

MD H2E



## Improving Patient, Worker, and Community Health: Examples from Maryland Hospitals

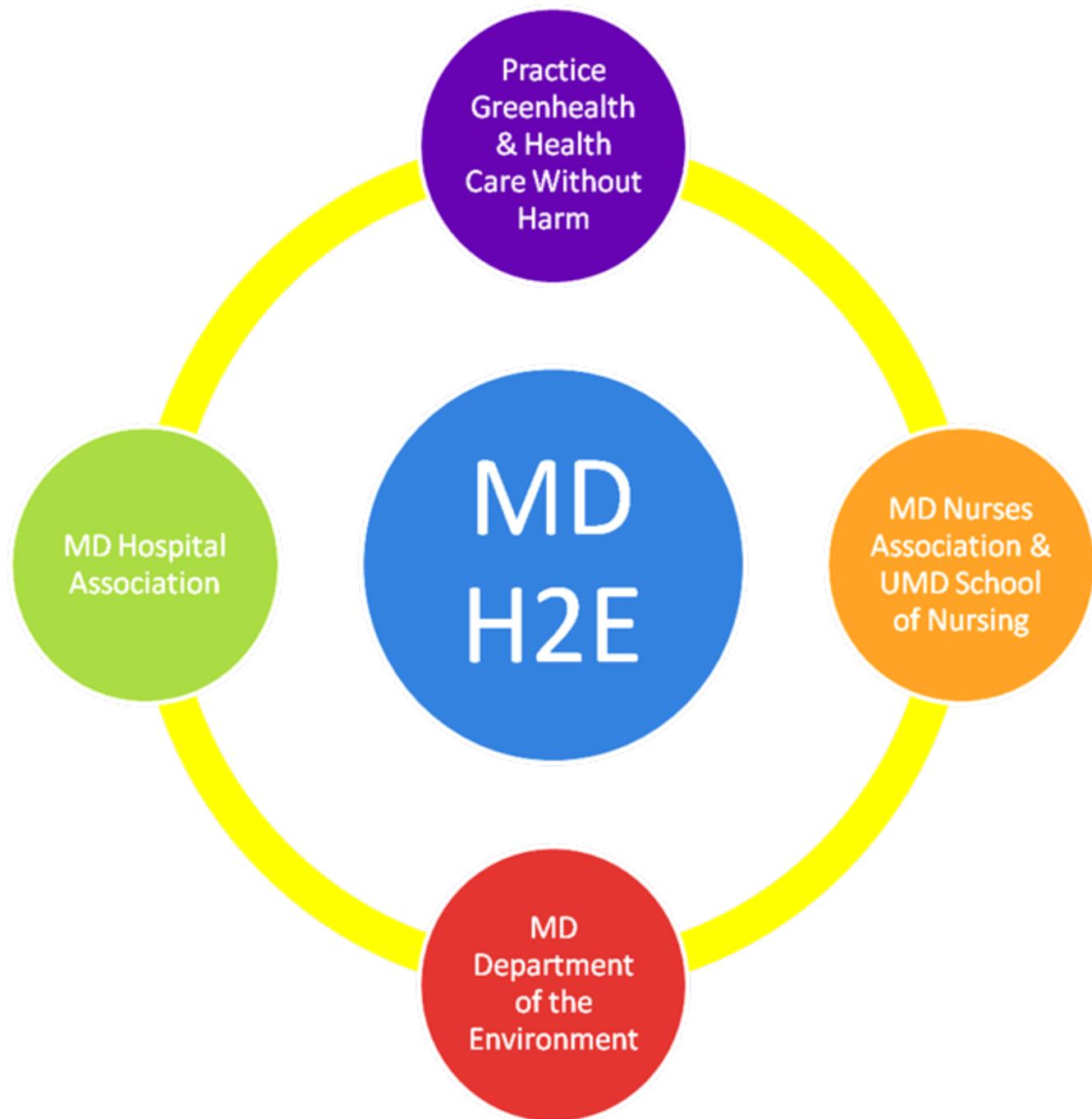
National Institute of Environmental Health Sciences  
(NIEHS)

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# MD H2E Activities

Pointing hospitals in the right direction!



- Collaborations
- Data Collection
- Vendor Connections
- Compliance
- Pilot Projects
- Focus Groups
- Networking

# Overlapping Regulatory Requirements

- State oversight of medical waste
  - Department of Health (DHMH)
  - Department of the Environment (MDE)
- Occupational Safety and Health Administration (OSHA)
- Department of Transportation (DOT)
- Joint Commission
- Nuclear Regulatory Commission (NRC)
- Drug Enforcement Administration (DEA)



# Some MD H2E Participants



Anne Arundel Medical Center  
Bon Secours Hospital  
Civista Medical Center  
Doctor's Community Hospital  
Franklin Square Hospital  
Center  
Good Samaritan Hospital  
Greater Baltimore Medical  
Center  
Harbor Hospital  
Harford Memorial Hospital  
Holy Cross Hospital  
The Johns Hopkins Hospital  
The Johns Hopkins Bayview  
Medical Center

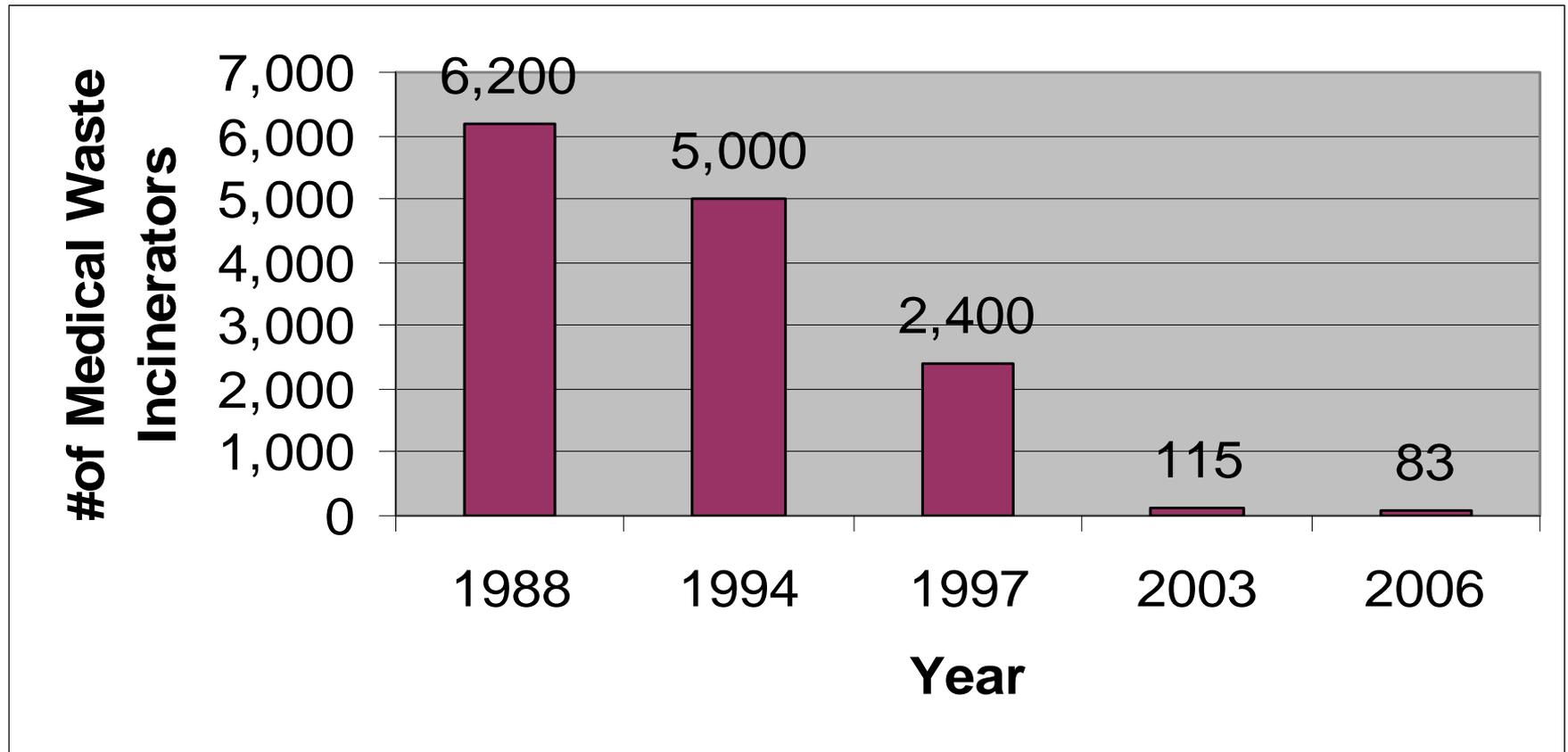
Kernan Hospital  
Kennedy Krieger Institute  
Mercy Medical Center  
Montgomery General Hospital  
National Naval Medical Center  
NIH Clinical Center  
Shady Grove Adventist Hospital  
Sinai Hospital of Baltimore  
St. Agnes Hospital  
St. Joseph Medical Center  
Suburban Hospital  
Union Memorial Hospital  
University of MD Medical Ctr  
Upper Chesapeake Health  
Washington Adventist Hospital

# Menu of Environmental Programs

- Pharmaceutical waste management
- Recycling
- Universal waste management
- Sustainable foods
- HIPAA/Confidential paper management
- Reusable sharps containers
- Solvent recovery
- Single-use device reprocessing
- Red bag waste minimization
- Mercury elimination
- Energy efficiency
- Environmentally preferable purchasing
- Glutaraldehyde/ EtO elimination
- Green cleaning/microfiber mops
- Green construction, renovation & design
- Integrated pest management
- PVC/DEHP elimination
- Water conservation



# Decline in Medical Waste Incinerators in the U.S.



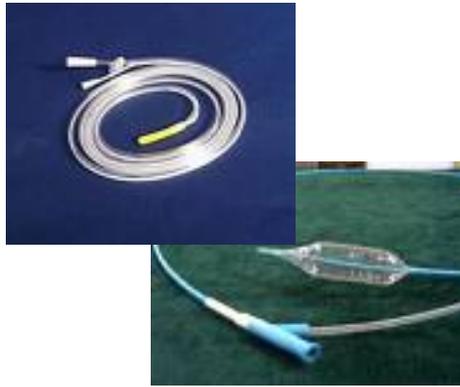
SOURCES: **1988**: “Hospital Waste Combustion Study-Data Gathering Phase,” USEPA, December 1998; **1994**: “Medical Waste Incinerators-Background Information for Proposed Standards and Guidelines: Industry Profile Report for New and Existing Facilities,” USEPA, July 1994; **1997**: 40 CFR 60 in the Federal Register, Vol. 62, No. 178, September 15, 1997, page 48350; **2003**: “Status of Current HMIWI Efforts,” presentation by Fred L. Porter, USEPA, at the Medical Waste Institute, June 2003; **2006**: USEPA medical waste incinerator inventory, February 17, 2006.

# Virtual Mercury Elimination

Dental



Clinical Devices



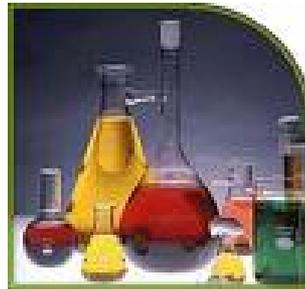
Electronics



Thermometers



Laboratory



Pharmaceuticals



Sphygmomanometers



Batteries

Thermostats



Fluorescent Lamps

# Polyvinyl Chloride (PVC) and Di-2-ethylhexyl phthalate (DEHP)

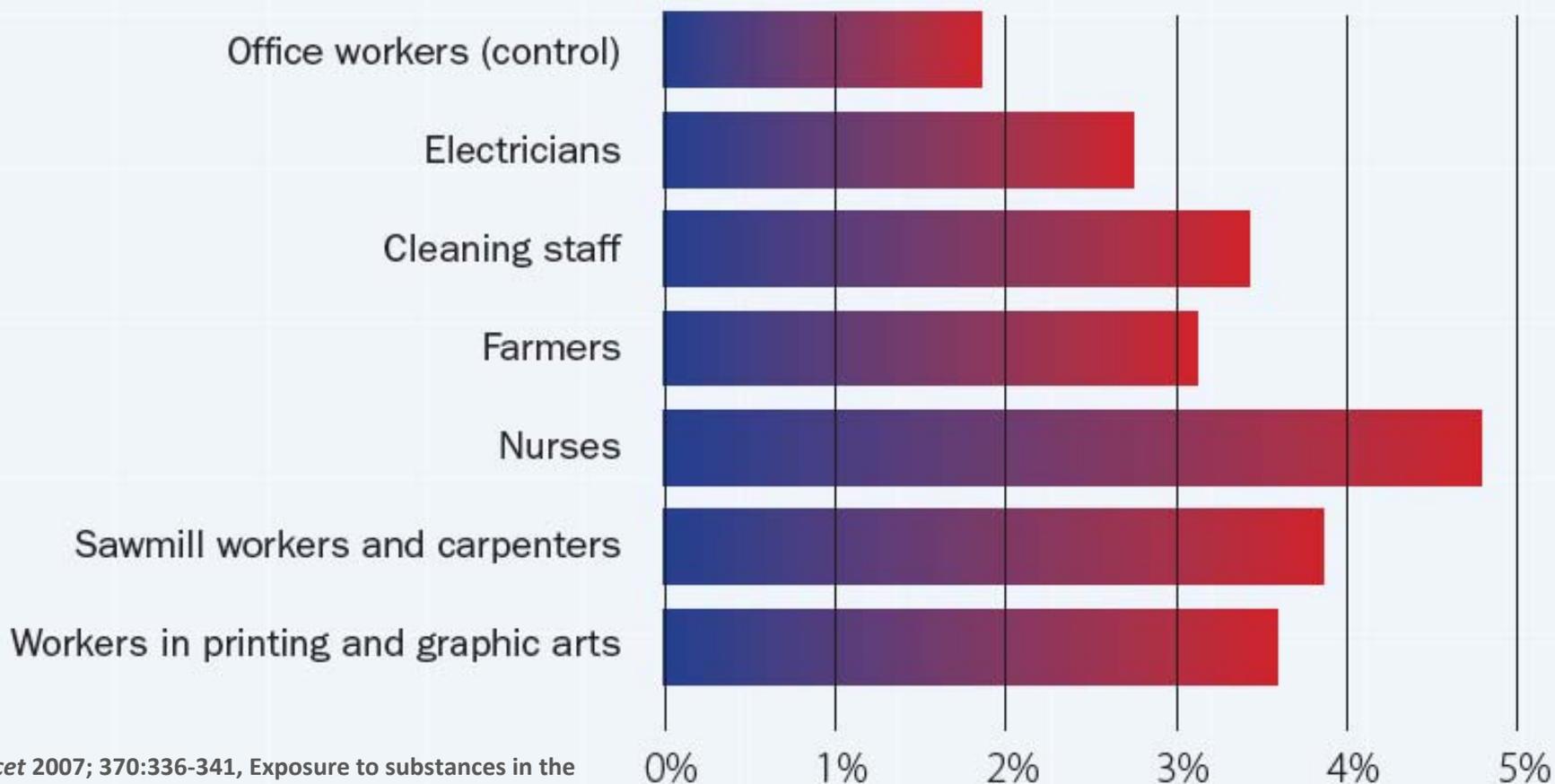
- When incinerated, PVC can contribute to dioxin formation—a human carcinogen.
- DEHP, a plasticizer, can leach out of contained fluids such as IV bags, enteral feeding devices and total parenteral nutrition (TPN) bags.
- National Toxicology Program, Center for the Evaluation of Risks Human Reproduction, Expert Panel found that DEHP is a reproductive and developmental toxicant in animal.
- US FDA Public Health Notification on DEHP in 2002
- MDE provided grant support to MD H2E for audits.



# Nurses Have Highest Rates of Work-Related Asthma\*



## ASTHMA CASES ACCORDING TO OCCUPATION<sup>3</sup>



\**The Lancet* 2007; 370:336-341, Exposure to substances in the workplace and new-onset asthma: an international prospective population-based study



# Nurses' Exposure Survey\*

- Disinfecting & sterilizing chemicals
- Medications: antiviral & chemotherapy
- Radiation
- Anesthetic gases
- Latex
- Cleaning chemicals

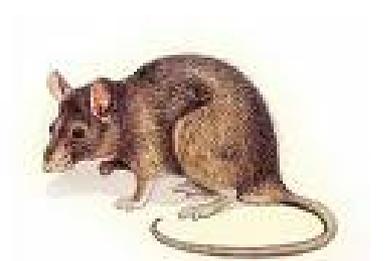
- Survey of over 1500 nurses on health and chemical exposures.
- Assessed the relationship between nurses' health and exposures to 11 common health care hazards.
- Nurses with frequent, long-term exposures to chemotherapeutic medications reported **42%** higher rates of cancer.
- Nurses exposed to anesthetic gases during pregnancy reported rates of certain birth defects in their children up to **7 times** higher than among children born to nurses not exposed during pregnancy.

# Green Cleaning

- Greener, less toxic cleaning chemicals
- Relationship to infection control-  
cleaning THEN disinfecting where  
necessary
- Safer cleaning equipment that  
reduces impact on patients and  
staff
- Environmentally friendly bathroom  
paper products



# Integrated Pest Management (IPM)



- Pesticides are designed to kill pests; hospitals are designed to heal people
- IPM uses effective, least toxic methods of pest control
- Think about what's attracting or 'supporting' pest infestations: food, moisture, shelter
- IPM Pilot Program in collaboration with the Maryland Pesticide Network

# Pharmaceutical Waste Management

- Do not flush any medications down the drain (unless required by law or regulation)
- Make full use of reverse-distributors
- Understand which medications are considered hazardous under RCRA
- Develop comprehensive hazardous waste management plan



Source: Chemical & Engineering. News, February 25, 2008, Pharmaceutical Pollution



# GREEN BUILDING



Factors such as increased daylighting, more environmentally friendly wall and floor coverings, healing gardens, green roofs, break rooms with natural light have been associated with:

- Improved patient outcomes
- Fewer medication errors
- Decreased pain medication for some patients
- Shorter patient stays/quicker recovery times
- Increased staff retention
- Improved env. operations programs



[www.gghc.org](http://www.gghc.org)



# Regulated Medical Waste

- Biohazardous, infectious, red bag waste
- 4-6x more costly to dispose of RMW than regular trash
- MDE and DHMH regulatory issues
- Reduction and segregation strategies
- Reusable sharps container program, operating room waste, single-use device reprocessing, liquid waste management
- Treatment technologies



# Thank-You!

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[www.h2e-online.org](http://www.h2e-online.org)

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