



Mercury Minimization at Medical Facilities

Background

Hospitals and other healthcare and medical facilities use a variety of products that contain mercury, such as thermometers, blood pressure cuffs, fluorescent bulbs, batteries, laboratory chemicals and many cleaning products. The use of these mercury-containing items creates many pathways by which mercury may be released into the environment. The following are the three primary pathways:

- Releases of mercury into the air by medical waste incinerators burning medical waste containing the chemical
- The landfilling of mercury-containing medical waste
- Releases of the chemical into the wastewater stream

Improper handling and disposal of mercury are common occurrences within hospitals and other medical facilities. Once mercury is spilled, disposed of as solid waste or discharged to the receiving wastewater plant, the avenues into the environment are opened. Mercury is very mobile and persistent; it can easily make its way into the atmosphere, soil, groundwater and surface waters of local, regional and more distant areas. As a result, traditional methods of waste disposal are inadequate to deal with the problems associated with mercury use. Even mercury “captured” by costly air pollution control devices can make its way back to the atmosphere. Consequently, there is a need for a different approach when it comes to dealing with mercury and other deadly toxins.

History

In 1990, Congress passed the Pollution Prevention Act. This marked the beginning of source reduction as a national policy. In passing the Act, Congress recognized the benefits of source reduction versus waste treatment and disposal. According to the Pollution Prevention Act, pollution prevention is any practice that reduces the use or generation of hazardous substances prior to recycling, storage, treatment or control. While recycling is a form of waste minimization that can reduce the volume of waste requiring disposal, it is *not* source reduction. Source reduction reduces and eliminates toxic substances such as mercury at the source. This approach is much better than addressing problems after they have been created through spills, improper transport handling and inadequate disposal and pollution control methods. It also allows facilities to avoid the costs associated with expensive pollution control equipment, regulatory fines and potential legal battles.

In October of 2012, the EPA approved a North Carolina total maximum daily load for mercury discharged to waters of the state. As a result, municipalities and local governments were required to draft and implement Mercury Minimization Plans, outlining best management practices (BMP). The primary BMP for the City of Clinton Pretreatment Program is **source reduction**.

The benefits of source reduction have become apparent to many of the industries targeted by this legislation, including the healthcare sector. Pollution prevention is a logical, cost-effective and feasible approach to eliminating mercury pollution from healthcare sources.

Reduction Methods

In the Pollution Prevention Act, Congress identifies the following five source reduction methods:

1. Substitution of raw materials
2. Reformulation or design of products
3. Equipment or technology modifications
4. Process or procedure modifications
5. Improvements in housekeeping, maintenance, training, or inventory control (operational changes)

Medical facilities can employ most of these methods via best management practices, to reduce the amounts of mercury used in their facilities. Examples include the following:

- ✓ Creating and enforcing agreements with vendors to supply only mercury-free products as a means of controlling inventory and being environmentally responsible at the same time
- ✓ Using mercury-free thermometers as an equipment change that lowers the risk of mercury entering the environment
- ✓ Encouraging the use of mercury-free lab reagents as a process change that can bring the same diagnostic results yet be safer for the environment
- ✓ Using mercury-free cleaning products
- ✓ Checking lab coats and other work clothes for instruments or items containing mercury prior to washing
- ✓ Using alternative low-cost lighting which does not contain mercury
- ✓ Utilizing rechargeable batteries
- ✓ Reduce or cease the use of cleaning with oxidizing or acidic cleaners, including but not limited to bleach, chlorine, iodine and peroxide outside of pH range of 6-8 standard units. These cleaners dissolve mercury, and expose free mercury to the environment.

Pollution prevention is a sound alternative to other forms of waste treatment and disposal, which are inadequate to deal with the problems associated with mercury use. Besides the obvious benefits highlighted, source reduction also goes a step further. It produces significant changes in behavior that often precede similarly significant changes in attitude. Once administrators and staff become involved in mercury pollution prevention, the importance of keeping mercury and other toxins out of their facilities and, consequently, the environment will become reinforced. In the future, instead of approaching the problem of pollution reactively, they will be inspired to take a proactive stance to new challenges.

Additional Resources

The EPA's mercury information web page: <https://www.epa.gov/mercury>

The North Carolina Department of Environmental Quality's (NCDEQ) mercury information web page: <https://deq.nc.gov/about/divisions/water-resources/water-resources-permit-guidance/pretreatment-guide/mercury-guidance>

NCDEQ's mercury limits information web page:

<http://www.conservation.nc.gov/web/wq/ps/mtu/tmdl/tmdls/mercury>

The Agency for Toxic Substances and Disease Registry mercury information web page:

<https://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=113&tid=24>

NCDEQ's mercury bulb recycling information web page:

<https://deq.nc.gov/conservation/recycling/fluorescent-lights/recycling-options>

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