



# Environmentally Preferable Purchasing in the Health Care Sector

**Health Care Without Harm**

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### HCWH Asia

Unit 330, Eagle Court Condominium,
26 Matalino Street, Brgy. Central Diliman,
Quezon City 1100 Philippines
ph: +63 2 9287572
fax: +63 2 9262649
e: sonia@no-harm.org
www.noharm.org/seasia

### HCWH Latin America

Tamborini 2838
1429 Buenos Aires, Argentina
ph/fax: +54 11 4545 7204
e: info@saludsindanio.org
www.saludsindanio.org

### HCWH International Coordination

Tamborini 2838
1429 Buenos Aires, Argentina
ph/fax: +54 11 4545 7204
e: alejandra@hcwh.org
www.noharm.org/global

### HCWH Europe

Rue de la Pepiniere B1000
Brussels, Belgium
ph: +49 6224 994871
ph: +32 2503 0481
e: anja.leetz@hcwh.org
www.noharm.org/europe

### HCWH USA and Canada

12355 Sunrise Valley Dr., Suite 680
Reston, VA 20191 United States of America
ph: +1 703 860 9790
fax: +1 703 860 9795
e: cfunkhouser@hcwh.org
www.noharm.org/us_canada


www.noharm.org

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# Introduction

Today, roughly a quarter of all human disease and death in the world can be attributed to what the World Health Organization (WHO) broadly defines as environmental factors. These include unsafe drinking water, poor sanitation and hygiene, indoor and outdoor air pollution, workplace hazards, industrial accidents, automobile accidents, climate change, poor land use practices and poor natural resource management.[1]

For children, the rate of environmentally caused deaths is as high as 36 percent. Environmental health factors play a significantly larger role in developing countries, where water and sanitation, along with indoor and outdoor air pollution, make major contributions to mortality.[2]

The contribution of environmental factors to the burden of disease will be magnified and increased with the growing health-related impacts of climate change. These include shifting patterns of disease, water and food insecurity, vulnerable shelter and human settlements, extreme climate events, heat related illness and population migration. The magnitude of these multiple looming crises led *The Lancet* to declare in 2009 that "Climate change is the biggest global health threat of the 21st century," and will "put the lives and wellbeing of billions of people at increased risk."[3]

## The Role and Responsibility of the Health Sector

The health sector's mandate is to prevent and cure disease. Yet the delivery of health care services — most notably in hospitals –- often inadvertently contributes to the problem. Hospitals generate significant environmental health impacts both upstream and downstream from service delivery, through the natural resources and products they consume, as well as through the waste they generate.

Until recently, there have been limited metrics to gauge the scale of the issues, but emerging data confirms the significance of the health sector's environmental impacts. For instance, the National Health Service (NHS) in England has calculated its carbon footprint at more than 18 million tons of $CO_2$ each year –- 25% of total public sector emissions.[4] Brazilian hospitals use huge amounts of energy, accounting for more than 10 percent of the country's total commercial energy consumption.[5] In the U.S., the health care sector is the single largest user of chemicals, many of which are known to cause cancer. In China, health care construction spending exceeds $10 billion a year and consumes significant amounts of natural resources.[6] There are many more examples.

The environmental health impact of hospitals should come as no surprise given the health sector's huge economic clout. In 2007, world health expenditures totaled US$5.3 trillion,-- US$639 per person per year, or roughly 10% of global Gross Domestic Product (GDP).[7] Health care's percentage of GDP, as well as overall per capita spending on health care, varies widely between nations, and there are significant health inequalities within countries as well. Yet the environmental health impacts come in all shapes and sizes, ranging from pathogenic medical waste dumped in back of a rural clinic during a vaccination campaign, to the air pollution generated by the energy consumption of a high-tech tertiary care facility in a large urban area.

The health care sector is also just beginning to understand the impact that environmental problems such as climate change will have on health care services delivery. As average temperatures rise, heat island impacts in dense urban areas will exacerbate chronic respiratory conditions in the elderly and children. More extreme weather events –- hurricanes and typhoons in coastal areas, tornadoes and floods, fires and drought –- will require a more resilient emergency care infrastructure capable of delivering potable water as well as health care services. Even in developed countries such as the US, where energy intensive health care infrastructure emergency backup is commonplace, the inherent lack of resilience in sealed, grid-dependent buildings has proven to impact continued operation during extreme weather events. The imperative to adapt to this reality is growing by the day.

Hospitals and health systems everywhere have the potential not only to adapt to the scourges of climate change, but also, in the process, to promote sustainability, greater health equity and environmental health through investing in healthier buildings, purchasing green, and implementing sustainable operations. Hospitals and health systems can leverage their economic positions and moral standing in a community, to help achieve both the Millennium Development Goals related to health and sustainability, while also helping foster a green economy.[8] Indeed, hospitals and health care workers can be leading promoters of environmental health, by modeling environmentally sustainable, economically sound practices for the broader society and global community.

# Health Care Without Harm

Health Care Without Harm is an international non-profit organization working to embed a sustainability framework into the health sector. HCWH has regional offices in Asia, Latin America, North America and Europe, and partner organizations on every continent. HCWH works with health professionals, hospitals, health systems, ministries of health, NGOs and international organizations in a broad array of socio-economic settings.

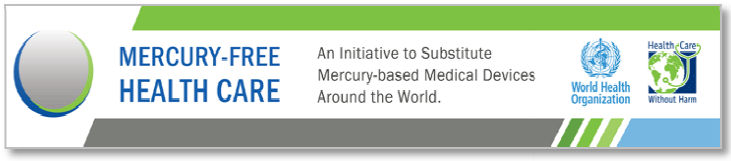
HCWH's strategy is to educate the health sector about the latest science linking the environment and health, assist hospitals and clinics to reduce their environmental footprint, leverage the purchasing power of health care institutions and elevate health professionals as key messengers for policies and practices that will protect community and global health.

A core dimension of HCWH's work over the last seventeen years is to support environmentally preferable purchasing (EPP) throughout the sector and utilize collective demand to support market and policy transition to safer alternative products and technologies. This document provides more detail about HCWH's EPP strategy and offers concrete examples of the tactics and tools that HCWH has deployed to implement its purchasing strategy.

# Substituting Chemicals of Concern

Chemicals of concern in products contribute significantly to the overall chemical footprint of health care. Chemicals can have a negative impact on health and the environment throughout their lifecycle, from extraction, production, and transportation through use and disposal. HCWH has been focused on moving the health care sector away from chemicals of concern to safer alternatives since its inception. Areas of focus include mercury, PVC plastics, phthalates, cleaning chemicals, flame retardants, disinfectants, pesticides, hazardous chemicals in building materials and furnishings, pharmaceuticals and classes of chemicals known as CMRs (carcinogenic, mutagenic or toxic for reproduction).

## Mercury Substitution




The world's governments have recognized Mercury as a chemical of global concern due to its long-range transport in the atmosphere, its persistence in the environment, its ability to bioaccumulate in ecosystems and its significant negative effect on human health and the environment.[9]

Methyl mercury, at extraordinarily low doses, impairs fetal neurological development. When a woman eats seafood that contains mercury, it accumulates in her body, requiring months-to-years to excrete. If she becomes pregnant within this time, her fetus is exposed to methyl mercury in the womb, which adversely affects the fetus' central nervous system. Methyl mercury impacts on cognitive thinking, memory, attention, language, and fine motor and visual spatial coordination.

The health care sector is far from the greatest source of organic mercury compounds in the environment. Rather, coal-fired power plant emissions and small scale gold mining are far more significant polluters. However, the health care sector does play a significant role as a source of global emissions, as well as a source of low-level, chronic and acute elemental mercury poisoning. Given its ethical underpinnings to "first, do no harm", it makes sense that health care should lead the global effort to eliminate mercury exposures and prevent serious health impacts related to its contamination of our food supply.

HCWH has been involved in a fifteen year campaign to eliminate the global use of mercury in the health care sector. This campaign has included both market and policy dimensions, but the core strategy involved working with health care purchasers to replace mercury-based, measuring devices with accurate and safer alternatives. By utilizing the collective purchasing power of health

care, HCWH and its many partners achieved three objectives:

- Eliminated mercury emissions from health care by progressively replacing its use with safer, accurate and affordable alternatives.
- Promoted health care sector leadership in the global reduction of mercury emissions.
- Promoted the adoption of healthy public policies with regard to mercury at national, regional and global levels.

In the United States, the campaign involved developing model specifications for mercury-free alternatives and working with over 5,000 hospitals and their Group Purchasing Organizations (GPOs) to change their purchasing practices. It also involved convincing the nation's pharmacy chains to change their purchasing practices to stop selling mercury thermometers and replace them with digital thermometers instead. In Europe, policy change was the lever to eliminate the market for mercury medical products, when the EU issued rules in 2007 and 2012 phasing out mercury thermometers and blood pressures devices, respectively.

In developing countries, HCWH teamed up with WHO to launch a Global Initiative for Mercury-Free Healthcare (www.mercuryfreehealthcare.org) that supported mercury-substitution in a broad diversity of health care settings. This work was supported by the U.S. EPA in Latin America and the Swedish Chemicals Agency in South East Asia. In both regions HCWH worked in multiple countries to support the development of purchasing policies at the hospital, regional health system and national ministry levels.


This resulted in policies that moved purchasing away from mercury devices and toward the alternatives in countries ranging from the Philippines, India, Indonesia, Nepal and Mongolia, to Argentina, Chile, Mexico, Costa Rica and Brazil. Similar work has been carried out in South Africa, and through the UNDP Global Healthcare Waste Project in Tanzania and Senegal.[10]

At the global level, HCWH worked with the World Health Organization and United Nations Development Programme Global Healthcare Waste Project to create a technical guidance document for purchasing of mercury-free devices.[11] HCWH and WHO also collaborated at a global level to demonstrate the viability of a global phase out of mercury in health care. This helped enshrine the total phase-out of mercury-based medical devices in the Minamata Convention, a U.N. sponsored treaty that addresses the global

mercury pollution which will be signed by the world's governments in October 2013.

## Safer Plastics

HCWH has had a long-range strategy to phase out "worst in class" plastics from health care product supply chains and to work with the sector to implement benign-by-design green chemistry alternatives. Polyvinyl chloride (PVC) plastics are some of the target products for replacement due to two factors. First, PVC is a chlorinated plastic that produces dioxin as an unwanted by-product in both the production stage and destruction stage through incineration. Due to the high PVC content in hospital waste, medical waste incinerators were the largest source of dioxin emission in the United States in the mid-1990s. PVC also requires plasticizers to make the material pliable for use in medical equipment. The chemical used in PVC medical equipment is DEHP, which does not bond with the plastic and leaches into patients and off-gasses into the health care environment.

DEHP has been recognized by authoritative bodies as a reproductive toxicant. A number of government agencies and expert panels in Europe[12], the US[13], Canada[14], and Japan[15] have reviewed the safety of DEHP. Each of these agencies and expert panels has found that DEHP exposure from some medical procedures may pose a risk to patients' health. The US Food and Drug Administration has issued an FDA Safety Assessment and a Public Health Notification urging health care providers to use alternatives to DEHP-containing devices for certain, vulnerable patients. The South Korean FDA requires manufacturers to label all medical devices containing PVC and DEHP with a warning about the toxicity of DEHP.

In Europe DEHP is on the candidate list under the chemicals law REACH, where authorization needs to be granted for certain uses because of its reproductive toxicity[16]. Depending on the number of authorization applications received to the European Chemicals Agency, there will be time-restricted authorizations for DEHP in the future. It is important to know that medical devices are exempt under REACH. Medical products fall under the Medical Device Directive. This means any restrictions for medical devices needs to be achieved within this legislation.

HCWH developed the patient safety and environmental case for replacing PVC plastics with safer alternatives and then worked with large health care purchasers in the US to implement procurement specifications and signal the market to supply the alternatives. We also produced listings of PVC and DEHP-free products to help

facilities to identify alternatives to some of the products they were using[17] [18] [19].

A successful example of the Environmental Preferable Purchasing (EPP) strategy was Kaiser Permanente (KP), which buys 4.9 million IV tubing sets and 9.2 million IV bags per year. The largest non-profit health care system in the U.S., KP was able to switch to PVC-free and DEHP-free alternative bags, save money in the process and achieve a 100-ton reduction in medical supplies by making the switch.

Dignity Health, a large Catholic health care system which also made the switch to PVC-free IV bags, achieved a five year total of 1.9 million pounds of PVC removed from IV containers and 478,000 pounds of hydrochloric acid not released to the environment (in the production of PVC plastics).

The elimination of PVC plastics is a major purchasing goal of the Healthier Hospitals Initiative, a three year campaign involving 700-plus hospitals to embed sustainability as a core business strategy into the U.S. health care system.[20]

In Europe many hospitals in western and northern countries have been working on replacing PVC-containing medical devices with PVC-free material for over a decade. The work of the Children's Hospital Glanzing in Vienna, for example, led to a change in procurement at the Vienna Hospital Association and a change of the City of Vienna procurement guidelines. A report on this 10-year effort was published in the *Journal of Environmental Science and Engineering 2011*.

# Greener Cleaners

The use of toxic chemicals in cleaners is a concern for the health care sector, both from an environmental perspective and employee and patient health perspective. Nurses have some of the highest asthma rates of any profession due to their constant exposure to toxic chemicals, sterilizing agents and other chemicals of concern in the indoor health care environment. HCWH developed model specifications for purchasing greener cleaners using third-party certification organizations (e.g. GreenSeal[21]) and then worked with leading hospital systems to support market adoption in the US.

In the European market, the City of Vienna has developed a disinfectant database to enable public procurers to purchase cleaning products. This initiative is part of the ÖkoKaufWien, a large City-wide project for sustainable public procurement. The database is primarily intended for people responsible for selecting disinfectants - i.e., safety and sanitation commissioners, hygienists and environmental work groups in hospitals and care facilities, occupational health experts, public health officers, pharmacists as well as central procurement officers and disinfectant producers. It is an information platform that contains comprehensive data sets on the effectiveness as well as the human-toxicological and eco-toxicological properties of commercially available disinfectants with the objective of providing a basis for carrying out product comparisons.

Manufacturers that want their products included in the database need to provide all active ingredients contained and their exact concentration, an up-to-date products data sheet and safety data sheet. Since the City has been training their procurement staff in how to use this database and has based procurement decisions on the database, companies have a vested interest in having their products included in it. There is now the recommendation to use this database beyond Vienna and include the whole country of Austria. The English version allows international procurers to use the system to find out more about products and their environmental and health impacts. The toxicological data available for many hazardous substances is still incomplete and therefore limits the database. Data gaps are clearly identified with a question mark in the assessment grid.[22]

## Case Study: Stockholm County Council Environmental Programme, Sweden

In Sweden the County Councils are responsible for procurement in the part of the public sector to which hospitals and public transport belong. Stockholm County Council's current five-year

environmental policy programme (2012-2016) sets clear goals on transport, energy, chemicals, foodstuff and pharmaceuticals and procurement of goods for the public sector (hospitals, dentists, city transport, etc.). Stockholm County Council has a phase-out list for chemicals hazardous to the environment and human health. It is made up of sub-lists for phasing out and reduction of chemical substances and covers chemicals, articles and consumables and chemical products used in laboratory activity. Articles and products containing listed chemicals should not be procured by Stockholm County Council. The list is always used in procurement of chemical products, as well as in procurement of articles and consumables containing chemicals. . Stockholm County Council performs follow-ups of the agreements, where the suppliers report how the requirements are fulfilled. The County Council has also initiated spot-checks, where products have been chemically analyzed to ensure that the declared content of a product is correct. If the product contains substances on the list, measures will be taken that in the end can lead to termination of contracts with suppliers. [23]

# Pharmaceuticals

Pharmaceutical residues have been found in aquatic systems worldwide and constitute a well documented health and environmental concern that is likely to rise in the future.

HCWH Europe is working for the reduction of prescribed pharmaceuticals, endorsing take back schemes of unused pharmaceuticals and supporting the adoption of innovative wastewater treatment methods as well as the development of environmentally benign pharmaceuticals.

## Case Study: Environmentally Classified Pharmaceuticals, Sweden

Ten years ago the Stockholm County Council introduced an initiative to classify medicines according to their impact on the environment when they are used.1 The pharmaceuticals were classified in terms of their inherent capacity to affect environment. Some years later the classification system was enlarged to also cover a risk assessment in collaboration with the Medical Products Agency, other County Councils, the pharmacies and pharmaceutical producers.

The classification system is used for taking the environment into account when deciding if pharmaceuticals should be listed on the so called Wise List, a list of recommended pharmaceuticals for common diseases in Stockholm County Council, issued by the Drug and Therapeutics Committee. About 85 percent of the GPs in Stockholm County Council follow the recommendations in the list in their prescription practices. The goal of this initiative is to protect the aquatic environment from pharmaceutical pollution and reduce pharmaceutical residues in water.

If the medical effects and safety are comparable, the drug with the most favorable total cost and environmental classification should be recommended in the Wise List and a substance with a small or moderate impact on the environment should be recommended before a substance lacking in environmental information. Recently one substance was excluded from the list because environmental data was missing.

The challenge of this voluntary scheme lies in the provision of data by the pharmaceutical companies. To date only about 50% of data is available in order to classify pharmaceuticals. Some of the missing data relates to substances that are exempt from classification because they are not considered a risk for the environment. The Swedish example of classification could be a way forward for other countries and regions to reduce the environmental impact of human consumption of pharmaceuticals.[23]

# Energy Procurement and Carbon Reduction

Operating 365 days a year, 24 hours a day, the health care sector is a major energy consumer and therefore a major producer of greenhouse gases and pollutants – and very few hospitals have the know-how or the incentive to address climate change on their own.

The estimated carbon footprint for Europe's health care sector for example, with some 15,000 hospitals, is approximately 250 million tonnes of $CO_2$ per annum, a figure similar to the emissions of international aviation and maritime transport activities of the EU27 Member States.[25] Brazilian hospitals use huge amounts of energy, accounting for more than 10 percent of the country's total commercial energy consumption.[26] In the U.S., an analysis published in the *Journal of the American Medical Association*, concluded that the health care sector was responsible for 8 percent of the country's total emissions.[27]

The health sector is responsible for seven per cent of carbon emissions from all buildings in Australia.[28] In China, health care construction spending exceeds $10 billion a year, and is growing by 20% annually and creating a significant long-term health sector climate footprint.[29] There are many more examples. Hospitals require a large amount of energy for building heating, water heating, ventilation, air conditioning, lighting, appliances and, in some cases, to produce steam. Fossil fuels are predominantly used for heating and provision of hot water, while electrical energy is used for lighting and ventilation. Green procurement strategies in all of these areas can help foster carbon reduction.

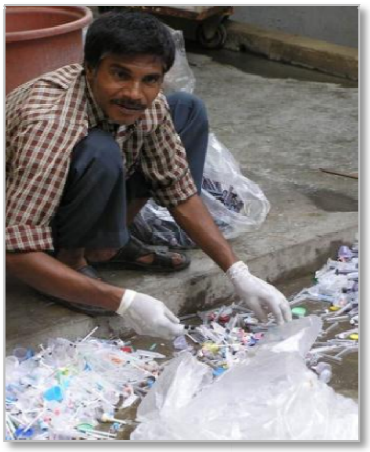
All around the world, hospitals and health systems are implementing strategies to procure more energy efficient equipment, implement energy efficiency measures, purchase and install onsite renewables and purchase sustainably produced energy offsite. Examples of significant energy and financial savings from Korea, Taiwan, Nepal, Cuba, Brazil, Poland, India, Mexico, England, Germany, the United States and other countries abound.[30]

# Global Healthcare Waste Project

Health care waste disposal can both create and disperse toxic chemicals, with incineration being one of the largest sources of atmospheric dioxins and furans. The Stockholm Convention requires the 177 countries that are parties to the convention to give priority consideration to waste treatment processes, techniques and practices that avoid the unintentional formation and release of persistent organic pollutants (POPs), such as dioxins. However, many countries lack the ability or resources to comply with these obligations.[31]

HCWH is working to overcome these problems through a number of projects, including participation together with WHO as a Principle Cooperating Agency in the UNDP-GEF Global Health care Waste Project.[32] This project has assisted seven countries - Argentina, India, Latvia, Lebanon, Philippines, Senegal and Vietnam – to develop health care waste management practices in a way that is both locally appropriate and globally replicable. The project focused primarily on activities such as procurement for waste minimization, promoting the procurement and use of non-burn technologies, improved waste segregation practices and purchasing appropriate alternatives to mercury-containing devices. In Tanzania, the Global Healthcare Waste Project has developed affordable and effective alternative health care waste treatment technologies optimized for conditions in sub-Saharan Africa.

Elsewhere, HCWH is piloting biodigestion and small-scale autoclave techniques that will help clinics and health care centers deal with infectious and pathological waste safely and economically and without creating dioxins. Both HCWH and the Global Healthcare Waste Project have also published inventories of alternative health care waste treatment technologies to help interested parties procure non-incineration technologies.



Both HCWH and the Global Healthcare Waste Project are also developing and promoting ways to neutralize chemotherapeutic drugs through simple chemical reactions. This will allow health care facilities to detoxify the small residues after treating patients and can also be used by manufacturers and central treatment agencies for larger quantities of unwanted or expired pharmaceuticals.

# Greening the Supply Chain– Practice Greenhealth

Practice Greenhealth is a U.S. affiliate of HCWH and was founded to implement environmental practices in the health care sector. Practice Greenhealth is a membership organization with 1,300 hospital members and 85 business members.

In 2011, Practice Greenhealth launched its Greening the Supply Chain Initiative to provide tools for manufacturers and purchasers to further green products offered to the sector. The Initiative includes the development of standardized chemical disclosure questions for the sector that creates an industry standard for evaluating the sustainability of medical products. The participating Group Purchasing Organizations represent over $135 billion annually in purchasing volume. EPP resources, product databases and other tools have been created as well. Product-specific environmental criteria for dozens of health care products through the EPP Supporter Program have also been created to help guide and drive green purchasing. (See appendix for list of products with environmental criteria and attributes).

The following questions have been developed for use in contracts for medical products by purchasing groups in the United States

**Questions include:**

- Is this product packaged without polystyrene?
- Will this product be classified as a non- hazardous waste at disposal?
- Is this product free of intentionally added polyvinyl chloride (PVC)?
- Does this product contain carcinogens or reproductive toxicants, as listed under Prop 65 below Prop 65 Safe Harbor levels?
- Is this product free of intentionally added phthalates: DEHP, BBP, DnHP, DIDP and DBP?
- Is this product free of intentionally added Bisphenol A (BPA) or BPA-derived plastics (such as polycarbonate plastic and resins)?
- Does this product contain less than 1000 ppm halogenated organic flame retardants?

**Possible future questions:**

- Do you know the chemical and material ingredients in this product?
- Has there been basic safety testing on each of the ingredients in this product?

# Global Green and Healthy Hospitals

Global Green and Healthy Hospitals (GGHH) is a network of hospitals, health systems and health care organizations committed to reducing their environmental footprint, through a series of actions including green procurement. Already, organizations representing more than 4,000 hospitals are participating in this Network. These include Thailand's Department of Public Health; England's National Health Service; Mexico City's municipal health system; national hospital associations from Australia, China and Indonesia, and; hospitals from countries including Argentina, Chile, Costa Rica, Colombia, China, India, Nepal, South Korea, Saudi Arabia and more.[33]

Global Green and Healthy Hospitals provides a comprehensive framework for hospitals and health systems everywhere in the world to achieve greater sustainability and to contribute to improved public and environmental health. The framework contains ten interconnected goals—including green purchasing. Each goal contains a series of action Items as well as tools and resources to assist implementation activities. GGHH members are working together on a social media platform, GGHH Connect, to implement the goals and report on their progress annually.

In the US, GGHH is represented by the Healthier Hospitals Initiative, a sector wide three-year campaign to embed sustainability practices into the U.S. health care sector. In addition to HCWH, Practice Greenhealth and the Center for Health Design, thirteen of the largest and most influential hospital systems in the U.S. are sponsoring this Initiative. Over 750 hospitals are enrolled in HHI. By aggregating the collective purchasing power of enrolled hospitals, HHI plans to move the market toward a variety of safer products and chemicals in the sector.[34]

# Appendix: Practice Greenhealth's EPP Specifications and Resources Guide

Specifications, RFP Language or Product Specific Environmental Questions exist for the products listed below, as well as short explanation of environmental issues relevant to that product.

- Apparel
- Analyzers, Reagents
- Appliances
- Asset Management
- Baby Products
- Bandages
- Battery Recycling Services
- Bedside Procedure Trays
- Bedside Products for Patients
- Blood Pressure Products
- Bone Cement
- Briefs and Underpads
- Building Materials (includes cabinetry, HVAC, water systems, lighting, etc)
- Capital Equipment
- Catheters
- Chest Drainage Reservoirs
- Computers: Desktops, Laptops, and Monitors
- Construction, Retrofit and Design Services
- Courier Services
- Disinfectants and Sterilizers
- Drapes
- DVT (Deep Venous Thrombosis) Prevention Products
- Electric and Electronic Devices: Anything that plugs in, uses electricity, or has a battery (and is not a computer)
- Equipment
- Endomechanical Products
- Enteral Nutrition Products and Feeding Sets
- Environmental Considerations for Chemical Disclosures
- Flooring
- Food (beverages, meat, dairy, grains, local food and more)
- Food Ware
- Food Ware Sources
- Furniture
- Furniture, Exam Room

- Headwalls, Clinical
- Integrated Pest Management – IPM
- Janitorial Cleaners and Supplies
- Labels, ID Bands
- Laboratories
- Laundry Cleaners
- Mattresses
- Maintenance and Operations Products
- Maintenance, Repair and Operations - Coporate Questions
- Medical Products, Standardized Environmental Questions
- Meetings/Events
- Nurse Call Systems
- Office Supplies Distribution Services
- OR Surgical Drapes
- Paint
- Packaging
- Paper and Paper Products
- Personal Care Products
- Pharmaceuticals and Vaccines
- Plumbing Products
- Positioners
- Respiratory Products
- Sterilization & Disinfection
- Surgical Instrument Cleaning
- Surgical Tourniquet Cuffs and Equipment
- Reusable Sharps Containers
- Temperature Management Devices
- Televisions
- Textiles
- Transportation
- Waste Management

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