

APPLICATION

NYU Langone Medical Center (NYULMC)

PURPOSE

- To eliminate the purchase and use of mercury-containing products and equipment where safe, effective, mercury-free alternatives exist within owned and leased NYULMC facilities, including fully-owned Faculty Group Practices.
- To ensure the proper inventorying, labeling, control, safe handling and disposal, and reporting of all mercury-containing products and equipment as to minimize their impact.
- To provide a reasonable timeline for removing mercury from owned and leased NYULMC facilities, including fully-owned Faculty Group Practices.
- To protect patients, staff, visitors, and the environment from unnecessary exposure to mercury.
- To support industry development of new, proven mercury-free alternatives for products and equipment typically found in healthcare settings.

POLICY AND GENERAL INFORMATION

1.0 Introduction

In an effort to protect personnel and the environment, it is the policy of NYULMC to eliminate the use of mercury-containing products and equipment where safe, effective alternatives exist. For the purposes of this policy, “elimination” of mercury means as close to complete elimination as can be achieved with current alternatives, but does not pertain to listed exempted items outlined in section 6.0 of this policy. The Mercury Elimination Program (the Program) requires that where no acceptable substitute is available, products containing mercury will be clearly labeled, inventoried, safely handled and properly disposed of with the goal of phasing out all remaining mercury-containing materials as new alternatives are identified.

2.0 Background

Mercury is a liquid metal that occurs naturally in the environment. Mercury also enters the environment from a large number of sources related to the use of the element and its compounds. Mercury is a persistent chemical that bioaccumulates in the food chain.

Humans can be exposed to mercury, e.g., by consumption of contaminated seafood or through direct exposure —through chemical handling, spills or equipment breakage.

Mercury is a potent neurotoxin that can impact the brain, kidneys, and lungs as well as the central nervous system at extremely low levels of exposure. According to the Centers for Disease Control and Prevention, one in eight women in the United States has blood mercury levels high enough to impact fetal development.¹ The National Academies of Science states that each year about 60,000 children may be born in the United States with neurological problems that could lead to poor school performance because of exposure to methylmercury in utero.² Preventing human exposure to mercury is an important public health priority.

In June 1998, the Environmental Protection Agency (EPA) and the American Hospital Association signed a Memorandum of Understanding which has as one of its stated goals the virtual elimination of mercury waste by the year 2005.

In 2013, the World Health Organization and Health Care without Harm launched the initiative Mercury-Free Healthcare by 2020, to mark the signing of the United Nations Minamata Convention on Mercury, calling for the worldwide phase out of mercury fever thermometers and blood pressure devices containing mercury. This will be done by ending the manufacture, import and export of these devices and by supporting the deployment of accurate, affordable, and safer non-mercury alternatives.

Healthcare facilities are known to contribute mercury to the environment through medical waste treatment technologies, wastewater and solid waste. There are a variety of sources of mercury and mercury-related compounds in hospitals. Certain types of medical equipment and devices contain mercury, including thermometers, sphygmomanometers (blood pressure devices), esophageal bougies and dilators, cantor or Miller-Abbott tubes and batteries. Mercury can be found in switches, relays, thermostats, fluorescent lamps, computer monitors and other facilities and operational equipment. Mercury is commonly found in lab and pharmacy equipment, such as thermostats and electron microscopes, and in chemical stains, fixatives and pharmaceutical formulations. The mercury-based preservative thimerosal is still used in certain drug and vaccination formulations though in very small quantities.

Mercury waste must be handled under the EPA's Resource Conservation and Recovery Act regulations. Due to the potential health hazards associated with mercury, proper

¹ US Centers for Disease Control and Prevention. 1999-2000 National Health and Nutrition Examination Survey (1999-2000 NHANES).

² National Academies of Science. EPA's Methylmercury Guideline Is Scientifically Justifiable For Protecting Most Americans, But Some May Be at Risk. July 1, 2000.

handling and disposal of mercury is critical to avoiding personnel exposure and environmental contamination.

3.0 **Scope**

This program applies to:

- All owned and leased NYULMC facilities and activities within those facilities
- All employees of NYU Hospitals Center, NYU School of Medicine, NYU Langone Health Systems, and their respective affiliates, including Faculty Group Practices. It also applies to individuals who perform the functions of employees, such as attending physicians and surgeons, students, and volunteers
- All third-party contractors and vendors

4.0 **Responsibilities**

4.1 **Corporate Officers and Vice Presidents** are responsible for providing resources and support for the development and implementation of the Program

4.2 **Department Chairs, Directors, and Administrators (including Hospital, School of Medicine, Faculty Group Practices, Clinical Laboratories and Pharmacies)** are responsible for:

- ensuring personnel within their areas of responsibility operate in accordance with the Program
- disseminating design and purchasing guidelines to their departments, and ensuring that procurement is conducted in accordance with the Program
- ensuring specifications for purchase of clinical instrumentation are in accordance with Clinical Engineering recommendations and requirements as they relate to the Program
- ensuring their departments maintain product codes, SKUs, and information for items containing or suspected of containing mercury
- ensuring that EH&S is informed immediately in the event of a mercury spill
- investigating and evaluating available mercury-free alternatives as needed
- ensuring staff receive appropriate training as needed

- 4.3 **Vice Presidents and Directors of Facilities Operations, Real Estate, and RED+F Design and Construction** are responsible for:
- ensuring that their departments, contractors, consultants, and vendors adhere to the requirements of the program
 - disseminating design and purchasing guidelines to their departments, and ensuring that procurement is conducted in accordance with the Program
 - ensuring that a copy of this policy is included and/or referenced with all contracts that apply
 - ensuring Facilities Operations and Real Estate maintain an inventory of mercury-containing products and equipment or is able to produce the required information for the Sustainability Manager for reporting as outlined in Section 8.0, including product codes, SKUs, and product information
 - ensuring that specifications for purchase are in accordance with Clinical Engineering recommendations and requirements as they relate to the Program
- 4.4 **Supply Chain Management** is responsible for:
- working with relevant departments and consultants in conjunction with the Group Purchasing Organization (GPO) and suppliers to advise, negotiate and purchase materials that meet the standards of the Program wherever possible, for purchases controlled by Supply Chain Management
 - responding to requests for purchasing information based on product information (manufacturer ID). However, it is not Supply Chain Management’s responsibility to keep track of product codes, SKUs or information for items containing or suspected of containing mercury (see section 4.2).
 - ensuring the department operates in accordance with the Program when pursuing contracts, supplier agreements and purchasing
- 4.5 **Clinical Engineering** is responsible for making recommendations on clinical devices in accordance with the Program and providing recommendations on alternatives as they enter the market
- 4.6 **The Sustainability Manager** is responsible for:
- developing and implementing the Program
 - training personnel on the requirements of the Program

- coordinating the inventory of mercury-containing products and equipment
- reviewing the Program annually and updating as needed
- assisting and advising personnel in implementing the Program through appropriate mercury elimination strategies
- compiling and reviewing the mercury inventory to inform goal setting, phase-out plans and additional support needed for implementation of the Program and reporting as part of yearly Practice Greenhealth Environmental Excellence award application and the Healthier Hospital Initiative reporting requirements

4.7 Environmental Health and Safety is responsible for:

- providing or coordinating mercury spill response and clean-up when departments are not equipped to do so independently
- arranging for proper disposal of mercury-containing products, equipment and chemicals as needed

5.0 Design and Purchasing Guidelines

- 5.1 Whenever possible, the use of products, equipment and chemicals containing mercury should be minimized and/or eliminated. Products and equipment that contain mercury shall be avoided where safe, effective, mercury-free alternatives exist. For a list of chemicals with potential to contain mercury, see Appendix A.
- 5.2 The main gateways or routes for mercury-containing products and equipment to enter the system include through 1) departmental procurement 2) Supply Chain Management 3) physician group practices 4) Pharmacy 5) Laboratories/Research and 6) RED+F and its contractors. These groups shall be the focus of this policy and held accountable for its dissemination, adherence and enforcement.
- 5.3 Clinical Engineering has eliminated use of mercury-containing products and equipment as part of its recommendation for clinical instrumentation in all NYULMC facilities, including off-site properties and fully-controlled Faculty Group Practices, and remains committed to this policy moving forward. It is the responsibility of Department Chairs, Directors, and Administrators, Vice Presidents and Directors of Facilities, Real Estate, RED+F Design and Construction to make sure all specifications for purchase of clinical instrumentation are in accordance with Clinical Engineering recommendations and requirements.

- 5.4 RED+F developed a set of Design Guidelines that specifically call for elimination of use of products and equipment containing mercury and identified alternatives where available. Designers and contractors contractual requirements include compliance with the official RED+F Design Guidelines.
- 5.5 All staff members that develop specifications for purchasing shall adhere to the Program and seek out new mercury-free alternatives if none are outlined in Appendix B, particularly for pharmaceutical and laboratory products. Additional resources for finding new mercury-free alternatives include:
- NYULMC's Group Purchasing Organization (Premier, GNYHA, tool spend advisor)
 - Clinical Engineering
 - Supply Chain Management department staff and consultants
 - Practice Greenhealth
 - Health Care Without Harm and the World Health Organization (<http://www.mercuryfreehealthcare.org/>)
 - U.S. Green Building Council
 - NYULMC contractors, architects and vendors

6.0 Exemptions

Some mercury-containing products, equipment and chemicals are exempt from the Program. Exemptions include UV, florescent and LED light bulbs, ballasts and mercury-containing batteries. These items shall be recycled as universal waste in accordance with *Safety Policy 108c: Universal Waste Management Program*. No bulbs are permitted to be crushed for any reason.

Mercury-containing pharmacy products are permitted if no safe, effective alternative exists. Mercury-containing chemicals in laboratories are permitted as long as they are labeled appropriately according to *Safety Policy 134: Chemical Hygiene Plan* and comply with NYULMC's chemical minimization strategy. Laboratories shall avoid usage of mercury-containing staining solutions, reagents and fixatives when not necessary or when suitable alternatives are available. Mercury-containing products and equipment in laboratories are not exempt from the Program.

7.0 Guidelines for use of mercury-containing products and equipment with no adequate substitute

Where no acceptable substitute is available, or the alternative is not adequate for intended use, products and equipment containing mercury shall be clearly inventoried, labeled,

handled, and disposed in accordance with this Program, RED+F Design Guidelines, and NYULMC safety policies, in particular *Safety Policy 108c: Universal Waste Management Program*. Any mercury-containing products or equipment that cannot be eliminated shall be managed through the following practices:

- 7.1 **Minimization:** Mercury-containing products, equipment and chemicals that cannot be eliminated shall be minimized to the extent feasible. NYULMC's chemical minimization strategy encourages laboratories and users to:
- purchase only what is needed
 - purchase chemicals in the smallest quantities possible to meet needs (small containers)
 - conduct micro experiments instead of large-scale experiments to minimize volume of chemicals needed at any given time
 - avoid volume purchasing that would result in stockpiling of chemicals
- 7.2 **Labeling:** Mercury-containing products, equipment or chemicals shall be physically labeled as mercury-containing. Light bulbs/lamps, ballasts, and batteries do not need to be labeled. Appropriate labels can be obtained from Facilities Operations office (Greenberg Hall, SC2-122).
- Mercury-containing chemicals must be labeled in accordance with *Safety Policy 134: Chemical Hygiene Program*.
- 7.3 **Safety Data Sheets (SDSs):** SDSs for any mercury-containing products and equipment shall be readily available.
- 7.4 **Documentation and Inventory:** Documentation of all existing and permitted mercury-containing products, equipment and chemicals shall be readily available. The inventory shall be maintained by the Sustainability Manager. See Section 9.0.
- Laboratories must include mercury-containing chemicals in the lab's chemical inventory.
- 7.5 **Waste Handling:** When replacing or disposing of mercury-containing products and equipment, they can often be recycled as universal waste. Some examples of mercury-containing items that can be recycled as universal waste include:
- mercury-containing light bulbs and ballasts (UV, florescent and LED)
 - switches

- thermostats
- thermometers
- barometers
- other meters or gauges
- batteries (e.g., mercuric oxide)

Mercury-containing products and equipment waste must be handled so as to minimize the potential for spills, leaks, and breakage. If items are broken or leaking, they can no longer be recycled as universal waste and must be managed as hazardous waste. EH&S shall be contacted to arrange for disposal of universal and hazardous waste.

Dental Practices shall utilize amalgam separators for proper collection and recycling of elemental mercury as per the NY Dental Mercury & Amalgam Recycling Law of 2002.

For more information, see the following policies:

- Safety Policy 107: Disposal of Computers and Electronic Equipment
- Safety Policy 108: Chemical Waste Minimization and Disposal Program
- Safety Policy 108a: Hazardous Waste from Contractors (Construction & Building Maintenance)
- Safety Policy 108c: Universal Waste Management Program

7.6 **Spill Response:** In the event of a mercury spill, the area shall be secured and EH&S shall be contacted immediately.

- If a mercury spill clean-up kit is available and the spill is from a thermometer, staff may use the kit to clean the spill. Staff should have received training on the use of the mercury spill clean-up kit.
- If the spill is from a barometer, if no kit is available, or if there are any other safety concerns, consult with EH&S for guidance.

8.0 Training

8.1 The Sustainability Manager shall provide personnel with training on the program.

8.2 Chemical hygiene and hazardous waste training is available for those who work with hazardous chemicals and products like mercury. See *Safety Policy 121: Hazard Communication Program* or contact EH&S for more information.

- 8.3 Staff who routinely produce or handle universal waste shall be provided with Universal Waste Training. See *Safety Policy 108c: Universal Waste Management Program*.
- 8.4 The Director of each department/departmental subunit is responsible for ensuring that departmental employees receive information and training on mercury stored or used within the department/departmental subunit, as well as information on the Mercury Elimination Program. EH&S can be contacted for guidance.

9.0 Program Evaluation and Annual Reporting

- 9.1 In order to evaluate the progress of the Program within different departments and locations at NYULMC and identify areas in need of increased education and intervention, the Sustainability Manager shall compile the following information annually from departments using mercury-containing products, equipment and chemicals, such as clinical departments, laboratories, RED+F and Faculty Group Practices. Information on exempt items as specified in section 6.0 does not need to be collected.
- inventory with exact location specified of stationary/fixed mercury-containing products and equipment, including clinical devices and building materials
 - records of any mercury-containing products and equipment that have been removed permanently in the prior 12 months
 - purchasing records of known mercury-containing materials or equipment for annual procurement estimates and identification of product categories for which alternatives still need to be identified
 - modified or newly implemented plans for elimination and timelines for elimination of existing mercury-containing materials that have acceptable alternatives
- 9.2 The Sustainability Manager shall report necessary components of the above information to Practice Greenhealth, the Healthier Hospital Initiative, and any additional sustainability initiatives as relevant.

Related policies:

Safety Policy 107: Disposal of Computers and Electronic Equipment

Safety Policy 108: Chemical Waste Minimization and Disposal Program

Safety Policy 108a: Hazardous Waste from Contractors (Construction & Building Maintenance)

Safety Policy 108c: Universal Waste Management Program

Appendix A	Mercury-Containing Laboratory Chemicals Purchase Reference
Appendix B	Mercury-free Products Approved for Purchase

Issue date	08/2016
Replaces	11/2015
Reviewed by	L. Ahlborn, Office of Science and Research E. Cohen, Clinical Ambulatory Operations, Faculty Group Practice R. Cohen, Facilities Operations A. DeBoer, Logistics and Distribution J. Goldberg, Environmental Health and Safety R. Kishun, Clinical Engineering D. Rubbo, HJD Engineering R. Stevens, Real Estate J. Willi, Supply Chain Operations NYUHC Environment of Care Committee

Summary of Revisions

Revisions date	Section	Changes
August 2016	7.5	Clarifies waste handling
	7.6	Clarifies spill response

Mercury-Containing Laboratory Chemicals Purchase Reference

The following is a list of laboratory chemicals and mixtures that may contain mercury. This list should not be assumed to be complete. Request that vendors disclose mercury concentration on a Certificate of Analysis for all chemicals purchased. Purchase alternatives where they exist, otherwise follow the on the Program's use guidelines (Section 7.0).

- Acetic acid
- Ammonium reagent/Stone analysis kit
- Antibody test kits
- Antigens
- Antiserums
- Buffers
- Calibration kits
- Calibrators
- Chloride
- Diluents
- Enzyme Immunoassay test kits
- Enzyme tracers
- Ethanol
- Extraction enzymes
- Fixatives
- Hematology reagents
- Hormones
- Immunoelectrophoresis reagents
- Immunofixationphoresis reagents
- Immu-sal
- Liquid substrate concentrate
- Negative control kits
- Phenobarbital reagent
- Phenytoin reagent
- Positive control kits
- Potassium hydroxide
- Pregnancy test kits
- Rabbit serum
- Shigella bacteria
- Sodium hypochlorite
- Stains
- Standards
- Sulfuric acid
- Thimerosal
- Tracer kits
- Urine analysis reagents
- Wash solutions

Mercury-free Products Approved for Purchase

Material or Instrument	Accepted Mercury-free Product/Brands/Alternatives
Thermometers	Enviro-Safe digital thermometers
Sphygmomanometers	Welsh Allyn 767 Wall and Mobile Aneroids
Gastrointestinal Equipment	Tungsten-filled bougies, TTS balloons, Wire-guided polyvinyl dilators (Savary)
Lamps/Bulbs	Such as UV/LED/CFL are allowed, but must follow NYULMC's policy for Universal Waste recycling. No bulbs are permitted to be crushed for any reason
Batteries	Are allowed, but must follow NYULMC's policy for Universal Waste recycling
Float Controls	Mercury-free alternatives as designated in Engineering Design Guidelines
Thermostats	Electronic thermostats as designated in Engineering Design Guidelines
Pressure Gauges	Electronic alternatives as designated in Engineering Design Guidelines
B5 fixative	Not in use, Zinc alternatives where appropriate
Zenker's Solution	Not in use, Zinc alternatives where appropriate