



Medical Waste Disposal Definitive Guide

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Before you hire a medical waste disposal company read this and avoid the mistakes of locking into a multi-year contract with the wrong company, which could cost you years of paying up to 83.6% more, unreliable and inconsistent pick-ups, and OSHA or HIPPA trouble from an amateur hauler.

As a Medical Doctor (MD) and expert in medical waste disposal, I created this "Definitive Guide" to answer all your questions about: drop-off (near you), top companies, containers, costs, treatment methods, regulation, facility, and problems.



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Let's Dive In



What Is Medical Waste?

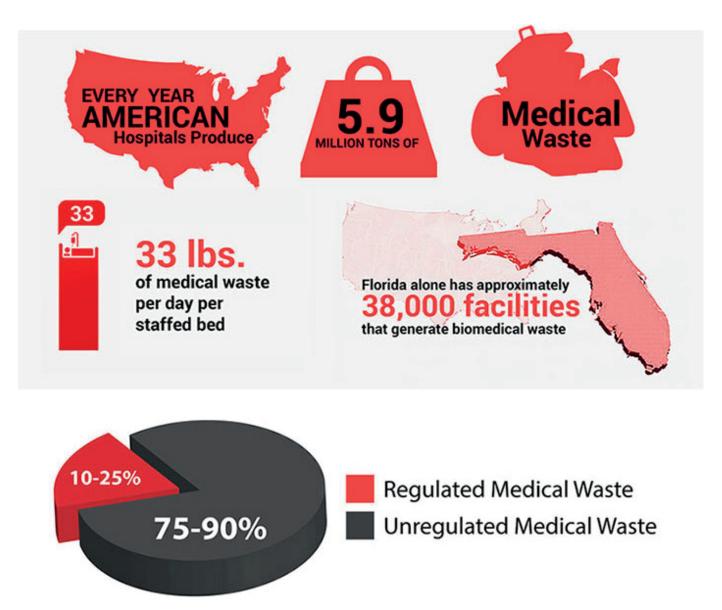


According to the EPA (Environmental Protection Agency), the definition of medical waste is fairly broad "all waste materials generated at health care facilities, such as hospitals, clinics, physician's offices, dental practices, blood banks, and veterinary hospitals/clinics, as well as medical research facilities and laboratories."

It fails to include any organization that produces medical waste such as syringes or needles from their employees or customers, or the home producer for that matter.



How Much Medical Waste Is Produced?



In 2012, the United States spent up to \$2.5 billion for the proper disposal of medical waste. Moreover, with annual growth of 4.8%, by 2017 the annual market is expected to \$3.2 billion. For instance, consider these medical waste statistics:

- Just hospitals in the U.S. produce more than 5.9 million tons of waste annually
- Hospitals produce 33 lbs.of medical waste per day per staffed bed
- Florida alone has approximately 38,000 facilities that generate biomedical waste

In short, almost all healthcare activities related to humans produce medical waste. So, can you imagine the dangers of what would happen if it was disposed of improperly?



The Epidemiology

How Often Diseases Occur in Different Groups of People and Why



WHO (World Health Organization) even mentioned that in 2000, there were 32% new Hepatitis B infections due to improper way of contaminated syringe disposal.

In 2002, WHO conducted a research study to review 22 countries and their methods of medical waste disposal management and results showed various ranges from 18% up to 64% used **improper methods** of biomedical waste management.



Who Are At Risk For Biomedical Waste Exposure?



People who have the highest risk of being the biomedical waste, for instance, healthcare workers, patients, waste collection and disposal staff, and even our environment. The biomedical waste may pose an occupational hazard when managed incorrectly. Therefore, we need special precautions and the well-trained personnel to manage those biomedical wastes and keep the risk low.



Why We Need To Manage The Biomedical **Waste In The Right Way?**

There are several reasons to manage the biomedical waste in an appropriate way:



Health

Nobody wants to see blood drops on the floor when they walk into hospital visiting a sick friend because the risk of being infected by any number of diseases



Infection risk

the risk of infection obtained from sharp injuries can lead to infection



Environment pollution

The risk of air, water and soil pollution directly from waste due to defective incineration or autoclaving can be harmful.

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In 2002, WHO conducted a research study to review 22 countries and their methods of medical waste disposal management and results showed various ranges from 18% up to 64% used improper methods of biomedical waste management.



Manage The Biomedical Waste Right Now!

The biomedical waste treatment and disposal need to be completely managed to ensure the safety of the workplace and maintain our health.

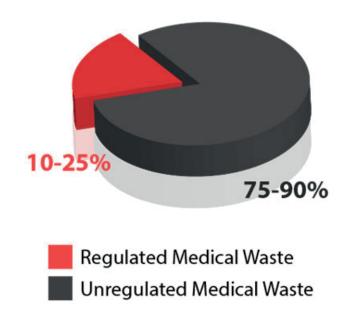
- **Effectively reduce your legal liability**
- Reducing the danger to the community, personnel and patients
- Keep your reputation high



The OSHA (Occupational Safety and Health Administration) has an established procedure for dealing with biomedical waste hazards that can minimize our risk with contaminated articles. Thus, we at BioMedical Waste Solutions, LLC, use OHSA standards as our guidance to dispose the medical waste properly.



Regulated VS Unregulated



BioMedicalWasteDisposal.com/Medical-Waste-Disposal/

Of all the health care waste (HCW) there is essentially two types: Regulated medical waste (RMW) and unregulated medical waste (UMW). Approximately 75% to 90% of HCW is UMW (unregulated) or known as healthcare general waste (HCGW). This waste is similar to typical household waste consisting of papers and plastics that are not been in contact with patients and is categorized as non-infectious. This type of waste is simply disposed in accordance with municipal regulations. Approximately only 10% to 25% of HCW is infectious/regulated medical waste (RMW).

Naturally this RMW has to be handled with special care as we'll describe below because it could pose a threat to the health of others, either by contaminating the environment or through direct contact with an individual. Easier way to differentiate the two types is to ask yourself "could this waste kill someone or make them sick?" If yes, then this waste is regulated and must be handled with special care.

NOTE: The use of "medical waste" will be regarded as "regulated medical waste" (RMW), unless otherwise stated.



Eight Categories of Medical Waste

It's important to know what kind of medical waste your facility produces then you can determine the proper disposal. The WHO classified the medical waste into eight (8) categories of medical waste:

Infectious waste

Waste that may transmit infection from virus, bacterial, parasites to human, i.e.: lab cultures, tissues, swabs, equipment and excreta

- Sharps
 - Sharp waste, such as needle, scalpels, knives, blades, etc.
- Pathological
 - Human tissue or fluids i.e. body parts, blood, other body fluids
- / Radioactive

Unused liquid in radiotherapy or lab research, contaminated glassware, etc.

- **Chemical**
 - **Expired lab reagents, film developer, disinfectant**
- **Pharmaceuticals**
 - **Expired and contaminated medicines**
- **Pressurized containers**

Gas cylinders and gas cartridges

○ General waste (UMW)

No risk to human health because no blood or any related bodily fluid, i.e.: office paper, wrapper, kitchen waste, general sweeping, etc.

Because the management for every waste categories are different.



Medical Waste Disposal Drop-Offs (Near You!)

Is the disposal for a residence or an organization?

For Residences

Depending on where you live, it may be possible to take your sharps and medical waste disposal for drop-off at specific collection sites or medical waste facilities. A few of these services are free but most have a nominal fee.

It's important to check for information specific to your state, as **almost every state** and local government has its own regulations and guidelines to provide the best way to dispose of it.

In general, there are two important steps to prepare your medical waste disposal for drop-off:

Ensure your sharps containers disposal containers are labeled correctly

Secure the lid of the disposal container in the appropriate manner per local guidelines

For the reasons mentioned above, it is almost always recommended to use an external pick up service for your medical waste disposal. Medical waste disposal drop-off can be time-consuming, confusing, and even more expensive than using an external company for easy, stress-free pick up disposal service.

For Organizations

Considering the numerous federal and Statewide regulations for medical waste disposal, it's incredibly important for an organization to select a professional medical waste disposal company to deal with their medical waste disposal.

What are the medical waste disposal top companies?

Check out our suggestions below.



Medical Waste Disposal Top Companies

Are you looking for the medical waste disposal top companies? Look no further. We're it. We're affordable, reliable, and 100% compliant. We know that medical waste disposal can be tedious and complicated.

Our job is to provide you with the highest quality medical waste disposal so you remain completely in regulation with medical waste—on both the federal and local levels.

Low-Cost, Reliable, & Compliant Medical Waste Disposal. Relax while we take care of your medical waste disposal, so you'll never have to worry about it again!



Low Cost

Keep costs low with actual fixed rates and no hidden fees. The average organization **saves up to 83.6**% with us versus Stericycle.



Reliable

In just 14 years, we've grown to over 10,000+ happy clients because we virtually **guarantee timely and reliable pick-ups.**



Compliant

Compliance with State and Federal laws governing the proper disposal of medical waste is not a choice. It is the law.

We have you 100% covered.

Request a Quote in 10 Seconds!

Request a Quote Now

Or Call Us at 1 (844) 552-4900



Medical Waste Disposal Containers:

Cataloging, Colors, Size, & Types

Organizations that generate medical waste must ensure they take care of all disposals using the appropriate medical waste disposal containers. The role of these containers is to safely store materials until they are removed from the site location. To be secure, containers must be tough against holes and leaks, sturdy, and fire-resistant. It is crucial that staff members are properly trained so that medical waste disposal containers are used correctly and adhere to workplace health & safety laws.

Red Sharps Container Red Container or Red Yellow Container Liner in Container √ Infectious Waste √ Needles √ Empty vials, ampules √ Ampules √ Blood Products (albumin.etc) √ Empty Syringes, Needles √ Broken Glass √ Contamminated Personal √ Empty IVs √ Blades Protective Equipment (PPE) √ Gowns √ Gloves √ Razors √ IV Tubing √ Cultures, Stacks √ Staples √ Tubing √ Aprans √ Trocars √ Guide Wires √ Wipes √ Other Sharps √ Packaging **Black Container** Blue Container Shielded Containers with Radioactive Symbol √ Hazardous meds (RCRA) √ Pills √ Fluorine-18 (F-18). 110 minutes half-life. √ Half/Partial doses (RCRA) √ Injectables √ Technetium-99 (T-99m). 6 hours half-life. √ Hazardous bulk meds √ Antibiotics √ lodine-131 (I-131). 8 days half-life. √ P-listed drugs, packaging √ Strontium-89 (Sr-89). 52 days half-life. √ Bulk chemo √ Iridium-192 (Ir-192), 74 days half-life. √ Pathological Waste (Incineration Only) √ Cobalt-60 (Co-60). 53 years half-life.



Container Cataloging

The United States requires that waste containers be color-coded (colored images below). OSHA's **Bloodborne Pathogen Standard** [LINK this] states that workers should recognize that medical waste disposal containers need to be compliant with "Universal Precautions".

Even if your state doesn't adhere to color requirements, it is our recommendation that your organization does so to ensure OSHA and federal compliance.

Codes for Colors

These are the most commonly used color codes in the United States:



BLUE

Used for non-RCRA pharmaceutical wastes such as antibiotics.



YELLOW

Normally used for containers that hold chemotherapy waste.



Federally regulated color used in medical waste disposal containers holding biohazardous waste. This is also used for sharps containers.



BLACK

Used for RCRA regulated hazardous materials such as Warfarin, Nicotine patches, or gum.

Container Sizes and Types

Medical waste disposal containers most typically are stand-alone baskets, but wheeled carts and mounted receptacles are also easy to find. Sizes range anywhere from 1 quart to 20 gallons of capacity, but most commonly are 8, 12, and 18 gallons.



Medical Waste Disposal Costs



How does an organization decide whether to manage medical waste disposal in-house (by purchasing machinery) or have an external company take care of disposal?

Purchasing machinery, such as incinerators and autoclaves, can often appear to cost less per lb of waste disposal. However, the medical waste disposal costs of these capital expenditures are usually far out of reach for medium-sized clinics and medical centers.

It is important to consider the additional costs of operating this machinery, which include:

Maintenance costs

(scheduled maintenance work by an authorized technician)

Replacement parts costs

Utility costs

Training costs for employee use

As an example, steam sterilizers utilize water, steam, and electricity to operate. These costs can add up fast over the course of 20 years. Just the water costs to operate the autoclave can amount to over \$100,000!

One of our customers, a hospital, previously had a large on-site autoclave machine onsite which they poured thousands of dollars into for maintenance and replacement parts. They called us when it became obvious that these operating costs far exceeded the cost of using an external disposal company.

Medical waste disposal costs for pick-up vary greatly from state to state and also based on your volume and frequency.

Our cost is up to 83.6% more affordable than Stericycle (America's largest medical waste management company).



Medical Waste Disposal Treatment Methods

Incineration is the most commonly used medical waste disposal treatment. Recently, alternative treatment methods are becoming increasingly popular. Choosing a treatment system should be done carefully, on the basis of various factors, many of which depend on local conditions.

Here is a summary of the 5 most common medical waste disposal treatment methods:

Incineration.

A high-temperature dry oxidation process that reduces waste to inorganic, incombustible matter, and results in a very significant reduction of waste volume and weight. This process is usually selected to treat wastes that cannot be recycled, reused, or disposed of in a landfill site.

Wet and dry thermal treatment.

A treatment procedure based on the exposure of shredded infectious waste to high-temperature, high-pressure steam, and is similar to the autoclave sterilization process. With sufficient temperature and contact time are sufficient, it inactivates most types of microorganisms.

Irradiative (microwave irradiation).

A treatment method where waste is shredded, then humidified and transferred to an irradiation chamber equipped with a series of microwave generators. After irradiation, the waste is compacted inside a container and enters the municipal waste stream

Chemical disinfection.

Used routinely in health care to kill microorganisms on medical equipment and on floors and walls, is now being extended to the treatment of health-care waste. Chemicals are added to waste to kill or inactivate the pathogens it contains, usually resulting in disinfection rather than sterilization.

Land disposal.

If a municipality lacks the means to treat wastes before disposal, the use of a municipal land disposal site has to be regarded as an acceptable disposal route.



Brief History of Regulated Biohazardous Waste Disposal in America

In 1988, a famous act namely Medical Waste Tracking Act (MWTA) was addressed to handle the disposal of medical waste in coastal areas due to numerous medical and household waste throughout several coastal areas, therefore a two-year program was implemented in the affected areas (New York, New Jersey, Connecticut, Rhode Island, and Puerto Rico). This act was expired in June 21, 1991.

During that time, EPA gathered all information and performed medical waste related studies and together with MWTA, they managed to look at several treatment technologies that was available at that time involving incinerators, microwave units, and several varieties of mechanical and chemical systems that can be used for reducing the waste. Thus, resulting a different local regulation of medical waste management that was implemented to each state, such as Medical Waste Management 2015, as one of the recent medical waste regulation for California State.



Sorry to disappoint our Walking Dead fans, but improper disposal of medical won't be the cause of the Zombie Apocalypse in America because stringent regulations, laws, and guidelines.



Medical Waste Disposal Regulations

Federal agencies that regulate medical waste include the EPA, the Occupational Safety and Health Administration, and the U.S. Department of Transportation. The Centers for Disease Control and Prevention provides guidance, but not regulation.

Currently, Federal law doesn't provide a clear definition of medical waste. Usually, individual state health departments create medical waste disposal regulations to identify which wastes require special management and disposal processes.

Medical waste disposal regulations by State

Most of the 50 states have some form of medical waste disposal regulations in place. Unlike hazardous waste regulations, which are all based on the federal Resource Conservation and Recovery Act (RCRA) standards, the medical waste disposal regulations by state vary a great deal.

Generally, the state EPA holds the prime responsibility for developing and regulating medical waste disposal practices. However, in some states (e.g. Missouri and Oklahoma) the department of health plays a leading role or serves as a primary regulatory agency (e.g. Colorado). Often the department of health is responsible for onsite management and an environmental agency takes care of transportation and disposal.

The majority of states have regulations for packaging, storage, and transportation of medical waste. Others require health care facilities to register and obtain a permit for waste.



Where does medical waste go? How is medical waste disposed of? For purposes of this guide, we are going to focus on disposal in the US. Let's share with you the cautious and special care process in which medical waste is collected, stored, transported and treated with.

Stage 1 - Collecting & Segregating

The biomedical waste has to be collected in containers that are resilient and strong from breakage during the handling process. Do not place sharps, used needles, syringes, or other contaminated tools in common waste disposal or recycle bin because the entire waste will be infectious by doing so. The segregation also needs to be performed between the liquid and solid biomedical waste products. Categorizing the medical waste with correct segregation to isolate and manage each waste in the proper way. For this purpose, the segregations come in colored waste containers, label coding and plastic bags.

Stage 2 – Storing & Transporting

Specific requirements for storage facilities, such as a secure area that is inaccessible to the general public, as well as separated it from areas for food consumption. The storage facilities also have to be accompanied with refrigerator or freezer unit that can be used with medical waste if necessary. Some facilities even provided special vehicles and protective devices to dispose, handling or transport the biomedical waste products. Remember to observe and keep maintaining the protective devices periodically so it won't be a source of transmitting the infections.



Stage 3 - Treatment

The needs of professional handling that work according the by-law regulation such as the OSHA are needed to ensure that the regulated medical waste (RMW) is handled properly. The treatment process will use several medical waste equipment that ranged from handling, carts, shredding, conveying, size reducing, compactors, to sterilization or recycling. The following equipment is needed to properly process the waste in order to reduce the hazards, and maintain the environment:

Carts and containers

Commonly used to collect the medical waste i.e. dumpers, containers, compactors can be used to collect the medical waste

Conveyors

This equipment help to segregate the waste

Sterilizers

Such as: autoclave, shredder, and size redactor

Handling the waste

Such as: compactors, containers, pre-crushers, and deliquefying system

Recycling system

I.e. balers and size reduction equipment



Incineration – Type 1 of Medical Waste Treatment

The incineration technology used a high temperature thermal process that can convert inert material and gases with the combustion process. It will process the waste to convert into ash, gas, and heat. There are three types of incinerators that are commonly used for biomedical waste:

The Multiple Hearth Type

It has a circular steel furnace that contains solid refractory hearths with a central rotating shaft to convert the waste into ash

Rotary Kiln

It is an incinerator, shape like a drum, commonly for medical and hazardous waste

Controlled Air

There are two process chambers that will handle the waste. The complete combustion and oxidizing it, leading to a stream of gas with carbon dioxide and water vapor composition. It is commonly used for waste that has organic materials.

In addition, for some cases, performing a shredding for biomedical waste needed as an aid for incineration process.



Non-Incineration System (Autoclaving, Irradiation, Chemical Methods) – Type 2 of Medical Waste Treatment

Aside from the incineration technology, the non-incineration method also provided to dispose the biomedical waste, it contains four basic processes such as thermal, thermal, thermal, thermal, thermal, themical, and biological.

The autoclaving system (a photo of our autoclave machine is below) is commonly used for the human body fluid waste, sharps, and microbiology laboratory waste. This system requires high temperature (thermal) that produces steam to decontaminate the biomedical waste. The steam plays a critical role in the medical waste autoclaving process therefore a good waste holding container is required. While most of human body fluid waste can use this method, but the cytotoxic agents that used for chemotherapy cannot use this method due to those types of waste are not degraded with autoclave steams. Beside autoclaving, irradiation is the other thermal method which uses a high frequency microwave for disposal. The wave will generate heat to the waste materials and kill all the bacteria, or any other contamination in the tools.



Another way of performing treatments for biomedical waste is chemical decontamination, this method can be used for microbiology laboratory waste, human blood, sharps and body fluid waste, but cannot be used for treating anatomical waste. Aside from that, biological processes is a method that employ enzymes to destroy the organic matter of the waste, however there are very few non-incineration technologies have been based on this biological method.



On-Site and Off-Site Treatment of Medical Waste

To differentiate which biomedical waste that can be performed on-site and off-site is important. Because in majority of the cases, the biomedical waste is a mixture and can be very difficult to manage it properly or even to segregate it, which is why an accurate simplified management of medical waste in segregating it according to the regulations will reduce the erroneous element. The on-site treatment usually requires expensive equipment. Not all facilities have this due to major infrastructure expenditure, but it is generally cost effective for very large hospitals and laboratories.

Thus most medical waste producers choose off-site treatment known as regulated medical waste disposal companies because these companies have:

The proper medical waste equipment

Been state certified operating permits

OSHA-trained personnel to collect, transport or store the medical waste

Once treated, the medical waste can be disposed of.



Stage 4 - Disposal

In the US, for solid waste, once medical waste producers have adhered to regulations for collecting, storing, transporting, and treating their waste, they may then use their municipal landfill and sanitary sewer system as their final disposal method.

That's right, your local municipal landfill is commonly used as the final place of your treated decontaminated biomedical waste.

For fluids such as blood, suctioned fluids, excretions and secretions, **almost every state and local government** has its own regulations and guidelines to provide the best way to dispose it. In general, there are two recommended ways to handle medical waste fluids:

Collect fluids in a leak proof container, and solidified for autoclave treatment

Thermally (autoclave) fluids then they be disposed into the sanitary sewer system

An extra precaution should be performed before pouring treated fluids in sewer because they may clog and leak.



Medical Waste Disposal Facilities



Hazardous and medical waste disposal facilities receive waste for treatment, storage or disposal. These locations are usually referred to as TSDFs (treatment, storage, and disposal facilities).

Treatment Facilities

Use several different processes, such as incineration or oxidation, to alter the composition of medical wastes. Some treatment processes allow waste to be recovered and reused for manufacturing, while other treatment methods dramatically reduce the amount of hazardous waste.

Storage Facilities

Temporarily hold hazardous and medical wastes until they are treated or disposed of. Medical waste is often stored prior to treatment or disposal, and needs to be stored in containers, containment buildings, tanks, drip pads, surface impoundments, or waste piles that comply with the Resource Conservation and Recovery Act (RCRA) regulations.

Disposal Facilities

Are permanent locations where hazardous and medical wastes are stores. The most common types of disposal facilities are landfills, where waste is disposed of in constructed units designed to protect groundwater and surface water resources.



Medical Waste Disposal Problems

The most common medical waste disposal problems arise when proper disposal procedures are not followed. Improper disposal can lead to serious consequences, putting facility staff, patients, and communities in danger. Not to mention fines, lawsuits, and the loss of reputation that could ruin your business. That is why it's crucial to pick the right company to help with your medical waste removal. Here are some of the biggest problems with the disposal of medical waste.

Lack of Training for Staff

Many facilities fail to fully train all staff on procedures and best practices for medical waste disposal. This leads to medical waste disposal problems such as waste being placed in the wrong containers, or hazardous materials being flushed down a drain, or thrown in the regular trash.

Every facility with medical waste should be inspected at regular intervals to ensure proper procedures and training are in place.

Improper or Illegal Dumping of Medical Waste

Some facilities can generate up a tonne of medical waste each and every day. Illegal dumping of waste could potentially expose many people to infections and diseases. Disposing of medical waste via burning is also a dangerous solution, as toxins from waste can circulate in the air. Simply throwing medical waste into the regular trash can also be dangerous for any janitors and the general public. Illegal dumping of medical waste can result in huge fines.

The best way to avoid most medical waste disposal problems is to hire a reputable medical waste disposal company, like us, to handle your medical waste and ensure you remain compliant.



Conclusion

As you can see from this article, great care goes into disposing of medical waste, and the way it is disposed is dependent on what category of medical waste it is and government regulations. We hope you find it easier to proper dispose of your medical waste.

Dr. Intan Airlina is consulting Director of OSHA Compliance for BioMedical Waste Solutions, LLC (www.BioMedicalWasteSolutions.com). She is an Internist that holds an Internal Medicine Degree from University of Indonesia, learned tropical diseases and infection, also certified in patient safety from a Joint Commission International (JCI) and ISO certified hospital.

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