

# How to Plan and Hold a Mercury Fever Thermometer Exchange



## A Mercury Fever Thermometer Exchange

is an event at which participants turn in mercury fever thermometers brought from their homes and, in return, receive a non-mercury fever thermometer or a voucher for an alternative thermometer.

These exchanges not only educate about the environmental and public health effects of mercury, they also provide participants with the opportunity to be part of the solution to the mercury problem.

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# The Problem with Mercury Thermometers

**m**ercury thermometers are made of glass and are about the size of a straw, with a silvery-white liquid inside. Mercury fever thermometers have been used for decades as a first step in caring for someone who feels sick. But, ironically, the mercury thermometer can be a risk to the health of families and communities. Mercury is a toxic substance that can harm both humans and wildlife.

Many families have had a mercury thermometer in their medicine cabinet for years without breaking it. But mercury thermometers are very easy to break and very difficult to clean up. To function properly, mercury thermometers must be “shaken down” before use, creating a constant high potential for breakage. Public health officials across the country report a steady stream (over 18,000 to poison control centers in 1998 alone) of concerned calls from broken mercury thermometers. Fever thermometers are the largest single source of mercury discarded annually in municipal solid waste, estimated at 17 tons of mercury per year.

When a mercury thermometer breaks, it is difficult to clean up properly. Sometimes parents may not know that their child has broken a thermometer. Sometimes mercury from the broken thermometer spills into a crack in the floor or soaks into a carpet. If mercury spills from a thermometer and is not cleaned up, it will all evaporate, potentially reaching dangerous levels in indoor air. A single broken fever thermometer, containing 0.5 to 1.5 grams of mercury, is enough to create a health risk if it evaporates into a small, poorly ventilated room.



Mercury affects the human brain, spinal cord, kidneys and liver. It affects the ability to feel, see, taste and move. It can cause tingling sensations in the fingers and toes, a numb sensation around the mouth and tunnel vision. Long-term exposure to mercury can result in symptoms that get progressively worse and lead to personality changes, stupor and coma. Wildlife populations, especially loons, are already exhibiting effects of mercury poisoning. There is already so much mercury pollution that more than 40 states are currently warning residents not to eat certain species of fish caught in all or some of the state’s lakes, rivers, streams and coastal waters.

In pregnant women, mercury can pass through the placenta, where it affects fetal development by preventing the brain and nervous system from developing normally. Affected children show lowered intelligence, impaired hearing and poor coordination. Their verbal and motor skills may be delayed. Because of these threats to the developing fetus, the federal government recommends that women who are pregnant or who may become pregnant not eat mercury-contaminated fish.

# Planning Your Exchange

## Introduction

The success of an exchange or roundup depends on the successful promotion of the event. If people do not know about the event, you've lost your opportunity to collect thermometers and to educate about the health and environmental impacts of mercury. Your audience will define the way you promote and plan your exchange, and therefore its budget and ultimate success.

Experience has shown that there are three main types of exchanges, based on the audience you are trying to engage. These exchanges are:

- Hospital and Other Workplace Exchanges
- School Exchanges
- Community Exchanges

Workplace and school exchanges are relatively simple exchanges to undertake. Primarily, this is because your audience is easily defined. You have a few direct and straightforward means to inform possible participants about the event. Promotion is therefore simple and inexpensive. In addition, the audience is a "known quantity" and easily estimated. Based on either number of employees or number of students, a simple formula can then be used to estimate the quantity of exchange thermometers or vouchers needed. This helps simplify budgeting.

Relative to workplace and school exchanges, community exchanges are more complex. You may need to use a wide variety of promotion mechanisms including paid advertising. You may not be able to adequately determine the demand for alternative thermometers or coupons and be required to adopt a "while supplies last" approach. Fundraising from a broad range of potential sources may be required before you can hold a community exchange.

Yet, all three types of exchanges can be highly successful events not only in the number of thermometers collected, but in terms of environmental and public health education. Like any project, their success is dependent on good planning. This guide is intended not only to help encourage you to undertake a thermometer exchange, but to help and assist you in the process so that it is a success.

## Why Hold a Mercury Fever Thermometer Exchange?

### An Opportunity for Education

A mercury fever thermometer exchange can provide a wonderful opportunity to educate about the hazards of mercury. An exchange can also inform people on the actions they can take to reduce the risk of mercury contamination of the environment and to protect the health of their families and the community. If you host a staff exchange in your workplace, it can be a part of an employee wellness program or a kick-off or culmination event for an in-house mercury elimination program.

### Easy to Coordinate with Big Payoffs

Mercury thermometer exchanges are worth the effort they take to put together, since the benefits of an exchange are numerous.

- When given information about the hazards of mercury thermometers, people are eager to find a safe place to get rid of them.
- Providing a free non-mercury alternative is a big bonus. People are always thankful to get something for free, especially when the associated benefits are so positive.
- The public image and media opportunities are sizable.

This is a win-win situation for everyone and the public and the press will be receptive to that message.

## Choosing a Non-Mercury Fever Thermometer

While there are a variety of mercury-free fever thermometers available in the market place, there are four main types that fall within the budget of an exchange. These alternatives are the liquid crystal, the gallium, the digital, and the solar thermometer. The liquid crystal thermometer is a cardboard strip with a series of dots at the end. The dots, containing a special crystal, change color with temperature. The gallium functions like, and is somewhat similar to, a mercury thermometer. Instead of mercury, it contains galinstan, an alloy of gallium. The digital thermometer is electronic and uses a button battery for power. The solar thermometer is similar to a digital except it uses no button battery. For extra value when comparing prices and vendors, ask if their model is waterproof and remember that there are price reductions for large quantity purchases. The following table highlights some of their benefits and drawbacks:

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## Thermometer Replacement or Voucher .....

One decision that needs to be made early in the planning process is whether you want to distribute non-mercury thermometers, or work with local retailers to accept vouchers for a free or discounted non-mercury replacement. Either option will work, but it is important to keep in mind that the easier it is for a participant to exchange their thermometer for a new one, the more likely they will participate in a program. Using a voucher may be perceived as adding an extra step or hurdle. In addition, should you decide to work with a retailer on a voucher program, it is important to ensure that they do not sell mercury thermometers.

## Estimating how many thermometers are needed .....

Deciding how many thermometers are needed is important for budgeting. As discussed earlier, the number of thermometers brought in is directly related to promotion of the event. If only one mercury-free thermometer is exchanged per household, a reliable estimate for workplace and school events is easy to determine. For school roundups, experience has determined an exchange rate range of 18% to 25% on a student population basis, and for the workplace an exchange rate of 11% to 18% based on the quantity of employees. If the event is well-promoted and you have good support within the school or workplace, you can estimate an exchange rate on the high end of the range given. For small schools and workplaces (less than a population of 500), the return rate is also typically on the higher end of this range. This table gives two examples of how to estimate the amount of thermometers that will be needed.

Location	Anywhere Hospital	Anywhere High School
Population	4000 employees	600 students
Expected exchange rate	11% to 18%	18% to 25%
Level of exchange awareness <small>(guess-estimate based on population size and level of promotion)</small>	Low to medium	High
Estimated exchange rate	13%	25%
Exchange factor	.13	.25
Quantity of thermometers needed	4000 x .13= 390	600 x .25= 150

	Reuseable Liquid Crystal	Gallium	Digital	Solar
<b>Cost Estimate</b> <small>(2002 US Dollars)</small>	\$1.25	\$2.70	\$2.85	\$5.10
<b>Advantages</b>	Inexpensive	Relatively inexpensive	Easy to use and read	No button battery
<b>Disadvantages</b>	May be perceived as less durable	May be confused for a mercury	Contains button battery	More expensive

\* See appendix B for contact information

## Funding

Before you go looking for funding, it is important to know what you are asking for. Is it money, thermometers, or other in-kind support? The simplest exchange requires thermometers (or vouchers), disposal, and perhaps some money for printed promotional materials. Compared to many programs, the funding budget for a thermometer roundup can be rather small.

Your funding may also be helped if you have an opportunity to piggyback an exchange with a community or children's health fair, an Earth Day event, or a local household hazardous waste collection. If so, issues such as planning and publicity may be easier to handle. It may be worth checking into your local community calendar to see if such opportunities exist.

Some mercury exchanges can get quite involved, with high profile names invited to attract media, or food at a reception to attract participation. High-profile events will typically require a higher budget. While these niceties can turn the work of organizing a simple exchange into a spiraling quest for funding, they can also provide excellent benefits. See the following section on receptions.

When looking for funding for your exchange, there are a variety of avenues that you can explore. Because mercury exchanges are a "feel good" type of event, they are often well received by potential sponsors. Consider both the public health and environmental aspects when soliciting funds. Furthermore, funding may be in-kind. Do not ignore free food for a reception, free disposal, and most importantly, free advertising or promotional items. The following is a list of some sources that may be able to help your fundraising.



## POTENTIAL SPONSORS AND THEIR INVOLVEMENT

### • Corporate Sponsors

- A mercury exchange is a way for them to be seen as environmentally responsible.
- It may fit with a corporate employee wellness program.
- It may fit with a need to be seen as a good community citizen.

### • State or Local Pollution Control Agencies

In many areas of the country, mercury is increasingly an area of regulatory concern. Your state or local agency may have money targeted for mercury.

### • Pharmacy Chains/Thermometer Vendors

The larger pharmacy chains may be able to give some form of discount program and/or free thermometers. Some thermometer vendors have given out complimentary thermometers.

### • Solid and/or Hazardous Waste Haulers

Many "haulers" have a financial interest in assuring their loads are mercury-free. In addition, a mercury exchange is an excellent way for this industry to promote itself as environmental and community stewards.

### • Hospitals

In 1998, the American Hospital Association signed an agreement to virtually eliminate their use of mercury. Since then, over 300 hospitals have taken the pledge to practice mercury-free medicine. Your hospital may be interested in being involved to help promote their mercury reduction efforts, and promote their mission of community health.

### • Wastewater Treatment Plants

Wastewater treatment (WWT) plants have mercury discharge permits that are becoming more stringent. Some permits may have conditions, which allow the WWT plant to do pollution prevention work as a means to meet their permit. A mercury thermometer exchange is an excellent means to do, and educate on, mercury pollution prevention.

### • Household Hazardous Waste (HHW) Collection Facilities

These facilities are in the business of collection of HHW and may be able to offer free disposal. Based on their knowledge of mercury waste generators, they may be able to offer good leads on related businesses in town.

## Mercury Thermometer Disposal

Experience has shown that those helping with the exchange and those turning in their thermometer will want to know the eventual fate of the mercury in the thermometers. Currently, the mercury in mercury thermometers and other mercury-containing devices is recycled using a process called "roast, retort and distillation." Basically, the mercury-containing items are crushed and heated so that the mercury evaporates, and is thus separated from the glass and other debris. The gaseous mercury is then retorted or condensed back to a liquid state. The liquid mercury is then distilled to remove impurities and can be used again in new, mercury-containing products.

It may be a surprise to many that their mercury may actually return back to commerce in another mercury device. While there is broad agreement on the serious toxicity of mercury, and governments have called for its phase-out, it is still sold in products for which viable, cost-competitive alternatives exist. This is yet another reason why a mercury thermometer exchange can be so important, for they can be used to educate homeowners on other places where mercury can be found in the home and alternatives to its use.

To get a list of all facilities in your area that can provide this process, contact either your hazardous waste hauler, or your state department of environmental protection/services. In choosing a facility, check references and with state officials to insure the facility is fully permitted and that there are no EPA or OSHA violations against the facility. This is very important. So do your homework on a facility before you send your mercury to them.

Ask the mercury reclamation facility how they want the mercury contained and labeled for the collection, storage, and transportation of the mercury thermometers. They will probably want the thermometers collected in a Department of Transportation (DOT) approved shipping container. They should be able to provide you with this assistance.

## Reception

A workplace reception can be a great way to help promote the exchange, but at the same time can require a lot of planning time. This must be weighed against the fact that a well-planned reception can produce excellent benefits. High-visibility events often attract the interest of senior management. As senior management gets involved in the planning and implementation of the round-up, they gain a vested interest in the long-term success of the mercury elimination program, not simply as a one-time event organized by the general staff. At a large urban Boston hospital mercury thermometer round-up reception, senior management announced that they would design a program to eliminate all mercury-containing blood pressure measuring devices and replace them with non-mercury alternatives.

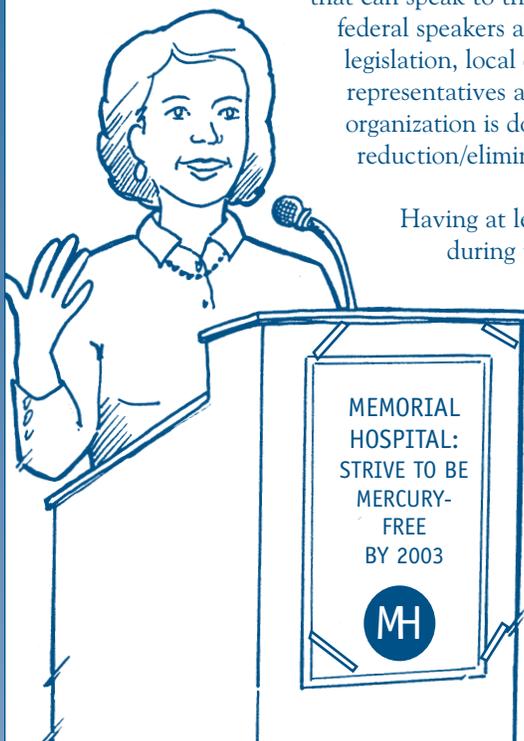
## Benefits of High Visibility Exchange

HCWH's round-up at a Boston hospital focused on clinical fever thermometers. Because of the success of this event, senior management took it upon themselves to put a policy in place to round up all research laboratory mercury thermometers and replace them with non-mercury alternatives. The bottom line was that a larger event attracted the attention of decision makers who bought into the program.

In the hospital setting, by virtue of medical profession involvement, a reception can help draw attention to mercury as a public health issue. At a reception, it is useful to have a display on mercury, mercury-free alternatives in the home and workplace, and mercury pollution prevention literature.

Options for speakers include physicians or other clinicians that can speak to the health hazards of mercury, state or federal speakers addressing the status of mercury legislation, local environmental organization representatives and workplace staff on what that organization is doing to address mercury reduction/elimination.

Having at least cookies and punch available during the event is also a good idea. One of the event's goals is to provide additional information about mercury hazards. Providing food means that people will stick around and give you more time to give them that information. Providing cookies is also celebratory and adds to the positive atmosphere of the event.



## Publicity

There are a variety of ways to publicize your exchange. The following list provides some ideas on how to get the word out. (See Appendix A for templates)

### Workplace and School Exchanges

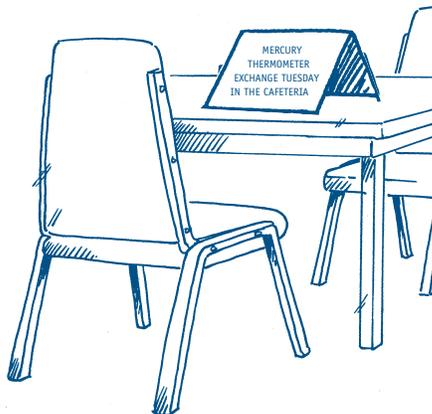
- Fliers (send home with students)
- Classroom of departmental meeting presentations by peers
- Table tents - cafeteria, lunch room or staff lounges
- Newsletters, including small neighborhood papers or “shoppers”
- E-mail announcements (the day before event, post an automatic announcement “don’t forget your mercury thermometer tomorrow!”)
- Announcement in payroll checks

### Community Events

- Fliers
- Public service television and radio spots
- Newspapers
- Community Websites
- Community, health and environmental organizations’ newsletters and e-mail lists

### Event Coverage

- Contact radio (on-site coverage), newspapers and television stations ahead of time to cover event.
- Submit articles to magazines, trade journals and community organizations to summarize the event’s success.



## Educational Opportunities

Before the event, collect enough educational materials to distribute. Listed below is a sampling of information you might want to provide:

- HCWH’s *Making Medicine Mercury-Free\**
- HCWH’s *Mercury Thermometers and Your Family’s Health\** (available in a variety of languages including Spanish and Hmong)
- HCWH’s *How to Plan and Hold a Mercury Fever Thermometer Exchange\**
- HCWH’s *A New Era: The Elimination of Mercury Sphygmomanometers*
- HCWH’s Mercury-free Thermometer Pharmacy Campaign information
- Your state’s fish advisories
- List of other mercury-containing items in the home and workplace
- Local and state contact information about mercury disposal options for other mercury-containing household items

\* Please be sure to contact HCWH 3-4 weeks in advance with an estimate of how many copies are needed.

## Safety and Environmental Logistics

It is important to make sure that in all promotional materials, participants are told to bring in their thermometers in a rigid container, and to place the container in a zip-lock bag, as a second measure of protection. The original case in which the thermometer was bought works perfectly, but any other non-breakable container (toothbrush case or plastic soft drink bottle with screw-on top) will also work. These precautions are important to prevent the thermometer from breaking on the way to the exchange, and to protect the health and safety of the participant, should it still break.

Work with workplace or state safety or hazardous materials specialists during the event planning process to ensure that regulatory and compliance issues are being considered. If you are going to transport the collected thermometers to the disposal facility, it is important to ensure that transport and labeling regulations are being followed. Mercury destined for reclamation is considered a federally designated “universal waste”, but contact your state’s hazardous materials section to ensure you will be in compliance with your state’s environmental requirements. Someone with mercury spill cleanup training, and a mercury spill kit should be available at the event.

## Mercury-Free Pharmacy Campaign

Some states and cities have banned the sale and distribution of mercury thermometers. A number of leading pharmacy chains have also agreed to voluntarily end the sale of fever mercury thermometers. Yet, in a majority of the states, and all Canadian provinces, mercury thermometers may still be sold. If you have the time, send a letter to your local pharmacy asking them to stop selling mercury thermometers. Use the sample letter in Appendix C.

## Location and Schedule of the Exchange

It is important to time your exchange so that it is convenient for those participating in the event. In a workplace with shift workers, try at a minimum to schedule the exchange over one shift change. It is easy for exchange participants to turn in their thermometer at the beginning or end of their shift. If possible, try to hold the exchange for at least two hours, but longer is preferable. The longer it is open, the greater the chance that word of mouth will remind workplace staff of the event. For school events, make sure the exchange occurs when students are able to participate. Before school starts and during lunch are times that have proven successful for school exchanges.

Holding the exchange in a popular community meeting area will also help the success of the exchange. Typically, the most successful meeting place is the work or school cafeteria. Setting up the “exchange table” outside the cafeteria doors will guarantee a steady stream of people. In many hospitals, there is a shift change at the lunch hour. Accounting for location and timing will help the exchange tremendously.

## Other Considerations

### Establish Guidelines

Many exchange participants will bring in more than one mercury thermometer from their home. Make sure people understand that they can bring in as many as they have. At the same time, it is important to have a clear guideline on how many non-mercury thermometers they can take home. Many exchanges have adopted a policy of one mercury-free alternative per family. This way, participants aren't discouraged from bringing in more than one thermometer, and are encouraged to collect those from other family households.

It is also important to have a policy on accepting other mercury-containing equipment. Unless you want to be inundated by mercury-containing devices, never advertise your collection as anything but a thermometer exchange. At the same time, it is hard to turn away someone trying to do the right thing by bringing in their thermostat or other mercury-containing device. Thermometer exchanges have accepted a five-pound bottle of mercury, thermostats and other mercury devices. The choice is yours, but having a good guideline in place before the day of your exchange can save you lots of headaches.

### Mercury from Home or Business

On a related note, some workplaces will ask whether they can dispose of some of their business waste through your exchange program. It can be difficult when a representative from a department you have not worked with asks for a special favor, hoping to save on mercury disposal costs. It is especially difficult if you do not work in the workplace and get caught in a struggle between that department and the one helping facilitate the exchange. Again, the choice is yours to make. What you should be aware of is that many states regulate business waste differently than household waste. If you are deliberating whether to take workplace mercury through your program, it is advisable to check with your state regulators and/or disposal facility to see if you will be violating any state laws. You should be prepared when the science department head asks if you could take the sixty broken lab thermometers they have been storing, or the hospital maintenance department asks you to take in fifteen pounds of mercury.

## Plan for Success

Either due to good promotion or a small budget you should also be prepared with a contingency plan in case you run out of thermometers. Will you offer a voucher that the participant can redeem in the future, will you turn them away, or do you promote the exchange of free thermometer only “while quantities last”? It is also good to be prepared for people wanting to exchange a thermometer the day after the event, or after the exchange has closed for the day. There will typically be employees that will be reminded of the exchange only when they see the exchange table on the day of the event. To collect from these latecomers, you can hold and advertise subsequent make-up days, or in the case of a workplace exchange, provide the time and office or other location where they can drop them off during working hours. This is particularly important where the workplace has three shifts. It may be logistically too difficult to hold the exchange during the second shift change. Providing the third shift with an option not only makes the exchange inclusive but also more successful. Finally, make sure to make participants aware of the hours and location of the local household hazardous waste facility. They might have mercury or other wastes that they want to get rid of responsibly.

## Close the Loop

Some states such as Minnesota, have banned the sale of mercury thermometers. The loophole that still exists is that in many states/provinces, some pharmacies still sell mercury basal and fever thermometers. If you have the time and resources, send letters to all your local pharmacies and ask them to stop selling mercury thermometers, once those still in stock are sold. Follow up your letter with a phone call, about one week after you have mailed the letter. (See Appendix C for a sample letter). This is especially important if you are doing an exchange in a hospital. It can be very embarrassing to your efforts if a reporter covering the event inquires at the hospital pharmacy and finds them still selling mercury thermometers. Finally, educate yourself and have information available, which can answer questions raised on the accuracy of mercury alternatives. (See Appendix E for more information.)

## Moving Mercury Policy

Mercury collected in a thermometer exchange will in all likelihood be recycled back into new mercury products and sold in commerce. While our current national mercury policy can be perplexing, a thermometer exchange helps to educate the community about the dangers of mercury and importantly, removes a potential source of mercury exposure from the home. One way to help change current policy, and work towards the ultimate removal of mercury from retail sale (or close the loophole), is to ask our government to prevent recycled mercury from reentering the marketplace, and add it to the stockpile that it currently maintains until a preferred long-term solution is developed. We can also ask that research monies be directed toward the development of a longer term solution that eliminates mercury release. Have a sign-on letter (see Appendix D) at your exchange that participants can take with them, or preferably, can sign on-site.



## Mercury Ordinance Toolkit

To help protect the health and environment of their communities, many organizations have also worked to successfully introduce and pass local ordinances that prohibit the sale of mercury thermometers (and in some cases other mercury-containing items). After a ban was passed unanimously in Duluth, Minnesota, the Chamber of Commerce sent a letter to all the mayors along the Great Lakes Basin, asking them to enact a similar ban. Bans have also been passed in major cities such as Chicago, Boston and San Francisco. To help local residents, HCWH has put together an "Mercury Ordinance" toolkit which includes sample letters of support, model ordinances, fact sheets that document health impacts from mercury thermometer spills, and other educational resources. To receive this toolkit, contact HCWH at 202-234-0091 or visit [www.noharm.org](http://www.noharm.org).

# Exchange Day

## Collection Procedure

Participants remove unbroken thermometer from their rigid container and place it on the piece of plastic (or thin bubble wrap), which is spread on a tray. If the thermometer is broken, do not remove it from its rigid container and place it in the large collection container.

Keep track of number of thermometers collected and the number of families participating (which should be the same as the number of non-mercury thermometers exchanged). A flip chart may be used to visually show progress throughout the exchange event.

When the tray “fills up”, wrap the stack of unbroken thermometers in plastic, secure it with a rubberband or tape, and place it in the collection container. The collection container should be labeled “Mercury Thermometers” and have a lid (five gallon containers used in food service or for drywall spackle work well.) Participants should not reach in or place their thermometers directly into container.

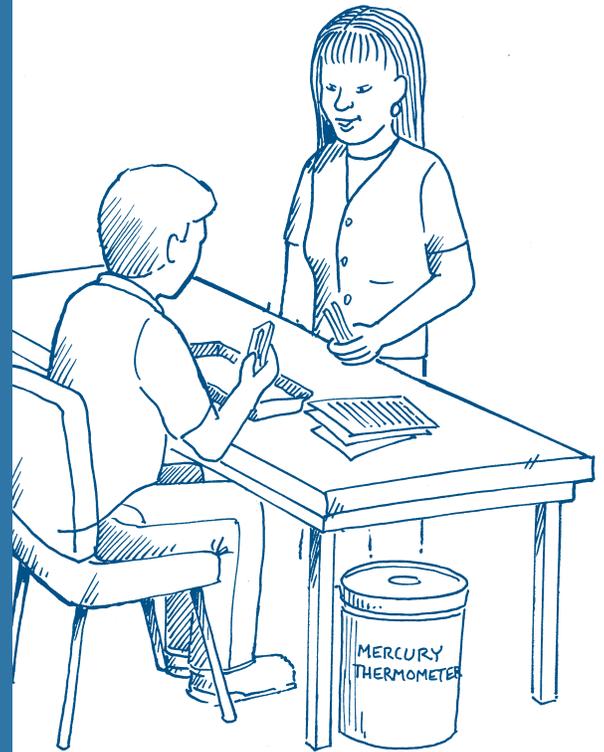
Broken thermometers should be placed directly into collection container.

## EVENT DAY CHECKLIST

- Table and chairs for volunteers
- Banner/posters (see Appendix A)
- Mercury spill kit and emergency procedure in place
- Collection tray
- Plastic wrap or thin bubble wrap
- Collection bucket with lid
- Sign “Mercury Thermometers” on bucket
- Large trash can for rigid thermometer holders
- Flip chart, marker – tracking participation
- Media, public affairs readiness

### IF HOLDING A RECEPTION:

- Number of tables \_\_\_\_, table cloths
- Vendor accommodations
- Speaker podium, PA system
- Food, drinks and trash containers



# Fact Sheets and Flyers\*

S A M P L E F L I E R

## How Can I Prevent Mercury Pollution?

Improper mercury disposal includes pouring it down drains, putting it in the trash, and burning it in barrels and incinerators.

**Here's what you can do:**

- Know which products contain mercury.
- Avoid buying products that contain mercury whenever non-mercury substitutes are available.
- Recycle mercury-containing products through Household Hazardous Waste (HHW) collections in your area. (Call your town office for more information).
- Conserve energy to reduce reliance on coal burning for fuel, which is a major source of mercury pollution.

S A M P L E P O S T E R

## MAKING MEDICINE MERCURY-FREE MERCURY THERMOMETER SWAP EARTH DAY CELEBRATION

**THURSDAY, APRIL 22**  
**Hospital ROTUNDA, 11am-4pm\***

- Hospital Staff - bring in your home mercury thermometer for a free digital non-mercury thermometer.
- Reception at noon. Speakers from (your hospital) community, invited speakers, and Health Care Without Harm.
- Find out more about mercury - what your hospital is doing to eliminate its use and what you can do in your home to minimize/eliminate its hazards.

3rd shift - go by Housekeeping Office, 6:30am, April 22nd.

\* Available electronically at [www.noharm.org](http://www.noharm.org)

# Mercury-free Thermometer Vendors

HCWH does not endorse any of the following vendors.

**Liquid Crystal Thermometers**

Medical Indicators, Inc.  
2011 Palomar Airport Road  
Suite 100  
Carlsbad, CA 92009  
888-930-4599

**Digital Thermometers**

Becton Dickinson  
1 Becton Drive  
Franklin Lakes, NJ 07417  
201-847-6800  
[www.bd.com](http://www.bd.com)

BestMed Inc.  
720 Corporate Circle, Suite R  
Golden, Colorado 80401  
877-299-6700

Omron Healthcare, Inc.  
300 Lake View Parkway  
Vernon Hills, IL 60061  
800-231-3434  
[www.omronhealthcare.com](http://www.omronhealthcare.com)

RG Medical Diagnostics  
21130 Bridge St.  
Southfield, MI 48034  
888-596-9498  
[www.rgmd.com](http://www.rgmd.com)

**Gallium Thermometers**

RG Medical Diagnostics  
21130 Bridge St.  
Southfield, MI 48034  
888-596-9498  
[www.rgmd.com](http://www.rgmd.com)

**Solar Thermometers**

RG Medical Diagnostics  
21130 Bridge St.  
Southfield, MI 48034  
888-596-9498  
[www.rgmd.com](http://www.rgmd.com)

## Mercury-Containing Products

## Alternatives/Examples

Thermometers	Digital thermometers (don't forget to recycle the battery)
Batteries	Alkaline batteries (look for mercury-free batteries, dispose of others at local HHW collections)
Thermostats and switches	Electronic or mechanical devices - dispose of the mercury-containing items at local HHW collections
Contact lens solution	Solution without Thimerosal - check ingredients
Light bulbs (fluorescent, mercury vapor, neon, metal halide, hp sodium)	Tungsten Filament (dispose of mercury-containing lightbulbs at local HHW collections)
Soaps (including antibacterial soap)	Soaps without Triclosan
Detergents/cleaners/bleach: Clorox	Clorox Plus® (not other Clorox®), Austin

### SAMPLE FLIER

## THE CASE AGAINST MERCURY: THE PROBLEM WITH MERCURY THERMOMETERS

- Mercury causes a variety of health effects, particularly for young children, including nervous system damage, liver damage, kidney damage, muscle tremors, impaired coordination, and mental disturbances.
- A thermometer contains about 0.5-1.5 grams of mercury. One gram of mercury can contaminate a twenty-acre lake with enough mercury to cause public advisories (warnings) to limit consumption of fish caught in that lake.
- Fever thermometers are the source of 17 tons of mercury discarded annually in municipal solid waste!
- Eliminating even small amounts of mercury has a beneficial effect on the environment, and reduces the potential for human mercury poisoning.
- (Your hospital) is committed to eliminating non-essential uses of mercury and mercury-containing products. Removing mercury thermometers is a responsible action in continuing to serve the health care needs of our communities while protecting the environment. (The type of replacement, i.e. digital etc.) thermometers provide comparable accuracy and do not compromise patient care in any way.
- Thank you to Acme Technologies Inc. - A Waste Management Company for the donation of the digital thermometers for this event! For more information contact the Office of Safety and Environmental Programs, (phone number).

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### Sample Radio Script for Mercury Thermometer Exchange

- 30 second spots -

Many families have had a mercury thermometer in their medicine cabinet for years, without it breaking. Yet, public health officials warn that a broken thermometer can pose a serious risk to your family's health and the environment. Even if you've never broken a mercury thermometer, it doesn't mean you never will.

Protect your family's health - Bring your mercury thermometer to (collection facility) before it breaks and receive a non-mercury replacement free while supplies last. For more information, call (your organization and phone number).

# Mercury-free Thermometer Pharmacy Campaign Draft Letters\*

Local or Corporate Pharmacy  
Address

Dear Contact:

As you may know, mercury has been identified as a major source of environmental pollution. It is also widely recognized that elemental mercury and mercury compounds are hazardous to human health. Because of these concerns there are many voluntary and legislative initiatives around the country aimed at eliminating the use of products containing mercury. Eight states have now banned the sale of mercury thermometers, and approximately 75% of U.S. retail pharmacy stores have voluntarily committed to end the sale of mercury thermometers.

Mercury thermometers have the potential to pose an immediate health threat to your customers as well. If the mercury spilled from a broken thermometer is not adequately cleaned-up, it will evaporate, potentially reaching dangerous levels in indoor air. Eighteen thousand calls were made to poison control centers and emergency rooms in the United States in 1998 because of broken mercury fever thermometers. Some of these exposures have resulted in serious health effects for the people involved.

I am writing to ask that your pharmacy also voluntarily pledge to end the sale of mercury thermometers. With such a commitment you will join the majority of North American outlets that recognize the importance of protecting the health and welfare of your customers.

In closing, I have enclosed a copy of HCWH's Mercury Thermometer educational brochure. Copies are being distributed to daycare centers, medical clinics, and other interested organizations across North America. Should you have further questions please do not hesitate to contact me. I will follow up with a call in the near future.

Sincerely,

Concerned Citizen

Cc: Health Care Without Harm (US)  
Canadian Coalition for Green Healthcare (Canada)  
30 Duncan St., Suite 201 Toronto, ON M5V 2C3

# Mercury Policy – Draft Letter

Honorable Christie Whitman, Administrator  
US Environmental Protection Agency  
Ariel Rios Building  
1200 Pennsylvania Avenue, N.W.  
Washington, DC 20460

Environment Minister  
Government of Canada  
Terrasses de la Chaudiere, 28th Flr.  
10 Wellington St., Hull QC  
K1A 0H3

Dear Administrator Whitman (Environment Minister):

I am contacting you because I am concerned about recent scientific reports about the health impacts of mercury, and I need your help.

- In March 2001, the Centers for Disease Control issued a report in which it was estimated that one in 10 women of childbearing age in the United States are at risk of having newborns with neurological problems due to *in utero* mercury exposure.
- In August 2001, the State of Massachusetts advised young women and children under age 12 to stop eating most fish from the state's waters and to limit their consumption of tuna because of mercury contamination.
- Again in August 2001, the American Association of Pediatrics encouraged parents to remove mercury thermometers from their homes and concluded that efforts should be made to reduce exposure to the extent possible to pregnant women and children as well as the general population.

Clearly, mercury in the environment is a problem, and (I, *my organization*, etc) decided to do our part to help solve the problem by (*organizing a mercury thermometer roundup, or other mercury reduction initiative*). Through this work I was surprised to learn that mercury collected for recycling is made into new products and ultimately returned to the marketplace and sold in new products. If we are truly concerned with mercury pollution, I do not believe this policy makes sense.

For this reason I am writing for your help in protecting the environment, by eliminating the loophole in regulations that allows mercury - a toxic substance- to go back out into new products. Specifically, I am asking that the US Environmental Protection Agency (Environment Canada) expeditiously adopt a policy that would effectively prevent the resale of recovered mercury and to develop a mechanism whereby this mercury would be stockpiled. As the Department of Defense currently maintains a mercury stockpile, implementation would not be inconsistent with current federal practice. Such a policy would be far more protective than that which currently exists. Furthermore, for long-term policy, I would strongly encourage the EPA (Environment Canada) to research and develop a technology that can cost-effectively stabilize mercury and prevent any mercury release under long-term durability testing.

Thank you for your consideration of this issue.

Sincerely,  
*Exchange participant, organizer, etc*

## Selecting Non-Mercury Fever Thermometers

Alternatives to glass/mercury thermometers are quite appealing as they are easier and faster to use and avoid the shortcomings of glass/mercury thermometers. The risks of broken glass and exposure to mercury are eliminated, as well as the cost of a clean-up and disposal of mercury from a broken thermometer. With the variety of alternatives available, it is essential that one make an educated choice, to ensure that the tool satisfies the task. Here are some points worth thinking about when you consider thermometers:

**1. Acceptable standards of accuracy** - Thermometers for medical use are typically tested to voluntary standards set by the American Society of Testing and Materials (ASTM)<sup>1</sup>. The following table shows the maximum error allowed. One sees that glass/mercury and electronic thermometers have the same requirements over the range of 96.4 - 106 F.

Thermometer Type	ASTM Procedure <sup>1</sup>	Maximum Error over Temperature Range Shown				
		< 96.4 F	96.4 < 98.0 F	98.0 -102.0 F	> 102 -106 F	>106F
Mercury in Glass	E667-861 (reapproved 1991)	+ 0.4	+ 0.3	+ 0.2	+ 0.3	+ 0.4
Electronic Thermometers	E1112-861 (reapproved 1991)	+ 0.5	+ 0.3	+ 0.2	+ 0.3	+ 0.5

It is important to note that many thermometers read out to a smaller division than the accuracy of the thermometer itself. For example, digital thermometers which read to 0.1 degrees F may be accurate only to + 0.2 F or less. If the accuracy is + 0.2 degrees F, the true temperature of a thermometer reading 98.9 F is in the range of 98.7 - 99.1 degrees Fahrenheit. Therefore when selecting a thermometer, one must look closely at the accuracy, rather than the smallest increment reported.

**2. Accuracy of glass/mercury thermometers** - Inherent in any discussion of alternatives is the assumption that glass/mercury thermometers are accurate. Data suggests that our faith in glass/mercury thermometers may be misplaced.

Leick-Rude and Bloom<sup>2</sup> describe a study in which axillary temperature in neonates was taken with non-mercury thermometers and compared with a "standard" of glass/mercury thermometers. For the purpose of the study, the accuracy of each glass/mercury thermometer was tested as a condition of accepting it for the study. 25% of the glass/mercury thermometers tested differed from the reference thermometer by >0.2 degrees Centigrade and were deemed unacceptable for use in the study. The authors cite another study in which 28% of glass/mercury thermometers were discarded because they differed by more than 0.1 degree Centigrade from the reference thermometer. The authors raise concern as to the accuracy of glass/mercury thermometers for general use, when one out of four of those tested was not deemed accurate enough. (In fact, the ASTM standard for glass/mercury medical thermometers specifies a maximum allowable error of + 0.1 C in the cited range).

**3. Favoring the old standard** - Chamberlain and Terndrup<sup>3</sup> remind us that "Whenever a new clinical test is introduced, investigators measure its accuracy by comparing it to an accepted standard, termed the 'gold standard'. Because of this comparison to the old standard, initial testing will, by definition, favor the old method, even if the new clinical test is a better test".

**4. Use of rectal, oral, or axillary readings as a reference for tympanic temperature** - The publication "The Clinical Utility of Ear Thermometers"<sup>4</sup> describes different methods and their limitations for measuring body temperature. It cites that the medically accepted "gold standard" for core temperature is pulmonary artery blood temperature. However this is an invasive technique, so rectal, oral, or axillary readings are often used as a crude estimate of body core temperature. Each site is reflective of a different blood supply, with separate rates of change with a rising or falling body temperature. Additionally, each site has variables unique to that site that influence the body temperature measured. The publication concludes that since each site provides its own characteristic temperature properties, comparing a tympanic temperature directly with oral, axillary, or rectal temperatures is inherently flawed.

The lesson here is that with an understanding of how tympanic thermometers work, they offer a safe, convenient alternative to oral, axillary, or rectal temperature measurement. Education is critical to satisfactory performance, and manufacturers are well prepared to advise and coach clinicians on the use of their products.

**5. Customer Satisfaction** - Numerous interviews with users of non-mercury thermometers provide convincing evidence that alternatives are viable and well-received in health care facilities.

### References:

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