Eco-friendly waste management

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In 1987, syringes, needles and other medical waste began to wash up on the shores of New Jersey. The incidents both posed potential danger to the general public, and revealed a healthcare-created environmental threat. It became clear that many hospitals were not properly handling their wastes. In response to these events, Congress passed the Medical Waste Tracking Act,1 a law that required hospitals to establish a cradle-to-grave waste tracking system both for chemical and biohazard waste streams. Much of the waste generated in the clinical laboratory falls under those regulations as well.

Most laboratories typically generate at least three major types of waste streams: non-regulated waste, regulated medical waste (RMW), and chemical waste. Knowing how to properly segregate and handle each type is important, but it takes education and monitoring. Having an understanding of these waste streams is the first step toward being able to reduce the overall volume of hazardous wastes.

Do you know what happens to your waste once it leaves the laboratory? As a waste generator, the laboratory is responsible for that waste from the moment it is created until it reaches its final destination. Do you know how the laboratory can save money and help to protect the environment through eco-friendly waste management? There are several methods, and we can begin by looking at each type of waste stream.

Regulated medical waste

Regulated medical waste (RMW) can be divided into two groups; biohazard waste and biohazard sharps. In the 1980s, the majority of RMW was incinerated, either by a waste disposal company or by the facility where it was generated. This solid waste incineration, however, was known to cause the creation of toxic substances (such as dioxins and mercury) which were polluting the air and some waterways. With more regulations put forth via the U.S. Clean Air Act Amendments in 1990, many incinerators became inactive and other methods of biohazard waste handling had to be developed.

Today, there are several approaches in use to process RMW. Steam sterilization, enzymatic processing, chemical disinfection, and irradiation are just some of the methods employed by waste handling companies. The advantage of many of these processes is that once treated, RMW can be placed into the municipal solid waste landfills along with non-regulated wastes. This reduces the need for segregated hazardous landfills.

Vendors who carry RMW away from your facility often charge by weight. Heavier biohazard waste bags and sharps containers will result in more money spent by the facility. Sharps waste can cost up to eight times more to dispose of than non-sharps RMW. Given that, it is important to make sure laboratory staff is not placing items into biohazard trash receptacles that do not belong there. Also, if the waste will end up in a hazardous landfill, it becomes important to reduce volumes for environmental protection purposes. Hazardous landfills are more expensive to create and maintain, and the potential for environmental contamination is greater than that from standard municipal landfills.

In most states, many laboratory items that are not grossly or visibly contaminated can be placed into regular trash. That includes gloves, disposable lab coats, plastic transfer pipettes, and even gauze. Some laboratorians are hesitant to throw these items into regular trash because of years of habit, because of a lack of segregated trash receptacles, or because they believe the items to be “contaminated” under any circumstances. An explanation of the costs and environmental effects here can be beneficial for lab staff. It is also important to educate staff about urine samples. In most states, urine is not considered RMW unless it is visibly bloody or is known to contain blood. Given that, if the laboratory does not pour waste urine down the drain, most of those heavy samples could be disposed of into regular trash receptacles (provided patient information has been obliterated). If waste is poured out, the empty plastic sample cups can also go into regular trash.

The practice of disposing of non-sharp items into sharps containers is also very costly. Often this occurs simply because other waste receptacles are not available. Gloves, gauze, paper, and many other items fill up the expensive containers and add to the weight (and therefore the cost) of disposal. Sharps containers are typically processed through sterilization and incineration which, as stated before, is not eco-friendly. Reducing sharps waste can dramatically affect hospital costs and help the environment.

Recycling sharps and sharps containers is an increasingly popular practice in the United States, and it is a great practice for reducing the amounts of incinerated biohazards. Several waste management companies offer sharps container recycling programs through which full containers are emptied, sterilized, and returned for reuse. Technologies exist that also allow recycling of the actual sharps waste for reuse as new materials. These recycling programs greatly reduce biohazard waste and can save laboratories thousands of dollars in waste expenses annually.

While it may be easy to get laboratory staff buy-in for proper waste disposal based on environmental criteria, the cost issue may not provide the same incentive. However, this is a point where education can help. Hospitals and independent laboratories often struggle with budgets and cost containment. It can be difficult to provide new equipment, improved facilities, robust benefits, and raises. Yet the challenge can be even more daunting if waste costs are needlessly high. Explaining that may motivate employees to properly segregate trash.

Chemical waste

As with regulated medical waste, chemical waste (referred to as hazardous waste) must also be tracked from generation to final disposal. Hazardous waste disposal can occur via incineration, fuel blending, or even burial. Reduction of hazardous waste is of obvious environmental importance, and it is mandated by some laboratory accrediting agencies and in some cases by the U.S. Environmental Protection Agency (EPA). If your facility is designated as a Large Quantity Waste Generator, for instance, you must note in the required biennial report to the EPA the actions you have taken to reduce your overall volume of hazardous wastes.2

Like RMW, chemical waste is often taken away from laboratories by contracted waste haulers. These companies may charge by chemical weight, number of barrels, or even time spent in waste collection. With that in mind, it is important to note that there are methods of reducing hazardous waste before it needs to be taken away.

One such method is neutralization. Some laboratories use a neutralizing agent to treat formaldehyde waste. If the aldehydes can be neutralized and the pH brought to a neutral value, the waste can be disposed of down the drain if permitted by the local waste water authority.

Distillation and recycling on-site is another way to reduce the overall hazardous waste volumes from the laboratory. Used formaldehyde solutions, xylenes, and ethanols can be distilled for reuse. This practice can generate cost savings for the facility in terms of reagent purchase, but it also greatly reduces the amounts of hazardous wastes generated by the laboratory. This waste minimization, of course, is also of great benefit to the environment. While distillation devices usually require capital funds to purchase, they can pay for themselves through reagent purchase savings in a relatively short amount of time.

Talking trash

There are other types of laboratory waste to take into account when considering expenses and environmental concerns. Radioactive waste, universal waste, and mixed wastes all need to be considered when looking at proper disposal and management. If you do not know where to begin on this laboratory waste journey, one resource to consult is available through the Clinical and Laboratory Standards Institute (CLSI). Its document Clinical Laboratory Waste Management (GP-05 A3) is a guideline that can lead you to safe, economical, and eco-friendly waste handling practices.

The waste story does not end there, however. Yes, laboratories should always be looking at ways to minimize any hazardous waste output, but the ongoing segregation and proper handling and disposal are equally important parts of the process. Initial training of laboratory staff and continued awareness of these practices is vital. This “trash talking” in your laboratory will reduce expenses, keep you out of the regulatory spotlight, and will help to protect the environment from unwanted hazardous contamination.

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