

**DEPARTMENT OF  
BIOLOGICAL SCIENCES**

**MEDICAL/BIOHAZARDOUS  
WASTE DISPOSAL  
AUTOCLAVE TRAINING**

## **INTRODUCTION**

In accordance with the California Medical Waste Management Act, Health and Safety Code Stanford University generates, processes and disposes of medical waste as a distinct entity. In the past, medical waste was defined as hazardous waste containing a disease bearing organism. As a result of this new law, Stanford University must properly segregate medical waste at the point of origin and document handling prior to disposal. The methods of disposal of Department of Biological Sciences medical/biohazardous waste will be discussed in detail during this class.

## **DEFINITION OF MEDICAL WASTE**

Medical Waste is defined as follows:

- Biohazardous Waste
- Sharps Waste

## **BIOHAZARDOUS WASTE**

Biohazardous/Medical waste is defined as including, but not limited to the following:

- Laboratory Waste from the production of bacteria, viruses, or the use of spores, discarded live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate and mix cultures that normally causes or significantly contributes to the cause of morbidity or mortality of human beings.
- Microbiological specimen waste
- Infected pathological waste (both human and animal)

- Waste containing recognizable fluid blood
- BL2 levels of waste

## **SHARPS WASTE**

Sharps waste means any device having acute Rigid corners capable of cutting or piercing Including the following:

- hypodermic needles, blades, and syringes with needles or biohazardous materials
- Glass items such as Pastuer pipettes and blood vials contaminated with biohazardous waste

## **NON-MEDICAL WASTE**

Waste generated that does not contain an infectious agent.

Waste that does not contain human blood or blood products  
Or animal blood or blood products suspected of being  
Contaminated with infectious agents known to be communicable to  
Humans.

Urine, feces, saliva, sputum, nasal secretions, sweat, tears or vomitus, unless it contains fluid blood

## **RESPONSIBILITIES OF THE RESEARCH LABORATORY**

- Segregate medical waste from the point of generation and from other waste streams
- Insure that workers are trained in the proper disposal of medical waste **PRIOR** to the commencement of experimental work
- Use the proper medical waste packaging materials for sharps and autoclave waste

## **RESPONSIBILITIES OF THE DEPARTMENT OF BIOLOGICAL SCIENCES**

- Ensure that autoclaves are properly maintained.
- Ensure that adequate maintenance testing records are being maintained
- Ensure that medical waste management plan and permit are update annually and kept on file for review

## **PROPER LIQUID BIOHAZARDOUS WASTE DISPOSAL**

For all known infectious blood or known Biohazardous liquid fluids:

- Treat with 10% bleach or autoclave
- Pour down sanitary sewer

## **PROPER DISPOSAL OF ANIMAL CARCASSES**

- Place in red bag
- Transport to RAF storage freezer

**DO NOT PUT IN AN AUTOCLAVE BAG  
OR THE REGULAR TRASH**

## **PROPER DISPOSAL OF SHARPS WASTE**

- Place in red, hard plastic container
- Do not autoclave sharps containers
- Ensure that the sharps container will be disposed of as red bag waste

**SHARPS CONTAINERS MUST NOT BE  
DISPOSED OF IN THE REGULAR TRASH!**

## **PROPER DISPOSAL OF NON CONTAMINATED PLASTIC PIPETTES AND SYRINGES**

- Plastic Pipettes and pipet tips may be disposed of in the regular trash
- Non-contaminated plastic syringes **WITHOUT NEEDLES** may also be Disposed of in the regular trash

## **PROPER DISPOSAL OF MIXED WASTE**

- Waste containing biological and chemical waste must be handled as

## **Chemical Waste**

- Waste containing both biological and radioactive waste must be treated as

## **Radioactive Waste**

## **AUTOCLAVE HAZARDS**

- Steam Leaks
- Hot metal surfaces
- Implosion risk
- Hot liquid boil over
- Pre-cycle biohazards
- Shattered glass

## **SAFETY CONSIDERATIONS FOR AUTOCLAVE ATTENDENTS**

- Use heat resistant gloves, goggles and other protective clothing

- **DO NOT OVERLOAD** any containers or bags which are put in the autoclave
- Never place tightly sealed containers in an autoclave
- Never autoclave volatile chemicals or radionuclides
- Use caution in opening the hatch
- Never lift an autoclave bag from the bottom in case sharps or broken glass may be present
- Use caution when autoclaving pressurized containers. Lightly cover such glassware.
- Check glassware for cracks prior to cycle.

## **PROPER AUTOCLAVE BAG PACKAGING**

- Bag should be clear, not red
- Bag must not be over packed
- Bag should be loosely secured with indicator tape
- Bag must not contain loose sharps

## **AUTOCLAVE LOADING**

- Never autoclave anything directly on the floor of the autoclave
- Use a rack and autoclave proof plastic trays
- Never overpack the autoclave so that material brushes against a metal surface (which is super-heated during the cycle)

## **DRY LOADS**

- Allow time for cool-down period
- Place dry loads in racks or grids. If foil wraps are used, allow for a steam path
- Water accumulation on trays degrade the effectiveness of the dry cycle
- Glassware should contain a small amount of

water to expedite the decon process

## **WET LOADS**

- **COOL DOWN PERIOD IS MANDATORY!**
- Avoid the use of boiling stones in autoclave liquids
- Flasks must be no more than 2/3 full to prevent boil-over
- use eyewash/deluge shower if scalded by hot autoclaved liquids

## **AUTOCLAVE PRE-START PROCEDURES**

- Be sure to wear gloves and safety equipment
- Check gasket seat for cleanliness
- Check the door gasket for cracks and fraying
- Load run on trays
- Do not rely on autoclave signals

## **AUTOCLAVE OPERATIONAL CONSIDERATIONS**

- Keep safety equipment clean and available
- **IN THE EVENT OF AN ABOTED RUN DO NOT  
OPEN THE AUTOCLAVE OR LOOK INTO  
THE HATCH!**
- **Label** cooling materials with a “**Caution,  
Hot!**” sign

## **OTHER AUTOCLAVED WASTE CONSIDERATIONS**

- Not all clear bags are autoclavable
- Never autoclave a clear bag with recognizable fluid blood. This bag must be handled as biohazardous waste
- Never autoclave a clear bag with animal waste. The animal carcasses go in a red bag

## **RECORDKEEPING**

- Autoclaves must be tested and documented on a monthly basis with the indicator organism, *Bacillus stearothermophilus*.
- A written SOP must be filed for biological indicators and the autoclave procedures
- Calibrated thermometer records must be kept for one year.

## **CONCLUSION**

The Department of Biological Sciences generates a variety of waste. Because of current laws, we must make every effort to properly segregate and dispose of medical waste. The use of the autoclave must also be consistent with the Medical Waste Management Act.

