# Selected Resources for Pollution Prevention in the Health Care Industry

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### Introduction

This bibliography supplements a poster session presented at the 2007 Health Science Librarians of Illinois Annual Meeting in Urbana, IL. The poster session is available for viewing as a slide show at

http://www.wmrc.uiuc.edu/main\_sections/info\_services/library\_docs/TN/healthcarep2sli\_des.pdf.

# **Background and Overview**

### **Books & Articles**

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Basic Information about Pollution Prevention (P2) <u>http://www.epa.gov/p2/pubs/basic.htm</u> Excellent general discussion of pollution prevention principles.

Best References: Hospital and Medical http://wrrc.p2pays.org/indsectinfo.asp?INDSECT=15

GLRPPR Sector Resources > Hospitals and Health Services http://www.glrppr.org/contacts/gltopichub.cfm?sectorid=29

Health Care EnviroNet

<u>http://www.c2p2online.com/main.php3?section=83&doc\_id=169</u> Canadian effort to promote pollution prevention and sustainability in the health care sector.

Healthcare: Pollution Prevention & Best Management Practices <u>http://www.epa.gov/ne/healthcare/bmp.html</u>

Excellent portal to environmental best management practices for all aspects of pollution prevention in the health care industry.

Hospital Pollution Prevention <u>http://www.epa.gov/region09/waste/p2/projects/hospart.html</u> Resources from U.S. EPA Region 9.

Hospitals for a Healthy Environment Online Library <u>http://www.h2e-online.org/search.cfm</u>

P2Rx Topic Hubs and Sector Resources > Medical Care http://www.p2rx.org/P2InfoNexpert/sectorInfo.cfm?SectorID=5

Partnership for Sustainable Healthcare <u>http://www.epa.gov/p2/pubs/psh.htm</u> History of EPA's involvement with pollution prevention in health care and the establishment of Hospitals for a Healthy Environment.

Pollution Prevention Topic Hub http://www.glrppr.org/hubs/toc.cfm?hub=26&subsec=7&nav=7&CFID=323722&CFTO KEN=24771982

U.S. EPA Persistent Bioaccumulative and Toxic (PBT) Chemical Program > Hospital Resources http://www.epa.gov/pbt/pubs/hospitals.htm

# **Organizations/Initiatives**

American Nurses Association Environmental Health/RnnoHarm <u>http://nursingworld.org/MainMenuCategories/OccupationalandEnvironmental/environmentalhealth.aspx</u>

Great Lakes Regional Pollution Prevention Roundtable (GLRPPR) <u>http://www.glrppr.org</u> Professional organization dedicated to promoting information exchange and networking to P2 professionals in the Great Lakes regions of the United States and Canada.

Health Care Without Harm <u>http://www.noharm.org/us</u> Global organization that advocates for more environmentally friendly health care solutions.

Healthcare Environmental Resource Center <u>http://www.hercenter.org/index.cfm</u>

Hospitals for a Healthy Environment http://www.h2e-online.org

Evolved from U.S. EPA's pollution prevention in health care initiative into its own nonprofit organization that partners with hospitals and healthcare organizations.

Nightingale Institute for Health & the Environment

http://www.nihe.org/

Although the organization ceased operations in 2006, its web site still has some good resources. Focuses on nurses and the environment.

Physicians for Social Responsibility <u>http://www.psr.org/</u> One of their primary focuses is the environment and health.

Women's Health & Environmental Network (WHEN) <u>http://www.when.org/</u>

Mission is to champion the health of women and their families by reducing environmental exposures through education, research and direct action. Their web site includes a section on healthy hospitals.

### **Facilities Management**

#### **Books & Articles**

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- Saving Energy with Energy Efficiency in Hospitals. Sittard, Netherlands: CADDET, 1999. (Online at <u>http://www.caddet.org/public/uploads/pdfs/Brochure/mb\_05.pdf</u>)

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Centre for Analysis and Dissemination of Demonstrated Energy Technologies (CADDET)

http://www.caddet.org/index.php

CADDET's objective was to enhance the exchange of information on new, cost-effective renewable energy and energy efficiency technologies. CADDET ceased collecting new information at the end of March 2005. Search using "Hospitals" to locate relevant case studies.

ENERGY STAR for Healthcare <u>http://www.energystar.gov/index.cfm?c=healthcare.bus\_healthcare</u> Energy efficiency resources targeted at healthcare facilities.

Energy Solutions for Your Building: Health Care Buildings <u>http://www.eere.energy.gov/buildings/info/health/index.html</u> Resources from DOE's Building Technologies Program.

Hospitals for a Healthy Environment > Facilities Management http://cms.h2e-online.org/ee/facilities/

P2 for Hospital Sterilizers Topic Hub http://www.glrppr.org/hubs/toc.cfm?hub=1008&subsec=7

# **Green Building**

#### **Books & Articles**

- Designing the 21st Century Hospital: Environmental Leadership for Healthier Patients and Facilities. [Concord, CA]: Center for Health Design, 2006. (Online at http://www.rwjf.org/files/publications/other/Report -Designingthe21stCenturyHospital-September2006.pdf)
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#### Web Sites

American Society for Healthcare Engineering <u>http://www.ashe.org/</u>

Hospitals for a Healthy Environment > Green Building http://cms.h2e-online.org/ee/facilities/greenbuilding/

U.S. Green Building Council <u>http://www.usgbc.org/</u>

### **Green Pharmacy**

#### Articles

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- Kriesberg, J. (2007). "Christian Daughton and the Ecology of PPCPs: An Integral Vision." Symbiosis 4(2), 14-16. (Online at http://www.teleosis.org/pdf/symbiosis/Daughton\_Integral4.2.pdf)
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- Kriesberg, J. (2007). "Pharmaceutical Pollution: Ecology and Toxicology Considerations." *Symbiosis* 4(2), 4-13. (Online at <u>http://www.teleosis.org/pdf/symbiosis/Intro\_EcoTox4.2.pdf</u>)
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GLRPPR Sector Resources > Pharmaceuticals & Personal Care Product (PPCP) Wastes & Impacts http://www.glrppr.org/contacts/gltopichub.cfm?sectorid=142

Managing Pharmaceutical Waste: A 10-Step Blueprint for Health Care Facilities In the United States (Draft) <u>http://www.hercenter.org/hazmat/pharmblueprint.cfm</u>

Pharmaceutical Waste in Health Care Facilities http://www.hercenter.org/hazmat/pharma.cfm

Teleosis Institute

http://www.teleosis.org

Devoted to developing effective, sustainable health care provided by professionals who serve as environmental stewards. Focus on green pharmacy.

# **Green Purchasing**

#### Articles

- ---. (2003). "Green Purchasing: Substituting Environmentally Preferred Alternatives." *Healthcare Hazard Management Monitor* 17(1), 1-10.
- Eagan, Patrick D. and Barb Kaiser. (2002) "Can Environmental Purchasing Reduce Mercury in U.S. Health Care?" *Environmental Health Perspectives* 110(9), 847-851. (Online at <u>http://www.ehponline.org/members/2002/110p847-851eagan/EHP110p847PDF.PDF</u>).
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- Kaiser, Barb; Patrick D. Eagan; H. Shaner (2001). "Solutions to Health Care Waste: Lifecycle Thinking and "Green" Purchasing." *Environmental Health Perspectives* 109(3), 205-207. (Online at <u>http://www.ehponline.org/members/2001/109p205-</u> 207kaiser/kaiser.pdf)
- Kaiser, Barbara A. *The Health Care Environmental Purchasing Tool Development and Pilot Testing of a New Pollution Prevention Method*. Thesis (M.S.)--University of Wisconsin--Madison, 2001.
- Livingston, J. (2003). "Being Environmentally Responsible: Group Purchasing Practices Can Help Hospitals Protect the Environment." *Health Progress* 84(1), 46-49.
- Sutherland, L. (2000). "Purchasing for a Healthy Environment." *Materials Management in Health Care* 9(9), 30-33.

#### Web Sites

Health Care Environmental Purchasing Tool (HCEPT) http://www.ahrmm.org/ahrmm/resources\_and\_tools/purchasing\_tool/index.html

Hospitals for a Healthy Environment > Green Purchasing (EPP) http://cms.h2e-online.org/ee/waste-reduction/epp/

Sustainable Hospitals Project

http://www.sustainablehospitals.org

Excellent resource for environmentally friendly alternatives to common health care products.

### Hazardous Materials & Regulated Medical Waste Management

#### **Books & Articles**

- Eliminating Mercury in Hospitals: Environmental Best Practices for Health Care Facilities. [Washington, DC?]: U.S. Environmental Protection Agency, 2002. (Online at http://www.ciwmb.ca.gov/WPIE/HealthCare/EPAHgInHosp.pdf).
- Hylander, L.D. and M.E. Goodsite (2006). "Environmental Costs of Mercury Pollution." *Science of the Total Environment* 368(1), 352-370.
- *Lead, Cadmium and Mercury in Hospital Solid Waste: A Scoping Study.* Boston, MA : Northeast Waste Management Officials' Association, 1992. (Online at <u>http://www.p2pays.org/ref/19/18533.pdf</u>)
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- Williams, Guy O. Mercury Pollution Prevention in Healthcare: A Prescription for Success. Ann Arbor, Mich: National Wildlife Federation, Great Lakes Natural Resource Center, 1997. (Online at <u>http://www.newmoa.org/prevention/topichub/22/Mercury\_Pollution\_Prevention\_in\_Healthcare\_NWF.htm</u>)
- Zanoni, Pier-George. *Mercury Elimination/Pollution Prevention Strategies*. Healthcare facilities management series, no. 043133. Chicago, Ill: American Society for Healthcare Engineering of the American Hospital Association, 2000.

#### Web Sites

EPA New England Hospital Environmental Assessment Template http://www.epa.gov/region1/healthcare/pdfs/EPAHospitalTool.pdf

GLRPPR Sector Resources > Hospitals & Health Services > Mercury http://www.glrppr.org/contacts/gltopichub.cfm?sectorid=29#130

Healthcare Environmental Resource Center > Hazardous Materials http://www.hercenter.org/hazmat/hazoverview.cfm Healthcare Environmental Resource Center > Regulated Medical Waste http://www.hercenter.org/rmw/rmwoverview.cfm

Hospitals for a Healthy Environment > Hazardous Materials <u>http://cms.h2e-online.org/ee/hazmat/</u>

Hospitals for a Healthy Environment > Regulated Medical Waste <u>http://cms.h2e-online.org/ee/rmw/</u>

Medical Waste <u>http://www.epa.gov/epaoswer/other/medical/</u> U.S. EPA portal to resources about regulated medical waste, including sharps disposal.

Mercury – Health Care Topic Hub http://www.glrppr.org/hubs/toc.cfm?hub=502&subsec=7

Mercury – Thermometers Topic Hub http://www.glrppr.org/hubs/toc.cfm?hub=101&subsec=7

Mercury: Information for Health Care Providers http://www.epa.gov/hg/healthcare.htm

Mercury Elimination and Reduction Challenge <u>http://www.pollutionprobe.org/merc/merc.htm</u> Canadian mercury elimination effort.

### **Recycling & Waste Disposal**

#### **Books & Articles**

- *Cutting into Karapitiya Hospital's Solid Waste Problem*. Washington, DC : U.S. Agency for International Development, 200?. (Online at http://www.usaid.gov/lk/documents/tos/USAEP karapitiyahospital solidwaste.pdf)
- Dilly, G.A. and C.W. Shanklin (2000). "Solid Waste Management Practices in U.S. Army Medical Treatment Facilities." *Military Medicine* 165(4), 302-304.
- Donston, Debra (2007). "Hospital Finds Recycling Cure." *EWeek.com* October 13, 2007, no pagination. (Online at <u>http://www.eweek.com/article2/0,1895,2195693,00.asp</u>)
- Ferreira, A.P. and M.M. Veiga (2003). "Hospital Waste Operational Procedures: A Case Study in Brazil." *Waste Management Research* 21(4), 377-382.
- *Hospital Waste Management 101*. Lyme, NH: Hospitals for a Healthy Environment, 2007. (Online at <u>http://www.h2e-online.org/docs/summit2007datacollection.pdf</u>)
- Hildebrandt, C.C. and T.K. Boguksi (1993). "Life Cycle Analysis of Health-care Packaging and Materials." *Medical Waste Analysis* 2(2), 7-9.
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  "Developing a Master Plan for Hospital Solid Waste Management: A Case Study." Waste Management 27(5), 626-638.
- Laustsen, G. (2007). "Reduce -- Recycle -- Reuse: Guidelines for Promoting Perioperative Waste Management." *AORN Journal* 85(4), 717-722.
- Lee, B.K.; Ellenbecker, M.J.; Moure-Eraso, R. (2002). "Analyses of the Recycling Potential of Medical Plastic Wastes." *Waste Management* 22(5), 461-70.
- Rainbird, James (2003). "Waste Not, Want Not." HD 34(2), 37+.
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- Wahel, R.N. (2006). "Health Care Waste Management." Paper presented at the All India Seminar on Solid Waste Management in Urban Areas 10-11 February 2006, Mumbai. p. 18-19. (Online at <u>http://www.karmayog.com/images/swmuarea18.pdf</u>)
- *Waste Management 101 A "Brown" and "Green" Hospital Comparison*. Lyme, NH: Hospitals for a Healthy Environment, 200?. (Online at <u>http://www.h2e-online.org/docs/h2ewastemanagement101.pdf</u>)

- U.S. Environmental Protection Agency. *Fletcher Allen Health Care: Burlington, VT:* 90% Recovery of Preconsumer Food Discards. Washington, DC : U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response, 1998. (Online at http://www.epa.gov/epaoswer/non-hw/reduce/food/food2.pdf)
- Zanoni, P.G. (2003). "E-waste Elimination: Electronic Recycling Tips for the Health Care Industry." *Health Facilities Management* 16(8), 39-41.

Healthcare Environmental Resource Center > Waste Reduction – Landscaping and Food Waste http://www.hercenter.org/wastereduction/yardandfood.cfm

Hospital Recycling Program (Michigan DEQ) <u>http://www.deq.state.ms.us/MDEQ.nsf/page/Recycling\_HospitalRecyclingProgram?Ope\_nDocument</u>

Hospitals for a Healthy Environment > Recycling http://cms.h2e-online.org/ee/waste-reduction/recycling/

Hospitals for a Healthy Environment > Solid Waste Disposal http://cms.h2e-online.org/ee/waste-reduction/solid-waste-disposal/

Waste Reduction Activities for Hospitals <u>http://www.ciwmb.ca.gov/BIZWASTE/factsheets/hospital.htm</u>

## **Case Studies**

Best References: Hospital and Medical > Case Studies http://wrrc.p2pays.org/indsectinfo.asp?INDSECT=15#Case%20Studies

Boulder Community Foothills Hospital

http://www.cement.org/buildings/buildings\_green\_boulder.asp

Dedicated in September 2003, the \$53M Boulder Community Foothills Hospital became the first hospital in the nation to receive LEED certification from the U.S. Green Building Council.

Centre for Analysis and Dissemination of Demonstrated Energy Technologies (CADDET)

http://www.caddet.org/index.php

CADDET's objective was to enhance the exchange of information on new, cost-effective renewable energy and energy efficiency technologies. CADDET ceased collecting new information at the end of March 2005. Search using Hospitals to locate relevant case studies.

- *Cutting into Karapitiya Hospital's Solid Waste Problem*. Washington, DC : U.S. Agency for International Development, 200?. (Online at <a href="http://www.usaid.gov/lk/documents/tos/USAEP\_karapitiyahospital\_solidwaste.pdf">http://www.usaid.gov/lk/documents/tos/USAEP\_karapitiyahospital\_solidwaste.pdf</a>)
- U.S. Environmental Protection Agency. *Fletcher Allen Health Care: Burlington, VT:* 90% Recovery of Preconsumer Food Discards. Washington, DC : U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response, 1998. (Online at http://www.epa.gov/epaoswer/non-hw/reduce/food/food2.pdf)
- Gowande, S. (2006). "Hospital Solid Waste and its Management Approach- A Case Study of a Hospital in Akola District of Maharashtra." Paper presented at the All India Seminar on Solid Waste Management in Urban Areas 10-11 February 2006, Mumbai. p. 76-77. (Online at http://www.karmayog.com/images/swmuarea76.pdf)

Healthcare EnviroNet Case Studies

<u>http://www.c2p2online.com/main.php3?session=&section=88&doc\_id=174</u> Case studies that show what Canadian hospitals are doing to promote pollution prevention and sustainability.

- Hettenbach, Todd. *Greening Hospitals: An Analysis of Pollution Prevention in America's Top Hospitals*. Washington, DC: Health Care Without Harm, 1998.
- North Country Hospital Biomass Conversion And Cogeneration Project. Golden, CO: U.S. Department of Energy, Energy Efficiency and Renewable Energy, 2006. (Online at <u>http://www1.eere.energy.gov/biomass/pdfs/north\_country.pdf</u>)

Pollution Prevention Works for Iowa: Health Care Case Summaries. Des Moines, IA: Iowa Dept. of Natural Resources, 1996. (Online at <u>http://www.p2pays.org/ref%5C06/05843.pdf</u>)

The Nation's Greenest Hospital (Providence Health System, Newberg OR) <u>http://www.providence.org/yamhill/new\_medical\_center/green.htm</u>