Liquid Clinical Waste Management
Challenges, Guidelines and Technologies
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Liquid medical waste management is a critical concern for today's health care facilities. The problems of managing safe disposal of liquid clinical waste is becoming more challenging as the number of infectious diseases treated in health care facilities escalates and the types of pathogens become more complex. Government regulations for disposing of health care waste, and health care workers' concern over infection, are increasing throughout the world, as are liability pressures to maintain stringent handling practices. Liquid waste disposal problems are placing patients, employees, visitors and others at risk, while adding enormous costs to health care.

According to the Center for Disease Control (CDC) in Atlanta, Georgia, in the U.S. alone, nine million people work in health care professions. That is nine million people within health care facilities, not including patients and visitors, who are potentially at risk of contracting an infectious disease from exposure to liquid medical waste (blood and body fluids), plus workers outside the facility walls who may come in contact with infectious waste. This creates an enormous job for government and health care organizations to ensure that appropriate technologies are utilized and that personnel are well trained on safely managing liquid clinical waste.

Emerging Problems
Liquid clinical waste management problems are overwhelming many current technologies and practices, including the common practice of pouring liquid waste down the sanitary sewer. This practice is now being called into question because of the potential for splashing, spilling and aerosolizing-- increasing the danger of personnel infection. Compounding questionable practices and technologies is the onslaught of mutated pathogens, emerging antimicrobial resistance (multi-drug resistant TB, Methicillin-resistant staphylococci), increasing nosocomial pathogens, new infective agents (prions causing CJD or Mad Cow Disease), re-emergence of old diseases (TB, measles), changes in behavior of known pathogens (TB, syphilis, rabies) and new pathogens (Lyme Disease, Legionella, HIV, Ebola). "Infectious diseases remain the leading cause of death worldwide," states the World Health Day Advisory Committee in their publication, Emerging Infectious Diseases: Reduce the Risk, "Of the nearly 52 million deaths in the world each year, infectious diseases account for more than 17 million -- or one in three."

Beyond new pathogens, health care facilities today face additional infection transmission challenges that were not prominent issues twenty years ago. "Trends in health care that promote transmission, such as new equipment/devices, cost containment, decreased staffing, less educated caregivers, diminished practice of handwashing, overuse of antibiotics, and indifference all contribute to infection transmission." Clearly, education about the risks of inappropriate liquid waste handling and proper waste management protocol can diminish the chances of infection from liquid medical waste.

New Guidelines
In 1997, the CDC proposed new guidelines for infection control. The objectives of the
guidelines include:
(a) educating personnel about the principles of infection control and stressing individual
responsibility for infection control; (b) collaborating with the infection control department in
monitoring and investigating potentially harmful infectious exposures and outbreaks among
personnel; (c) providing care to personnel for work-related illnesses or exposures; (d)
identifying work-related infection risks and instituting appropriate preventive measures; and
(e) containing costs by preventing infectious diseases that result in absenteeism and disability.
(From Draft Guideline for Infection Control in Health Care Personnel, 1997, CDC, Atlanta,
Georgia)

Much concern focuses on patient-to-personnel transmission of HIV, Hepatitis B (HBV) and
Hepatitis C (HCV). "During the past decade, an estimated 100 to 200 health care personnel
have died annually from HBV infection," says the CDC, "The risk of acquiring HBV
infection from occupational exposure is dependent on the nature and frequency of exposure to
blood or body fluids containing blood." The risk is high for primary care workers and for
laboratory personnel who often acquire HIV, says the CDC, through specimen aerosolization,
mouth pipetting and percutaneous injury.

Beyond Facility Walls
Most liquid clinical waste disposal procedures require that any liquid clinical waste that is not
poured down the sanitary sewer, or treated and encapsulated, be transported from the point-of-
generation, through the facility, then outside to the final disposal destination. It is a difficult
and risky process of transportation and handling that greatly increases the risk of human
contact, and infection, with blood and body fluids.

The European Agreement concerning the International Carriage of Dangerous Goods by Road
(ADR), includes the requirement for solidification of infectious substances. The “yellow”
containers used for collection of medical waste are classified as “S” indicating the waste can
only be offered to the carrier if any liquid components are sufficiently solidified.

Untreated, unsolidified waste is potentially infectious throughout the transportation process,
but also, if not incinerated or encapsulated, a potential hazard at the landfill site. Beyond
patient-to-personnel infection, health care facilities and personnel must now be concerned
with what happens to their liquid waste after it has left the facility. Government regulations
are beginning to extend health care organizations’ liability for clinical waste handling beyond
the worksite itself, making disposal practices not only cost and safety issues, but long range
liability hazards as well.

Solidification and Treatment Technologies
Treating by solidification of biohazardous fluids at the point-of-generation minimizes
exposure risk dramatically. Products available, or soon to be available, in Europe and North
America either 1) treat liquid waste or 2) treat and encapsulate liquid waste so that it can’t
splash, spill or aerosolize. "With increasing concerns about infectious diseases in general,
liquid waste minimization at point of generation will become required rather than just
optional."

When a solidification treatment system is used correctly, there is little chance for infection
and liability exposure-- and the health care staff and administration can feel secure that the
infection risk ends with this process properly implemented.
Protocol

"Health care facilities need to decide that the highest possible quality care and disposal of liquid medical waste is necessary". "Standards, and perhaps audit tools, should be in place to provide health care workers disposal guidelines. I believe health care workers who are adequately informed are very concerned with this issue. In hospitals we therefore need strict procedures to ensure the environment and health care worker are safe."

Precautions that health care personnel can take for safe liquid clinical waste disposal:

- point-of-generation liquid clinical waste collection and solidification, with an appropriate product
- education about the principles of both handling infectious waste and infection control
- barrier protection to prevent contact with blood and body fluids
- frequent and appropriate hand washing
- stressing individual responsibility for liquid waste disposal and handling
- compliance to regulations on handling and road transport of liquid medical waste

There is no doubt that liquid medical waste management is a major problem for health care facilities and their employees. However, technology and treatment solutions are available. These products, along with proper waste handling training, will enable health care organizations to diffuse this critical problem and safely, and cost effectively, manage their liquid clinical waste.

Disclaimer, the Authors are involved in the manufacturing and marketing of the medical waste solidifier product SAFESORB®. The content of this whitepaper is based on information generally available to the public and not validated by propriety research of the authors.

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