

The

Mercury Challenge

Handbook

*The Opportunity to Become
a Mercury-Free Facility*

May 2001



Ohio Hospital Association



State of Ohio Environmental Protection Agency

**PART OF THE OHIO HEALTHY HOSPITAL
POLLUTION PREVENTION INITIATIVE**

THE MERCURY CHALLENGE

Acknowledgments

We would like to thank U.S. EPA Region 1 for providing the template for this program; the Minnesota Office of Environmental Assistance publication, "Mercury Use in Hospitals and Clinics;" The American Society for Healthcare Environmental Services publication, "Becoming a Mercury Free Facility;" and the Nightingale Institute for Health and the Environment for their fact sheet on mercury.

Welcome

Welcome to **The Mercury Challenge**, a joint program of the Ohio Hospital Association and its member hospitals and the Ohio Environmental Protection Agency (Ohio EPA) Office of Pollution Prevention (OPP). This partnership is creating programs to help Ohio medical facilities be national leaders in eliminating mercury and/or mercury-containing waste by 2005. The program is voluntary and flexible to allow facilities to design their own approach and demonstrate measurable reductions of mercury in their facility.

Ohio Healthy Hospitals Pollution Prevention Initiative

OPP is working with the Ohio Hospital Association and its member hospitals, U.S. EPA Region 5, and the American Hospital Association on a program to reduce hospital waste in Ohio. A memorandum of understanding between the Ohio EPA and the Ohio Hospital Association was signed during National Pollution Prevention Week in September 1999, which identified a series of joint activities to reduce mercury and other types of waste in Ohio hospitals. These activities are known as the *Ohio Healthy Hospitals Pollution Prevention Initiative*, and The Mercury Challenge is a key part of this initiative.

May 2001

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This form must be completed and submitted with the documentation specified by the enrollment date for you to qualify.

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These checklists and information tools are designed to assist you with developing your program, educating your staff and documenting your effort. You can copy them directly or request them in electronic form to modify to meet your specific program.

FORMS AND CHECKLIST PAGES

A1 - Conducting a Baseline Inventory of Mercury Containing Devices and Substances **17**

Most hospitals do not have a clear inventory of all the mercury-containing devices and products in use at their facility. This form is designed to assist in an initial inventory to be conducted as a baseline information source upon which your program will be built. The results should be submitted as part of your application.

A2 - Checklist of Mercury Sources to Consider in a Baseline Inventory **18**

This checklist is designed to gather information on policy and operations in regard to mercury use, purchasing and disposal issues. It will supplement the inventory and the results should also be included in your application.

A3 - The Action Plan for Mercury Elimination by 2005 **21**

The action plan (and the attached example) provides an outline of the type of organizational approach which your facility will need to develop in order to qualify for the “Mercury Challenge.” It provides a template of your plan, which must be submitted as part of your application.

ATSDR Mercury Fact Sheet for Staff and Public Education **24**

The Agency for Toxic Substances and Disease Registry provides fact sheets on a number of hazardous substances. This sheet on mercury is provided to be used in your efforts to educate your staff about the critical nature of your work to reduce mercury.

THE MERCURY CHALLENGE PROGRAM OVERVIEW

Consider this handbook your helpful partner as you take steps to strengthen the environmental health of Ohio by reducing mercury. We think you will find that taking steps to protect the environment can be both economically feasible and good for your facility. Show your customers, peers and the community that you can “do good and do well.” This is your environmental handbook for reducing mercury pollution. In it you will find:

Information about how to participate in the Mercury Challenge including:

- * How to register with the program
- * How to develop you own program
- * Having a mercury goal and keeping that goal current
- * How to track your progress
- * Making sure your facility is in good compliance status

Examples of things you can do to reduce and/or eliminate mercury from your facility.

Resources to provide you with more information about environmental practices.

WHY MERCURY?

Mercury has long been known to have harmful effects on humans and wildlife. Mercury, a heavy metal, is a toxic, persistent, bioaccumulative pollutant. The adverse health effects caused by mercury impact the neurologic and renal systems. Mercury can harm the developing fetus as well as young children whose neurological systems are still developing. Fish consumption by pregnant women or direct consumption of fish by young children is the primary pathway of exposure. There are also general populations of citizens at risk who eat large amounts of contaminated fish from local waters because of economic or cultural reasons. Mercury contamination is the most frequent reason for fish advisories, represented in 60 percent of all water bodies with advisories. The Ohio Department of Health issues fish consumption advisories. Forty states (including Ohio) have advisories for mercury in one or more water bodies, and nine states have issued statewide mercury advisories. The list of waterbodies with more restrictive mercury advisories and general fish consumption advisories is available from the Ohio Department of Health.

WHY TAKE THE MERCURY CHALLENGE?

Reducing mercury pollution in a healthcare setting has many advantages including:

- 1) Protection of human health by reducing occupational exposures and releases of mercury to the air, water and land from wastewater discharges, spills, land filling or incineration
- 2) Avoidance of the costs associated with the use of mercury, such as disposal or recycling, collection and storage prior to disposal, paperwork for tracking hazardous waste disposal, training and equipment for spill response, training for hospital employees who handle mercury-containing products and liability for environmental problems or worker exposure
- 3) Avoidance of increased regulation in the future
- 4) Opportunities to increase the public's awareness about the dangers of mercury through publicity about the hospital's program
- 5) Enhancement of the positive public image of the medical facility due to publicity about success stories
- 6) Mercury is a listed hazardous waste under RCRA (CFR 260, Hg U-151), and must be managed as a hazardous waste (RCRA information available at: <http://www.epa.gov/epaoswer/hotline/rmods.htm>).

WHAT IS THE MERCURY CHALLENGE?

Mercury is a concern not only in Ohio but across the nation. U.S. EPA and the American Hospital Association (AHA) signed a Memorandum of Understanding (MOU) in June 1998 with several voluntary goals including the virtual elimination of mercury-containing waste from the healthcare industry waste stream by 2005. Ohio EPA and the Ohio Hospital Association also signed a Memorandum of Understanding (MOU) in 1999 with several voluntary goals including mercury reduction from Ohio hospitals.

Ohio EPA and the Ohio Hospital Association have initiated a joint effort to work with healthcare institutions in Ohio on reducing mercury and addressing other environmental issues. It is a way for Ohio medical facilities to discover and implement responsible environmental practices for mercury, and to receive community recognition for those good efforts.

Ohio EPA and the Ohio Hospital Association will help you reduce or eliminate mercury by providing resources, information, support and encouragement. The Mercury Challenge ensures that medical facilities that achieve their goals will be recognized in their community for their efforts.

The Mercury Challenge is open to any hospital in Ohio. Facilities design their own specified reduction goals and agree to make good faith voluntary effort to identify and implement prevention measures.

TO BECOME RECOGNIZED AS A MERCURY CHALLENGE PARTICIPANT

Follow these simple steps:

1. Conduct a Baseline Inventory

Each facility should examine its operations to identify all sources of mercury in use, in storage or being purchased, including mercury found in equipment, instruments, and products. This inventory will help identify the location, number and type of mercury-containing devices and products within your facility. A list of typical mercury sources in a healthcare setting and information about mercury sources can be provided along with things that you may want to consider when doing a baseline inventory. This inventory will serve as the baseline for the program. Conducting an inventory may take several hours or several days depending on the size and complexity of the facility. (*See form A1 'Conducting a Baseline Inventory of Mercury Containing Devices and Substances' on page 17 and form A2 'Checklist of Mercury Sources to Consider in a Baseline Inventory' on page 18*)

2. Set Mercury Reduction Goals

As part of the voluntary effort, each facility should develop and submit to Ohio EPA its own quantifiable mercury goal, which can be part of your overall environmental goals. The mercury goal should be practical and measurable based on your specific needs as identified by your inventory. Your mercury goal could be expressed in reduction of the overall amount of mercury used or present in your facility compared to baseline inventory results. In the establishment of your mercury goal you may want to consider evaluating the economic impact of the presence of mercury against the cost and impacts of mercury-free alternatives. The mercury goal should be communicated to all employees. For example, the goal may be stated as eliminating all sources of mercury pollution by product substitution (e.g., thermometers and sphygmomanometers) or waste minimization/recycling (e.g., batteries, fluorescent bulbs). The documentation of much of this will be based on purchasing records and your tracking system. To set goals it is important to consider your baseline starting point. *(See Sample Tracking form on page five)*

3. Develop an Action Plan

Each facility should develop an action plan outlining your reduction goal for mercury, the steps you plan to take to achieve the mercury goals and time frames for achieving them. This can be a simple, one page outline. *(See form A3 'The Action Plan for Mercury Elimination by 2005' on page 21)*

4. Commit to Tracking your Progress

The facility should track the measurable progress made that year towards achieving the mercury reduction goal and then submit a summary of accomplishments to Ohio EPA. Some examples include: 1) if you eliminated mercury thermometers, track how many have been replaced with non-mercury substitutes, 2) if you have started to phase out the use of mercury sphygmomanometers, track how many you replaced, or 3) if you started a recycling program for fluorescent lights, track how many bulbs you recycled that year. You will need to demonstrate a reduction in mercury against your baseline inventory to receive recognition from the program in future years.

Sample Tracking Form

Unit X baseline inventory: (September 2000)

- Hg fever thermometers = 300
- Hg sphygmomanometers = 35

Goal for Unit X: (By December 2001)

- Hg thermometers reduced by 50%
- Hg sphygmomanometers reduced by 50%

(By December 2002)

- Hg thermometers reduced by 90%
- Hg sphygmomanometers eliminated entirely

5. Register for the program

Fill out the Mercury Challenge Program Registration on page 14 of this handbook and send it to the Ohio EPA Office of Pollution Prevention stating what you did and how the activity met the Mercury Challenge requirements. Document the positive results.

In your registration, tell us about efforts you have taken during the calendar year in which you apply. For consideration in the Mercury Challenge please have your applications in by **November 30th** of the current year. Applications may be turned in anytime before **November 30th**. Applications turned in after **November 30th** will be considered for the following year's program. Once the application is approved you will receive notification in the mail. The approval process will take approximately sixty days.

As soon as Ohio EPA confirms that the activities outlined in your registration form and materials meet the program requirements (following the steps listed above, filling out the registration form and making sure your facility is in good compliance standing), you will be recognized as a participant in the Mercury Challenge.

If your organization includes more than one facility, submit a registration form for each facility.

6. Continuation in future years

To continue your participant status for the Mercury Challenge in future years, you must demonstrate continued commitment by taking on additional actions that build upon your past progress. You will need to maintain your program, revise your commitment and document continuing reduction in mercury at your facility against your baseline inventory.

For more information about the program contact:

Ellen Miller at 614-644-3469 (e-mail at: ellen.miller@epa.state.oh.us)
Ohio EPA Office of Pollution Prevention

HINTS FOR DEVELOPING YOUR OWN MERCURY REDUCTION PROGRAM

This section provides you with examples of the general types of activities you can do and programs you can implement to promote mercury reductions through pollution prevention. Pollution prevention includes the use of materials, processes or practices that reduce or eliminate the use of mercury or generation of mercury waste.

Develop a Team

Mercury can be found in many different areas of your facility. It will take a team effort to reduce and eventually eliminate its use. Identify key players at your facility: doctors, nurses, engineers, safety officers, purchasers, and housekeeping and maintenance personnel. Engage the team to spearhead your program.

Training and Communication

Develop a broad-based communications program throughout your facility to increase the general level of awareness about problems associated with the use of mercury. Provide education to all personnel, and give ways to prevent mercury pollution. Give the responsibility for your program to an identified person or committee that can act as a central point of contact for all departments. Develop information to target hospital employees including what they can do both at home and at work. Involve your employees and whole community in a voluntary “turn-in” program for thermometers and batteries.

Good Housekeeping and Management

Publish and make available to all units a distinct protocol to prevent mercury from being disposed of in sharps containers, with infectious waste or in the general waste stream (general trash or in floor drains, sinks, etc). Make sure that all staff understand the importance of a mercury “spill” (including a broken thermometer) and the procedure for clean up and disposal.

Proper Handling and Disposal of Mercury Products

Clearly label equipment that contains mercury. Establish adequate disposal routes and operating guidelines for mercury recovery and cleanup. Mercury is a hazardous material and becomes a hazardous waste when spilled or when a device is disposed of. When hazardous waste regulations come into play contact your Ohio EPA district office to speak to someone in the Division of Hazardous Waste Management for regulation information. When remodeling or replacing old equipment, properly dispose of any mercury devices and replace with a non-mercury device when feasible. Develop and follow procedures for cleaning and refilling instruments that contain mercury. Bowling Green State University manages a free Ohio mercury reclamation program. Contact Dave Heinlen at 419-372-2173 or visit the Web page at <http://www.bgsu.edu/offices/envhs/mercury.htm>.

Selecting Alternative Mercury Free Products

Encourage your facility to buy products that do not contain mercury. Authorize the purchasing department to seek out mercury-free alternatives (See The Sustainable Hospitals Project at <http://www.sustainablehospitals.org>), and to insist on mercury (as an ingredient) disclosure on all products currently coming into the facility. Create a plan to phase out mercury-containing medical products and equipment such as mercury thermometers, blood pressure monitors (sphygmomanometers), diffusion pumps, mercury oxide batteries, esophageal dilators, Cantor tubes and Miller Abbott tubes (used to clear intestinal obstructions), as well as histology fixatives and stains. Purchase non-mercury cleaners and degreasers in labs, housekeeping and maintenance. In evaluating your options, remember to consider the total cost of the product including disposal costs and costs that result from cleaning up spills.

Recycling

In managing current mercury containing devices at your facility, recycling the mercury to eliminate it from the waste stream is another alternative. An example of when recycling makes sense is for fluorescent lights. You may also want to consider a battery collection program or a collection program of other mercury-containing products used at your facilities. See the Ohio EPA Office of Pollution Prevention Web page for additional recycling information on mercury and fluorescent lamps at <http://www.epa.state.oh.us/opp/wastex.html>.

Practices

Explore hospital practices that may unintentionally promote the use or distribution of mercury. These could include distributing mercury thermometers to the parents of newborns and other patients in their “take-home” package. Consider a non-mercury device instead. You might also find policies that specify the use of mercury units to calibrate electronic blood pressure devices. Also check the hospital gift shop as a possible source of mercury. Products such as greeting cards or toys can contain mercury switches or mercury batteries. See form A1 on page 17 and form A2 on page 18 for lists of uses and practices.

Audit Your Program

Keep a current inventory of mercury-containing products and equipment. Keep a quantitative record of mercury. Know how much mercury is in use or stored on the premises, and how much has been spilled, recovered, or discarded. Identify mercury-containing materials and equipment, their arrival in the facility, the history of their use, and final destination. Identify other in-facility sources of potential mercury contamination.

Mentoring

Share your experiences with other hospitals through the development of case studies, assisting another hospital directly to evaluate and set up its program, and/or circulating example procedures for recycling, spill prevention, purchasing, inventory control, training or other useful materials. Ohio EPA and the Ohio Hospital Association will create a list of facilities you can contact at a later date as part of the Mercury Challenge program.

HOW DO I MEASURE SUCCESS?

Measurement is a key element of the program so it is important that you measure the success of the activities you undertake.

Approaches to developing an inventory

There are two basic approaches: look at what is coming into the healthcare facility with orders of supplies, shipments, patients, etc. (“supply side” approach) or look at what is going out in the waste streams (“waste stream” approach).

1. The Supply Side

The advantage of looking at what is coming in is that more detailed records might be available for procurement than for discards of unwanted materials. The supply side to the hospital is also directly linked with the purchasing behavior that healthcare facilities should examine and change. If a facility is able to reduce or eliminate the purchase of certain mercury-containing equipment or products (e.g. thermometers, sphygmomanometers, dilators), the facility could report the number and type of alternative equipment or products purchased. Ask your purchasing department to run usage reports on mercury items you have identified.

2. The Waste Stream

The waste stream approach requires more “detective work” to trace mercury in waste streams back to the actual source of mercury in the healthcare facility. It relies on staff being trained to recognize and report mercury spills, or to know what materials contain mercury so they can be properly disposed of. This approach requires information on both the concentration of mercury in the waste stream and the quantity of waste generated.

A combination of both approaches is useful to fill information gaps.

Information needed to qualify or quantify mercury use

Mercury use primarily centers around products and equipment. A list of products and supplies containing mercury is helpful to create an inventory checklist for the facility. (See Form A2 for a sample, and refer to the Sustainable Hospitals Project at <http://www.sustainablehospitals.org> for more information).

The hospital purchasing manager can be asked to identify products on the list that the hospital uses and provide reports tracking the volume of goods purchased and the amount used by each department. Another list of hospital equipment and appliances that contain mercury can be compiled to address issues related to equipment use. Issues to explore might include how unwanted equipment is disposed of and whether mercury is removed from equipment prior to disposal by hospital personnel, service contractors or the vendor.

For the equipment and supplies that contain mercury and are used by the hospital, the facility can contact the manufacturer, vendors or suppliers through the purchasing office to determine the amount of mercury in the product. They can then multiply by the number of each product used to come up with an estimate for the amount of mercury at the facility.

SAMPLE

A	B	C	D	E	F
Item	Amount of Hg in each unit	Number of units purchased each year	Number of units still in use at end of year	Number of units accounted or unaccounted for in disposal	Mercury disposed of or released unintentionally (BxC)-(DxB) = F

THE REWARD

If your activities demonstrate a commitment to and progress towards environmental improvement, these are the benefits you will receive as a Mercury Challenge Participant:

1. A certificate of recognition
2. Inclusion in the Mercury Challenge participant directory so you can network with other like-minded institutions
3. Inclusion in Ohio EPA and OHA press releases to regional newspapers, trade journals and other publications
4. The right to market yourself as a Participant in the Mercury Challenge in your advertising and marketing materials

Join us as a participant in the Mercury Challenge. Let's work together and show others by example that everyone can make a difference.

RESOURCES

This section provides you with ways to communicate with environmental agencies and groups should you have questions or need information, as well as resources that are available to assist you in reducing or eliminating mercury or other waste.

Resources: Publications (Books, Reports, Educational Materials)

Becoming a Mercury Free Facility: A Priority to be Achieved by the Year 2000 by Hollie Shaner. (1997 Professional Development Series of the American Society for Healthcare Environmental Services.) To order, contact the Environmental Services of the American Hospital Association, One North Franklin, Chicago, IL 60606, phone 800-242-2626, fax 312-422-4505. Cost \$25.

The Case Against Mercury: Rx for Pollution Prevention (1995 Terrene Institute, in cooperation with the U.S. Environmental Protection Agency Region 5, Chicago, IL). This brochure introduces readers to the dangers of mercury in the environment, alternatives for mercury in a healthcare setting, and proper management of used mercury or mercury spills. A large display poster is also available. Contact the Terrene Institute at 800-726-4853. Cost \$5.

Mercury Use in Hospitals & Clinics by the Minnesota Office of Environmental Assistance. This handout is excerpted from the Wisconsin Mercury Source Book and adapted for Minnesota hospitals and clinics. Includes information on mercury-containing products unique to hospitals and clinics, case studies and action ideas for pollution prevention, and recycling and management practices for a hospital or clinic. A good overview of the types of mercury-containing products and alternatives that may exist in hospitals and clinics is also provided. There is also a 17 minute video suitable for staff education entitled *Mercury and the Healthcare Professional*. Contact the Minnesota Office of Environmental Assistance at 520 Lafayette Rd., 2nd Floor, St. Paul, MN 55155-3898, phone 612-296-3417 or 800-657-3843.

Mercury in the Healthcare Sector: The Cost of Alternative Products report compares the cost of mercury containing equipment and products with non-mercury alternatives at hospitals. Contact Pollution Probe at 416-926-1907. Cost \$17.

Mercury Pollution Prevention in Healthcare: A Prescription for Success (1997 National Wildlife Federation). Available from the National Wildlife Federation, Great Lakes Natural Resource Center, phone 734-769-3351 or download from the web at <http://www.nwf.org/greatlakes/resources/mercury.html>. This booklet has a good background on the mercury problem and a list of resources. Cost \$6.

Keeping Mercury Out of Medical Waste, Use of Alternative Products, and Keep Mercury Out of the Waste Water Stream. U.S. EPA Region 5, Medical Waste Pollution Prevention Fact Sheets. Call Chris Urban, U.S. EPA, at 312-886-3493.

Our Waste, Our Responsibility is a twenty minute video produced by the University of Vermont designed to increase awareness of the problematic nature of waste management in the healthcare industry, and propose solutions that illustrate a pollution prevention approach to that problem. This video was sent to each Ohio Hospital Association member hospital. For additional copies of the video call 800-639-3188 or visit the University of Vermont Web site at <http://www.uvm.edu> (run a search on 'healthcare' and you will see the video listed).

Resources: Web Sites

<http://www.epa.state.oh.us/opp/hospital.html> Web site developed by the Ohio Environmental Protection Agency specific to pollution prevention efforts at hospitals. You will find links to the following sites and other information of note.

<http://www.epa.gov/seahome/mercury/src/title.htm> Web site and software developed by Purdue University and U.S. EPA entitled Mercury Use Reduction and Waste Prevention in Medical Facilities. This software is designed to assist medical professionals reduce the use of mercury in hospitals.

<http://www.sustainablehospitals.org> The Sustainable Hospitals Project provides healthcare personnel with tools, training, and technical support to improve the environmental practices of hospitals. The Sustainable Hospitals Clearinghouse provides timely, accurate and useful information about alternative products that do not contain mercury, polyvinyl chloride (PVC) and other potentially harmful materials.

<http://www.ewg.org/pub/home/reports/greening/greenpr.html> Executive summary for Greening Hospitals, Greening Hospital report and survey results.

http://www.uvm.edu/~dceweb/profprog/order/healthcare_impact_environment.html
Provides information about a 1998 University of Vermont teleconference, The Health Care Industry's Impact on the Environment: Strategies for Global Change. Speaker slides, video ordering information and background information are all included.

<http://www.deq.state.mi.us/ead/p2sect/mercury> Michigan's mercury pollution prevention home page includes a link to healthcare products known to contain mercury and mercury alternatives and information about companies that process or recover mercury.

<http://www.bgsu.edu/offices/envhs/mercury.htm> This program put on by Bowling Green State University and Ohio EPA involves the collection of uncontaminated elemental mercury from a variety of sources. The program is available and FREE to individuals, academic institutions, small businesses, industries, medical and dental facilities, emergency response and other governmental agencies, spill response companies, and any additional entity having unwanted, uncontaminated elemental mercury.

<http://www.ohanet.org/> The Ohio Hospital Association.

<http://www.aha.org/default.asp> The American Hospital Association.

<http://www.noharm.org/> Health Care Without Harm is a collaborative campaign for environmentally responsible healthcare.

Resources: Alternatives

Some Sources of Mercury in Healthcare Facilities & Alternative Products	
<i>PRODUCT</i>	<i>POSSIBLE ALTERNATIVES</i>
Batteries used in medical equipment such as defibrillators, hearing aids, pacemakers. Note: every pump, flashlight & beeper has a battery back up. Not all contain mercury but many do.	Lithium, zinc air, or alkaline batteries
Dental amalgams that are discarded	gold, ceramics, porcelain, and polymers
Esophageal devices including Cantor tubes, Miller Abbott tubes and esophageal bougies	similar devices but with tungsten tubing (tungsten for weight)
Sphygmomanometers (mercury-containing blood pressure monitoring devices)	electronic vacuum gauge, expansion or aneroid technologies
Thermometers to monitor patient temperature	electronic (digital), expansion or aneroid
Lamps, lighting fixture bulbs such as fluorescent, high intensity, ultraviolet or others	ordinary glow lights, low sodium vapor tubes, opticals, high energy, long lasting bulbs
<i>CHEMICAL</i>	<i>POSSIBLE ALTERNATIVES</i>
Mercury chloride Zenkers solution Histological fixatives	Zinc formalin freeze drying
Staining solutions and preservatives Thimersol, Immu-sal, Carbol-fuchin stain, Gram iodine stain, phenoic mercuric, acetate, alum, Hematoxylin "solution A"	Can replace with a variety of chemical compounds now readily available on the marketplace. Some substitutes, such as copper and chromium compounds also have some risk, but less than the risk associated with mercury

The University of Massachusetts - Lowell's Sustainable Hospital Project maintains a Web resource page at the following URL which provides regularly updated information on alternatives to these and other products including direct links to manufacturers.

<http://www.sustainablehospitals.org>

The Mercury Challenge Program Registration

Return registration materials by **November 30th** of the current year

1. Name _____ Title _____

Name of Facility _____

Address _____

Phone _____ Fax _____

Email _____

2. Date of Application: _____

3. How did you hear about this program?

4. Describe the type and size of your facility (including number of employees, beds, occupancy rate).

5. Have you performed a baseline inventory of mercury use in your hospital?
____ Yes Date of inventory _____ ____ No, we need more guidance

Attach a copy of your inventory report (See Form A2: Checklist sample on page 18)

6. Attach a copy of your facility's mercury reduction goals (see page 4 of The Mercury Challenge handbook, step 2) in terms of reductions from the baseline inventory.
- 7 List specific steps you have taken toward mercury reduction if this is a continuing initiative
- 7 List the specific steps you are committed to taking toward mercury reduction in the coming year
- 7 Does your facility have a stated organizational commitment to becoming "mercury free?" If so, please attach a copy.
- 7 How have you communicated these goals to your employees? Explain.

7. Do you have a specific mercury reduction action plan with measurable goals?
 No Yes - Please attach a plan overview.

8. If you have achieved mercury reductions from activities prior to current year, please describe and quantify specific achievements (e.g., reduced the number of mercury fever thermometers from 5000 per year to 300 per year). How much of your mercury goal had been accomplished prior to the year you joined the Mercury Challenge Program?

Mail Registrations to: Mercury Challenge Program
 Ellen Miller
 Ohio Environmental Protection Agency
 Office of Pollution Prevention
 P.O. Box 1049, 122 S. Front Street
 Columbus, OH 43216-1049

You can also fax registrations to: 614-644-2807

For consideration in the Mercury Challenge please have your applications in by **November 30th** of the current year. Applications may be turned in anytime before **November 30th**. Applications turned in after **November 30th** will be considered for the following year's program. Once the application is approved you will receive notification in the mail. The approval process will take approximately sixty days.

FORMS AND CHECKLISTS

The following checklists and information tools are designed to assist you with developing your program, educating your staff and documenting your effort. You can copy them directly or request them in electronic form to modify to meet your specific program.

CONDUCTING A BASELINE INVENTORY OF MERCURY CONTAINING DEVICES AND SUBSTANCES

The goal in conducting an inventory is to get a true sense of how much mercury is still present within your facility. Some healthcare organizations are fairly confident that they are mercury-free since they adopted digital technologies to measure body temperature and blood pressure. The evolution of cost-effective digital technologies has facilitated the elimination of many mercury products and devices from commonplace use. However, many mercury containing products and devices may still be present in your organization or in area satellite facilities.

One of the most effective ways to "ground-truth" or check your organization's current use of mercury containing products and devices is to schedule a walk-through assessment. Go to each area and observe for mercury-containing products and devices. Converse with staff and inquire if they know of any mercury-containing products or devices in their work areas. Be sure and check every department. Record information collected on a data collection sheet (see below)

Mercury Inventory

Date:

Area	# of Sphygmomanometers Brand name: Note: "C" if area is carpeted	# of thermometers Brand name" Note: "C" if area is carpeted	Other devices / substances: list type and how many

Areas to pay special attention to:

- Doctors offices/exam rooms
- Central sterile reprocessing
- Nursery, neonatal intensive care
- Intensive care units
- Emergency departments
- Hospital gift shops
- Hospital based pharmacies (inpatient and outpatient)
- Public relations (some hospitals give away first aid kits that contain mercury thermometers)
- Laboratory areas; check laboratory refrigerators and incubators for thermometers
- Kitchen: check refrigerators, food warming units
- Facilities support shops - electric shop, biomedical engineering
- Patient care rooms
- Diagnostic areas such as cardiology, cardiac catheterization, MRI, CT
- Check patient admission kits for mercury thermometers

CHECKLIST OF MERCURY SOURCES TO CONSIDER IN A BASELINE INVENTORY

The following checklist is a resource that can be used to evaluate your mercury baseline. This form should serve as a guide for the type of information that you may want to collect in a baseline inventory of your facility.

Mercury policies and practices: Does your facility

- Have a policy regarding the purchase of mercury-containing products? - Yes - No
- Centrally track or have an inventory form for mercury products? - Yes - No
- Have a policy on how to clean up a mercury spill? - Yes - No
- Have procedures for cleaning and refilling instruments with mercury? - Yes - No
- Label the equipment as containing mercury? - Yes - No
- Phase out mercury parts when replacing equipment? (E.g., thermometers) - Yes - No
- Recycle mercury parts when you replace old equipment? (E.g., switches) - Yes - No
- Require the manufacturer/vendor to disclose mercury concentrations? - Yes - No
- Have a policy to ensure mercury products are not disposed of down the drain? - Yes - No
- Have a protocol for disposal of intact mercury-containing products? - Yes - No

- Train employees on mercury awareness? - Yes - No
- Train employees how to properly clean up a mercury spill? - Yes - No

- Clean mercury out of traps, sumps and pipes in your sewer lines? - Yes - No

- Send new mothers or patients home with mercury thermometers? - Yes - No
 If so, how many are issued each year? _____

Mercury Equipment: Does your facility or its satellites use/purchase:

- Mercury thermometers? - Yes - No How many? _____
- Mercury sphygmomanometers? - Yes - No How many? _____
- Mercury oxide (mercury zinc) batteries? - Yes - No How many? _____
 - Do you recycle batteries? - Yes - No
 - Are you phasing out mercury batteries? - Yes - No
 - Do you recycle other types of batteries? - Yes - No
- Mercury lamps (e.g., fluorescent lights)? - Yes - No
 - Are your spent lamps recycled? - Yes - No

- Mercury weight esophageal dilators? - Yes - No How many?_____
- Mercury weight Cantor Tubes? - Yes - No How many?_____
- Mercury weight Miller Abbott Tubes? - Yes - No How many?_____
- Mercury weight feeding tubes? - Yes - No How many?_____
- Mercury-containing dental amalgams? - Yes - No
- Thermostats with mercury switches? - Yes - No
- Gauges with liquid mercury? - Yes - No
- Equipment with mercury switches? - Yes - No
- Displacement/Plunger Relay? - Yes - No
- Flame Sensor/Safety Valve (thermostat probes)? - Yes - No
- Hitachi Chem Analyzer? - Yes - No
- Electron Microscope? - Yes - No
- Mercury Barometers? - Yes - No
- Other mercury containing equipment? - Yes - No
- If yes, what kind?

Mercury in Lab: Do you use:

- ___ Histological fixatives
- ___ Zenker's Solution
- ___ Thimerosal
- ___ Carbol-fuchin stain
- ___ Gram iodine stain
- ___ Mercurochrome
- ___ Immu-Sal
- ___ Carnoy-Lebrun
- ___ Shardin
- ___ Takata's reagent
- ___ Golgi's

Please indicate response by **Y** = Yes, **N** = No, **D** = Don't know

- ___ Phenolic mercuric
- ___ Acetate
- ___ Alum
- ___ Mercury nitrate
- ___ Million's reagent
- ___ Nesser's solution
- ___ Mucolexx
- ___ Ohlamacher
- ___ Cajal's
- ___ Camco
- ___ Cesium Internal Std.
- ___ Mercury chloride
- ___ Mercury (II) oxide
- ___ Mercury (II) chloride
- ___ Mercury iodide
- ___ Hematoxylin (Solution A)
- ___ Channing's solution
- ___ B 5 fixative
- ___ Helly
- ___ Gomori's
- ___ Stabilur Tablets
- ___ Phenylmercuric Acetate

- Other mercury containing lab chemicals? - Yes - No If yes, what kind?

- Are you phasing out mercury laboratory chemicals? - Yes - No
- Are you phasing out mercury pharmaceutical products? - Yes - No
- Do any of your cleaners/degreasers contain mercury? - Yes - No - Don't know

Mercury Spills

- Estimate the number of spills of mercury in the facility last year? _____ - Don't know
- Estimate the amount of mercury involved in spills last year? _____ - Don't know
- What was the total estimated cost for all mercury spill cleanups last year? _____ - Don't know

Estimated total mercury (this is the toughest question!)

Based on your inventory, how much mercury do you estimate is in use at the facility? _____

How much mercury do you estimate went into a waste stream (solid, biohaz, water, haz)? _____

How much mercury in the past year was collected for proper disposal or recycling? _____

How many grams of mercury are in a barometer? The following web site has a mercury assessment work sheet on page 35 of the PDF file that lists mercury containing medical equipment and how many grams of mercury that piece of equipment has.

http://www.dhs.ca.gov/ps/ddwem/environmental/Med_Waste/guide_to_mercury_assessment_v1.00.pdf

Notes:

THE ACTION PLAN FOR MERCURY ELIMINATION BY 2005

Getting Started

1. Review the results of your facility specific inventory. Make a list of the areas where mercury-containing products and devices are used. There may only be specific areas where mercury products remain in use. Identifying areas that are carpeted is an important step, since chances are, you may not be able to budget for housewide replacement of all mercury containing products and devices in a single year. Budgeting for replacement of mercury containing products and devices in carpeted areas should be a higher priority than in other areas (spill clean up in carpeted areas is very difficult and can in some cases require disposal of an entire room carpet as hazardous waste, which is extremely expensive).
2. Contact your purchasing department and request annual “usage reports” for mercury containing products and devices. This action provides you with a written report of how many actual thermometers, sphygmomanometers or other products/devices were used and by which department.
3. Review the areas where mercury products/devices are still in use, and determine if those areas are slated for renovation or upgrade in the near future. If this is the case, then perhaps replacement of mercury-containing devices can be part of the renovations.
4. Identify areas where your facility is planning on expansion or renovation projects. Request that from this point forward, all new facilities and renovated areas are mercury-free. This means that as those areas are outfitted, no mercury containing products or devices will be installed (other than fluorescent lamps, which will be collected for recycling).
5. Contact manufacturers of mercury-containing products and devices in your facility and request information from them indicating the amount of mercury in each device. Ask them to fax this information to you. Request that they provide the information in grams (this will make your task of measuring pollution prevention — or how much mercury your organization did not import — lots easier).
6. Recruit a team. If you haven’t already enlisted the help of key colleagues, organize a committee to work on mercury reduction and elimination. Present the findings of your inventory, the usage reports, renovation/expansion plans as they relate to mercury products, and feedback from manufacturers. Provide the team members with a copy of the AHA - U.S. EPA agreement (<http://www.h2e-online.org>). Request the team to review the information and be prepared to meet to develop an action plan to address the problem.

7. Your organization's history with mercury: Contact Risk Management, Safety, Environmental Services or Environmental Health and Safety and determine what the current process is for managing mercury spills. Obtain data on how many spills have been reported in the past year, and what the clean up costs were. Obtain other historic data related to mercury if it is available. Inquire what measures have already been taken to minimize mercury, identifying key players in the past.

The plan

Work with your team to develop a plan to virtually eliminate mercury by 2005. It can be helpful to devise a timeline and work backwards. If the goal is to be virtually mercury-free by 2005, what steps need to be taken between now and then to ensure that the necessary steps take place? Your organization's plan will be unique to your setting, and relevant in the context of your organization's overall goals and commitment to the community. In any case, outlining an area by area plan to eliminate mercury containing products either on a wholesale or incremental basis is key.

Evaluating the plan for effectiveness

At the end of the first year, it is important to assess the effectiveness of the program. Summarize the actions taken and the outcomes achieved, including costs for replacement technology, costs for disposal and recycling of mercury and volumes of mercury accounted for (either as waste disposal, waste recycled or as amount of mercury NOT imported into the institution in products). Review and revise goals for the second year. Review challenges and how they were overcome.

EXAMPLE OF AN ACTION PLAN

Mercury-Reduction Plan for XYZ Hospital

Goals: Eliminate mercury-containing products and devices from XYZ hospital by 2005
(See attached memo from CEO setting this out as hospital policy)

Objectives:

1. Purchasing department: Develop policies to phase out future purchase of new mercury products and devices in accordance with the implementation of the plan. Work with the committee to identify the specific alternatives to be purchased.

LIST current products purchased, units purchased, and departments using them.

2. Prioritize mercury product and device replacement in carpeted areas (*spill cleanups are more difficult and costly in these areas*). List the specific areas and the timeline for changeover of thermometers and sphygmomanometers in each area (numbers and dates).

3. Develop a three year plan to phase out all existing mercury containing sphygmomanometers housewide, keeping objective two above in mind, and coordinate it with area renovation and new building plans. List specific areas undergoing renovation, types and number of devices in each area, scheduled of renovations, and specific units to be replaced and in what sequence.

4. Measure costs for mercury phase out efforts. Budget costs for equipment and product replacement in each area. Budget for disposal of old equipment and materials containing mercury that must be handled as hazardous waste or sent to a certified recycling firm. List firms that you have contracted with to take old materials. Establish a five year budget.

5. Measure volumes of mercury collected for recycling or waste disposal, and set up an annual accounting system to measure progress.

6. Measure volumes of mercury not imported into the facility for use as a result of new purchasing practices and policies. Add that to the accounting system.

7. Notify vendors to inform XYZ Hospital of any products that contain mercury or mercury compounds. Develop an annual review process to identify specific alternatives to these products.

8. Establish a collection program for fluorescent lamp tubes so that the used tubes can be aggregated for collection by a certified recycling company. Establish a facility wide battery collection program and establish a tracking system to account for number, weight and type of batteries collected. Contract with a certified recycling firm for disposal of batteries.

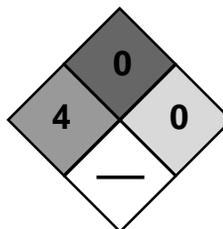
9. Report progress and results annually to Ohio EPA.

ATSDR MERCURY FACT SHEET FOR STAFF AND PUBLIC EDUCATION

MERCURY

Mercury
CAS# 7439-97-6
April 1999

Mercury
Hg



Agency for Toxic Substances and Disease Registry

This fact sheet answers the most frequently asked health questions about mercury. For more information, you may call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to mercury occurs from breathing contaminated air, ingesting contaminated water and food, and having dental and medical treatments. Mercury, at high levels, may damage the brain, kidneys, and developing fetus. This chemical has been found in at least 714 of 1,467 National Priorities List sites identified by the Environmental Protection Agency.

What is mercury?

Mercury is a naturally occurring metal which has several forms. The metallic mercury is a shiny, silver-white, odorless liquid. If heated, it is a colorless, odorless gas. Mercury combines with other elements, such as chlorine, sulfur, or oxygen, to form inorganic mercury compounds or “salts,” which are usually white powders or crystals. Mercury also combines with carbon to make organic mercury compounds. The most common one, methylmercury, is produced mainly by small organisms in the water and soil. More mercury in the environment can increase the levels of methylmercury that these small organisms make. Metallic mercury is used to produce chlorine gas and caustic soda and also used in thermometers, dental fillings, and batteries. Mercury salts are used in skin-lightening creams and as antiseptic creams and ointments.

What happens to mercury when it enters the environment?

- Inorganic mercury (metallic mercury and inorganic mercury compounds) enters the air from mining ore deposits, burning coal and waste, and from manufacturing plants.
- It enters the water or soil from natural deposits, disposal of wastes, and volcanic activity.
- Methylmercury may be formed in water and soil by small organisms called bacteria.
- Methylmercury builds up in the tissues of fish. Larger and older fish tend to have the highest levels of mercury.

How might I be exposed to mercury?

- Eating fish or shellfish contaminated with methylmercury.
- Breathing vapors in air from spills, incinerators, and industries that burn mercury-containing fuels.
- Release of mercury from dental work and medical treatments.
- Breathing contaminated workplace air or skin contact during use in the workplace (dental, health services, chemical, and other industries that use mercury).
- Practicing rituals that include mercury.

How can mercury affect my health?

The nervous system is very sensitive to all forms of mercury. Methylmercury and metal vapors are more harmful than other forms, because more mercury in these forms reaches the brain. Exposure to high levels of metallic, inorganic, or organic mercury can permanently damage the brain, kidneys, and developing fetus. Effects on brain functioning may result in irritability, shyness, tremors, changes in vision or hearing, and memory problems. Short-term exposure to high levels of metallic mercury vapors may cause effects including lung damage, nausea, vomiting, diarrhea, increases in blood pressure or heart rate, skin rashes, and eye irritation.

How likely is mercury to cause cancer?

There are inadequate human cancer data available for all forms of mercury. Mercuric chloride has caused increases in several types of tumors in rats and mice, while methylmercury increased kidney tumors in male mice. The EPA has determined that mercuric chloride and methyl mercury are possible human carcinogens.

How can mercury affect children?

Very young children are more sensitive to mercury than adults. Mercury in the mother's body passes to the fetus and can pass to a nursing infant through breast milk. However, the benefits of breast feeding may be greater than the possible adverse effects of mercury in breast milk. Mercury's harmful effects that may be passed from the mother to the developing fetus include brain damage, mental retardation, and in coordination, blindness, seizures, and an inability to speak. Children poisoned by mercury may develop problems of their nervous and digestive systems and kidney damage.

How can families reduce the risk of exposure to mercury?

Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs. Do not vacuum up spilled mercury, because it will vaporize and increase exposure. If a large amount of mercury has been spilled, contact your health department. Teach children not to play with shiny, silver liquids. Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children. Pregnant women and children should keep away from rooms where liquid mercury has been used. Learn about wildlife and fish advisories in your area from your public health or natural resources department.

Is there a medical test to show whether I've been exposed to mercury?

Tests are available to measure mercury levels in the body. Blood or urine samples are used to test for exposure to metallic mercury and to inorganic forms of mercury. Mercury in whole blood or in scalp hair is measured to determine exposure to methylmercury. Your doctor can take samples and send them to a testing laboratory.

Has the federal government made recommendations to protect human health?

The EPA has set a limit of 2 parts of mercury per billion parts of drinking water (2 ppb). The Food and Drug Administration (FDA) has set a maximum permissible level of 1 part of methylmercury in a million parts of seafood (1 ppm). The Occupational Safety and Health Administration (OSHA) has set limits of 0.1 milligram of organic mercury per cubic meter of workplace air (0.1 mg/m³) and 0.05 mg/m³ of metallic mercury vapor for 8-hour shifts and 40-hour work weeks.

Source of Information

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. Animal testing is sometimes necessary to find out how toxic substances might harm people and how to treat people who have been exposed. Laws today protect the welfare of research animals and scientists must follow strict guidelines.

Where can I get more information?

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

For more information, contact:

Agency for Toxic Substances and Disease Registry
Division of Toxicology
1600 Clifton Road NE, Mailstop E-29
Atlanta, GA 30333
Phone: 1-888-422-8737
FAX: 404-639-6359

Source: ATSDR web site <http://www.atsdr.cdc.gov/tfacts46.html> April, 1999.

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Christopher Jones, Director



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