Pharmaceutical Waste Management

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***Abstract* – In Pharamceutical Industry, Pharamceutical Waste Management Is One of an Important Part.The Waste of Pharmaceuticals are in different Forms such as manufacturing wastes, expired products and strips etc. To prevent the pollution of pharmaceuticals such as an organization of environmental, agencies of law enforcement, pharmaceutical waste management and government agencies.**

***Key Words* - Pharmaceutical waste, waste management, prevention.**

1. INTRODUCTION

Pharmaceutical Waste Management:
It is an important in pharmaceutical industries consist of 1.generation 2.Prevention 3.Characterization 4.Monitoring 5.treatement 6.Handling 7.Reuse & Dispotion of solid and liquid wastes.

Sourves Of Pharmaceutical Waste:

- Expired products
- Products that no longer in use
- Products discarded due to contaminated packaging
- Off-specification or outdated raw material
- Reaction residues
- Used filter media
- Used chemical reagents
- Laboratory wastes

Regulatory Bodies that oversee pharmaceutical wastemanagement:

- ✓ Environmental protection agency [EPA]
- ✓ Drug enforcement administration [DEA]
- ✓ Occupational safety and healthadministration [OSHA]
- ✓ State environmental protection agencies
- ✓ State pharmacy board
- ✓ Local publicly owned treatment works [POTW]

Pharmaceutical Waste Classification :

1) Hazardous Waste :

Waste that is dangerous or potentially harmfullto human health is called hazardous waste.
It can be solid, liquid, contained gases or sludegs.

2) Non-Hazardous Waste:

Materials in life category are considered to haveno significant hazardous properties'

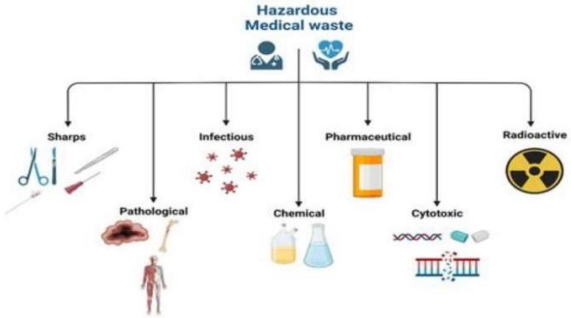
3) Chemo Waste:

Chemicals are classified Under the chemo waste.

*Pharmaceutical wastes are also classified based on its

1. Ignitability
2. Corrosivity
3. Reactivity
4. Toxicity

*Al the wastes needs to be treated properly for health and safety of human being and environment.



2. METHODOLOGY

Methods for treatment and disposal of pharmaceutical waste:

1) INCINERATION:

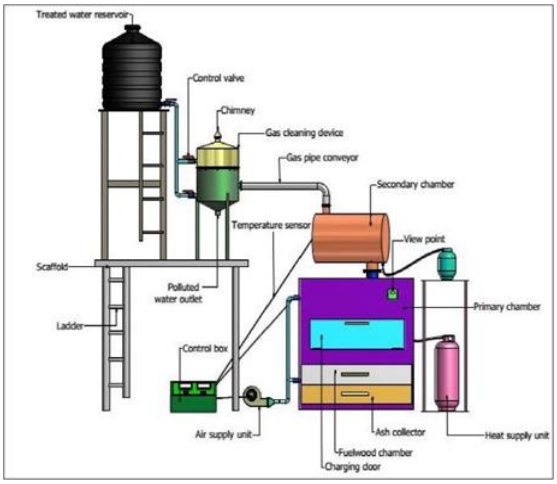
Incineration is disposal method in which organic waste are subjected to combustion so as to convert them into residue and gaseous products.

*This method is useful for disposal of residue of both1-Solid water management and

2-Solid residue from waste water management.

*Incineration and other high temperature waste treatment systems are described as Thermal Treatment''.

*Incineration convert waste into gas, steam & ash.



2) AUTOCLAVING:

Autoclaving use saturated steam in direct constact with BMW (Biomedical Wastes) in a pressure vessel.

At a time length and temperature sufficient to kill pathogens.

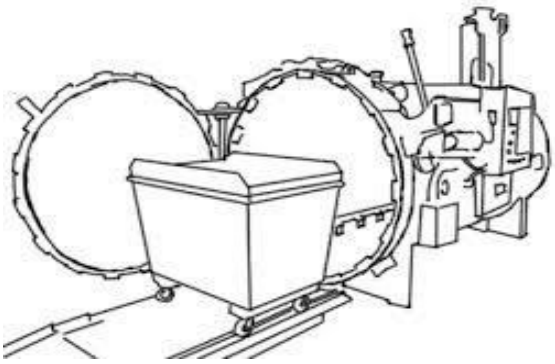
*The biomedical waste rules specify the minimum temperature, pressure and resident time for auto clavefor safe disinfection.

*Autoclaving produces a waste that can be land filledwith munivple waste.

*Autoclaving requires:

-Qualified techniques

-Minimum investment and operating cost.



3) MICROWAVING:

Application of an electromagnetic field over the BMW provokes the liquid in the waste to escillate and heat up.Destroying the infectious components.

*Technology is effective in the UV radiations reaches the waste material.

*Microwaving produces a waste that can be land filled with municipal waste.

4) CHEMICAL DISINFECTION:

Chemical disinfection Is most suitable for treating liquid waste such as

1.blood

2.urine

3.stools

4.health care facility sewage.

*Addition of strong oxidants like 1chlorine compounds.2ammoniumsalts.3aldehydes.4phenol compounds Rill or inactivates pathogens in BMW.

*Microbiological cultures, multilated sharps orshredded solids can be treated by chemical disinfection.

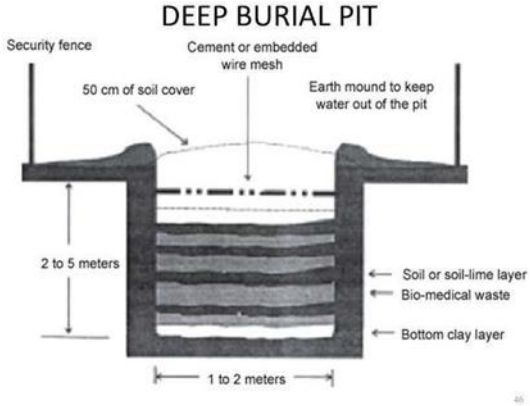
*As chemical disinfectants have hazardous propertiesuser shou,d wear protective cloths.

5) DEEP BURIAL:

Accourding to biomedical waste rules Human anatomical and animal wastes is disposed of by deep burial.

*The deep burial site should be prepared by digging a pit of about 2 meteres deep (In an area where soil is relstively impermeable , no wells and no risk of surface water contamination).

*The pit should be half-filled with BMW , Then covered with lime within 50 cm of surface , the rest of the pit with soil.



6) SECURE LAND FILLING :

Secure land filling involves disposal of solid wastes of a land designed and operated to receive hazardous wastes.

*Land filling is established in abandoned or unused land.

*A properly designed and well-managed longfill canbe a hygienic and relatively inexpensive method of disposing of waste materials.

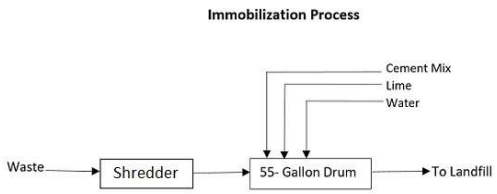
7) WASTE IMMOBILIZATION (ENCAPSULATION):

Encapsulation involves immobilizing the pharmaceuticals in a solid block within a plastic or steel drum.

*They are filled to 75% capacity with solid and semi-solid pharmaceuticals.

Remaining space is filled with medium like cement or cement lime mixture or plastic foam.

They sealed drums should be placed at the base of landfill and covered with fresh munivipal solid waste.



8) SEWER:

Some liquid pharmaceuticals e.g syrups.IV fluids canbe diluted with water and flushed into sewar.

*Minimizing Pharmaceutical Waste :

- Considering life cycle impact in the purchasingprocess
- Maximizing the use of opened chemotherapy vials
- Implementing a sample policies
- Priming and flushing IV lines with saline solution
- Examining the size of container relative to use
- Replacing prepackaged unit dose liquids with patient specific oral syringes
- Controlled substances
- Monitoring dating on emergency syringes

3. Reviewing inventory control to minimize outdates

3.CONCLUSION

In today's scenario with the growing life style, the need of pharmaceutical compounds is also increasingand they are with environment in extremely large quantity and the system present is not able to controlthe untreated or partially pharmaceutical waste.

Pharmaceutical waste management continues to be new frontier for health care facilities. New waste classification is observed which is increasing the complexity of management of waste, so the new techniques of disposal are developing regularly to make surrounding ecofriendly. But one thing we should keep in mind that technique also should be cost-effective with better treatment facilities. Entering of drugs or any pharmaceutical waste into ecosystem, biotic, abiotic factors and humans causing severe side-effects, so we should sincerely investigate tocontrol them.

4.ACKNOWLEDGMENT

It is not possible to prepare a project report without the assistance and encouragement of other people. This one is certainly no exception It is my privilegeto express my respected and esteemed project guideAssistant Professor

Prof. Madane.N.N Sir who has provided excellent guidance,valuable advice, shared intelligent thought and discipline which helped me to complete this work successfully.

I would like to express my sincere gratitude towards respected Principal Dr.prachi jain Kishori college of pharmacy, Beed for their invaluable suggestion and timely help and providing me the necessary facilitiesto carry out this project work with great ease and precision.

I express my heartfelt thanks to department of Pharmaceutics, Department of Pharmaceutical Chemistry, Department of Pharmacology and Department of Pharmacognosy for their constanthelp and timely cooperation incompletion of my project work.

I express my heartfelt thanks to all non teaching staff for their constant help and timely cooperation in completion of my project work.

Besides this am thankful to all those who have knowingly and unknowingly helped me in the successful completion of this project.

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