

Choosing and implementing proper storage and disposal for your facility

Medical **Liquid** Waste Management



Imagine this situation: Dr. Abbott's cardiac bypass patient is being wheeled out of the operating room, headed for recovery. The circulating nurse and scrub tech begin the process of turning the OR over for the next case. The scrub tech loads the case cart with contaminated instruments, bagged trash and numerous blood-filled suction canisters. In a hurry to get ready for the next case, the scrub tech pulls the cart next to the soiled holding room's utility sink and grabs the first full suction canister to pour it down the drain. Unfortunately, in her haste to empty the suction canister, the scrub tech squeezes a little too hard, which pops the lid

open and drenches her and the room in bloody fluid.

How could this, or similar situations, have been avoided?

Overview

In the United States, the Occupational Safety and Health Administration sets the standards for worker safety in healthcare facilities and the handling of infectious waste. To OSHA, regulated waste is defined as: Liquid or semi-liquid blood or other potentially infectious materials; contaminated items that, if compressed, would release blood or other potentially infectious materials in a liquid or semi-liquid state; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

According to the concept of universal precautions, all human blood and certain human body fluids should be treated as if they are infectious with HIV, HBV or other bloodborne pathogens. OSHA says waste should be placed in containers that are "closable; made to contain all contents and prevent leakage of fluids during handling, storage, transport or shipping; properly labeled; and closed prior to removal to prevent spilling."

In addition to the OSHA standards, other guidelines for control of infectious waste have been published by the U.S. Centers for Disease Control and Prevention as well as various state regulatory agencies.

As the regulator of medical devices in the U.S., the Food and Drug Administration uses a number of different codes to classify fluid disposal systems and their various components (canisters, tubing, suction apparatus, etc.). Except for product code FYD (apparatus, exhaust, surgical [i.e. smoke evacuators]), all of these codes are for Class I (very low risk devices) and Class II 510(k) (low risk requiring premarket notification clearance) exempt devices. Manufacturers are required only to register their establishments and submit a "device listing" form with FDA. These classifications do not require submission of clinical data demonstrating effectiveness of the devices.

Liquid waste management system marketplace

There are a variety of products on the market designed



to manage fluid waste, including canisters, liner systems and systems that collect and dispose of waste fluid directly into a sanitary sewer system. These systems were originally intended for use in environments where healthcare workers are constantly exposed to large volumes of blood and other contaminated body fluids (e.g., operating rooms, trauma units). In recent years, however, medical fluid waste management systems can now be found in any number of other hospital locations.

These products tend to fall into one of two types. The first type of system is designed to be installed permanently in one location and waste must be transported to this location by healthcare workers. The second type of system utilizes a mobile cart that collects waste from different locations and can then be connected to the hospital sewer system to dispose of the waste through some version of a docking station.

The stationary-type of fluid waste management systems are typically installed in soiled holding or utility rooms. These systems generally consist of a holding bracket for contaminated suction canisters, a tubing component that connects the canister to the waste management system and an actuating lever to start the fluid removal process. The systems themselves are connected to the main hospital drain for fluid disposal. Some of the stationary systems also have an option to provide a rinse and disinfectant cycle, so they are also connected to a water line as well. Operation of these devices is fairly simple. The user places a full suction canister in the bracket, connects the tubing to the port on the canister and activates the system. Cycle times are between three to 10 seconds, after which the empty canister can be disposed of or, in the case of reusable canisters, prepared for service.

Mobile medical fluid waste management systems have a slightly different approach. A mobile cart, containing a suction reservoir and vacuum pump, is positioned near the point of use. Suction tubing is then connected to the cart, which provides the same function as a wall-mounted suction regulator and canister. The user can adjust the vacuum pressure on these systems via a control panel on the cart, as well as monitor the reservoir's remaining capacity. Internal reservoirs in the cart-based systems have a capacity ranging from 20 liters to more than 40 liters of fluid. Once the cart is no longer needed, the user moves it to the "docking" location, which is located in a soiled holding or utility room. The user then connects the mobile cart to the wall-mounted station and activates the evacuation cycle. Similar to the stationary systems, the cart-based devices drain, rinse and disinfect their internal reservoirs. However, the cycle times tend to be somewhat longer, ranging from one to three minutes depending on the size of the reservoir.

Issues to consider

Plumbing requirements for the systems vary widely, with minimums ranging from 30 to 50 psi. All of the fluid medi-

cal waste management systems utilize between ½-inch to ¾-inch water lines for rinsing and function optimally with water temperatures above 90 degrees. These variations in operating ranges point out the need to identify the system early in a construction project, so the necessary requirements can be addressed and planned for as appropriate. Local and state regulations concerning the disposal of contaminated fluids also need to be investigated.

In addition to any installation issues, the use of medical fluid waste management systems can create some operational challenges. Stationary systems require fairly straightforward changes in staff workflow and education to ensure proper and safe use of the system. Mobile systems, however, affect not just the fluid waste disposal process but also the collection of those fluids during the course of patient care. Since they take the place of traditional wall-mounted suction regulators and canisters, the mobile cart system settings must be adjusted as necessary during use. They must also be monitored to ensure the internal reservoirs do not become full, although the majority of the cart-based fluid medical waste management systems have some version of an overflow alarm.

One other noteworthy issue presented by fluid medical waste management systems is the types of suction canisters utilized. All of the systems can accommodate a fairly broad range of standard sizes, from 500cc to 1500cc, with some systems able to handle up to 2500cc canisters. Some fluid medical waste management systems, however, only use proprietary canisters manufactured by the system vendor. These systems cannot accommodate any other size or type of suction canister, which can present a hospital's materials management department with a contracting conflict. As with the installation, the review and selection of a fluid medical waste management system should be made early in a project to ensure any contractual issues between the system and suction canister vendors are resolved to the hospital's satisfaction.

As with any system that is connected to a building's infrastructure, the selection of a fluid medical waste management system should be undertaken after careful review of the clinical, operational and technical requirements. Just like a healthcare facility's lighting and flooring, a well-planned medical fluid waste management system should provide safe and effective function for years to come.



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