hanson, Supply Chain management at Stanford Medical states, “There are many opportunities for improvement with environmental sustainability initiatives. It is not only the right thing to do, but it makes financial sense in many instances as well.”

U.S. hospitals produce over 3 billion tons of waste each year, with roughly 15% classified as regulated medical waste (capable of spreading infectious disease). This volume continues to rapidly increase as hospitals struggle with a triple threat of challenges including cost containment, environmental impact, and protection of staff and patients from the spread of infectious disease. Single use sterile medical devices developed in the 1940s (in an effort to reduce patient infections), spawned a multi-billion industry that continues to grow at double digit rates each year, adding significantly to the waste stream. Strict environmental regulations were enacted by Congress in the 1990s as used syringes were found on East Coast beaches due to improper waste management. This dramatically impacted public safety, and ultimately cost. Consequently, the entire Health Care supply chain including manufacturers, distributors and hospitals, will need to work collaboratively in developing strategies with optimum solutions.

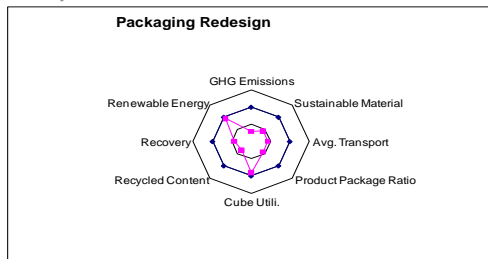
A clear understanding of waste management processes at hospitals, is fundamental to the ultimate solutions. Significant changes are underway in terms of managing both regulated and non regulated medical waste. Transition over the last several years from waste to energy (on site incineration), is now evolving toward technologies that disinfect waste, disposing it via the municipal waste stream, typically through landfill and limited recycling efforts. Hospitals also made great strides in reducing the regulated waste stream (\$600-\$800 per ton) to the non regulated waste stream (\$30-\$40 per ton) over the past two decades, and we have significant opportunities to continue with this progression in the future.

Medical Packaging contributes between 30-50% (or more) of the medical waste stream, and is fast becoming a focal point of opportunity. Hospital groups such Kaiser Permanente and Stanford Medical are beginning to evaluate sustainable packaging in the purchase decision process, as well as realizing the cost benefit and improved regulatory compliance when done correctly. Device manufacturers and

Distributors that understand and embrace package sustainability in turn, enjoy significant competitive advantage in the marketplace.

Sustainable packaging design starts at the point of manufacture. Life cycle analysis using a cradle to cradle approach can effectively measure several metrics through mathematical modeling, resulting in a weighted average that provides the best solution. Although still developing and evolving, there are several software applications that have been in use. The Walmart model <http://www.scorecardmodeling.com/> is widely recognized in retail markets, with growing applications in medical device markets. The example below defines a clear environmental benchmark analysis.

### Package Modeling: Comparison of Environmental Indicators



\*\*smaller numbers (data points closer to the center) are preferred.

### Sustainable Package change

- ▶ **CURRENT DESIGN:**
- ▶ Rigid PETG tray
- ▶ Coated Tyvek
- ▶ Paper insert
- ▶ Printed IFU

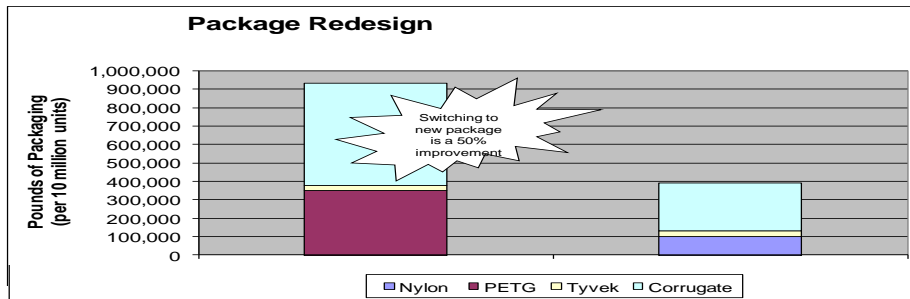
- ▶ **PROPOSED DESIGN:**
- ▶ Flexible nylon film
- ▶ Uncoated paper
- ▶ Eliminate paper insert
- ▶ CD and web page replace IFU



Several hospitals are evaluating this tool in an effort to objectively evaluate sustainable packaging as part of the purchase decision process, and view this as an effective method to avoid “greenwashing” claims. Progressive device manufacturers may use this tool to competitively benchmark their products in an effort gain advantages in the market place. In addition, companies and end users can establish Environmental strategies including goals, metrics and tangible data to support product and packaging claims. In addition, companies position themselves in a progressive format to meet or exceed growing global environmental compliance such as the German Green dot legislation. Additional cost modeling can be done to demonstrate not only savings opportunities for device manufacturers and distributors,

they can also demonstrate actual savings for hospitals as well (example).

## Package Materials: Disposal Impact



19  
1

Although recycling efforts are strong in paper and paper by products throughout the supply chain, plastics have yet to make major inroads at most hospital locations. Device manufacturers can help in this area by minimizing or eliminating the use of PVC and DEHP, standardizing materials that better meet environmental needs, and work on source reduction efforts on programs such as e labeling vs. paper and booklet inserts in markets that readily accept this technology. Distributors and manufacturers can work with organizations such as Kaiser Permanente that successfully implemented the reusable totes in handling product as well as recycling efforts with sterile wrap and other materials.

When done correctly, there are significant opportunities for manufacturers, distributors and hospitals to work collaboratively on solutions that will provide many benefits to all stake holders.

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