

# **BIO WASTE MANAGEMENT RULE 2016**

---

## BIO MEDICAL WASTE (MANAGEMENT AND HANDLING) RULES, 2016

---

- ✖ MEDICAL WASTE
- ✖ Means any waste ,which is generated during the diagnosis ,treatment or immunization of human being or animals or in research activities pertaining thereto or in the production or testing of biologicals and including categories as mentioned in schedule 1.
- ✖ All Bio Medical Waste are hazardous.In hospital,it comprises of 15% of total hospital waste.

# OCCUPIER

---

- ✘ In relation to any institution generating biomedical waste which includes a hospital,nursing homes,clinic,dispensary,veterinary institution,animal house,pathological laboratory,blood bank by whatever name called means a person who has control over that institution and /or its premises.
- ✘ AND shall not apply to Radioactive waste covered under the MSW Rules,2000 ,Lead Acid Batteries,Hazardous Waste,E waste,Hazardous micro organisms.



# DUTIES OF HEALTH CARE FACILITIES

---

Health care facilities (HCF) shall make a provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste.

Pre-treat the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilization on-site in the manner as prescribed by the World Health Organization (WHO) or National AIDs Control Organization (NACO) guidelines and then sent to the common bio-medical waste treatment facility for final disposal.

Phase out use of chlorinated plastic bags, gloves and blood bags within two years from the date of notification of these rules

Provide training to all its health care workers and others involved in handling of bio medical waste at the time of induction and thereafter at least once every year.

Immunize all its health care workers and others involved in handling of bio-medical waste for protection against diseases including Hepatitis B and Tetanus that are likely to be transmitted by handling of bio-medical waste,

Establish a Bar-Code System for bags or containers containing bio-medical waste to be sent out of the premises

Report major accidents including accidents caused by fire hazards, blasts during handling of bio-medical waste and the remedial action taken to SPCB

Existing incinerators shall achieve the standards for retention time in secondary chamber and Dioxin and Furans within two years from the date of this notification



# APPLICABLE TO ALL PERSONS WHO

---

- × Generate
- × Collect
- × Receive
- × Store
- × Transport
- × **Treat**
- × Dispose
- × Handle-Bio Medical Waste in any form

## Treatment and disposal

Every HCFs, where required, shall set requisite bio-medical waste treatment facilities bio-medical waste treatment facilities like incinerator, autoclave, microwave system for the treatment of waste, of, ensure requisite treatment of waste at a common waste treatment facility of any other waste treatment facility.

- ✘ No occupier shall establish on -site treatment and disposal facility, if a service of `common bio-medical waste treatment facility is available at a distance of seventy - five kilometer.
- ✘ In cases where service of the common bio-medical waste treatment facility is not available, the Occupiers shall set up requisite bio medical waste treatment equipment like incinerator, autoclave or microwave, shredder prior to commencement of its operation, as per the authorization given by the prescribed authority.

## SEGREGATION, PACKAGING, TRANSPORTATION AND STORAGE

- ✗ Bio-medical waste classified in to 10 categories based on treatment options.
- ✗ No untreated bio-medical waste shall be kept stored beyond a period of 48 hours
- ✗ Provided that if for any reason it becomes necessary to store the waste beyond such period, the authorized person must take permission of the prescribed authority and take measures to ensure that the waste does not adversely affect human health and the environment.
- ✗ Bio-medical waste classified in to 4 categories based on treatment options.
- ✗ Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste shall not be stored beyond a period of forty-eight hours:
- ✗ In case for any reason it becomes necessary to store such waste beyond such a period, the occupier shall take appropriate measures to ensure that the waste does not adversely affect human health and the environment and inform the SPCB along with the reasons.



# AUTHORIZATION

---

- ✖ Hospital treating 1000 or more patients per month to obtain authorization from SPCBs/PCCs
- ✖ One time Authorization for Non-bedded HCFs.
- ✖ The validity of authorization shall be synchronized with validity of consent orders for bedded HCFs

# **PRESCRIBED AUTHORITY FOR ENFORCEMENT**

---

- ✖ Jharkhand State Pollution Control Board (JSPCB)

# ADVISORY COMMITTEE

- ✘ The Government of every State/Union Territory shall constitute an advisory committee with the experts in the field of medical and health, animal husbandry and veterinary sciences, environmental management, municipal administration, and any other related department or organization including non -governmental organizations.
- ✘ Ministry of Defense shall constitute, an Advisory Committee under Additional Director General of Armed Forces Medical Services with representative of Ministry of Defense, MoEFCC, for HCFs under Armed forces under the Ministry of Defense
- ✘ No change in the concept except additional members.
- ✘ Shall meet once in Six Months.



## STANDARDS FOR EMISSION FROM INCINERATORS

---

- ✖ SPM in the Incinerator's Emission 150 mg/nm<sup>3</sup>
- ✖ Residence Time in Secondary chamber of incinerators is 1 second
- ✖ 50 mg/nm<sup>3</sup>
- ✖ 2 second

## SITE FOR COMMON BIO-MEDICAL WASTE TREATMENT AND DISPOSAL FACILITY

---

× Nil

× The department dealing the allocation of land shall be responsible for providing suitable site for setting up of common biomedical waste treatment and disposal facility in the State Government.

## MONITORING OF IMPLEMENTATION

× Nil

- × Ministry of Environment, Forest and Climate Change shall review the implementation of the rules in the country once in a year through the State Health Secretaries and CPCB.SPCBs
- × State Government shall constitute District Level Monitoring Committee under the chairmanship of District Collector or District Magistrate or Deputy Commissioner or Additional District Magistrate to monitor the compliance of the provisions of these rules in the health care facilities.
- × The District Level Monitoring Committee shall submit its report once in six months to the State Advisory Committee, State Pollution Control Board for taking further necessary action.
- × The District Level Monitoring Committee shall comprise of District Medical Officer or District Health Officer, representatives from SPCB,
- × Public Health Engineering Department, local bodies or municipal corporation,
- × Indian Medical Association, common bio-medical waste treatment facility registered NGO working in the field of bio-medical waste management
- × District Medical Officer shall be the Member Secretary of this Committee.



## DUTY OF THE OCCUPIER

IT SHALL BE THE **DUTY OF EVERY OCCUPIER** OF AN INSTITUTION  
GENERATING BIO MEDICAL WASTE TO

- ✘ Take all steps to ensure that waste is handled without any adverse effect to human health and the environment.
- ✘ To install an appropriate facility to ensure requisite treatment of waste in accordance with Schedule 1
- ✘ Ensure proper segregation of waste into containers/bags at the point of generation in accordance with Schedule 2
- ✘ Ensure proper labeling of containers/bags according to schedule 3

## CONTT..

---

- ✘ Make an application in Form 2 to JSPCB for grant of Authorization
- ✘ Submit Annual Report to JSPCB in Form 4 by 30th June every year.
- ✘ Maintain records about generation, collection, storage, treatment and disposal of waste.
- ✘ Report Accident occurred while handling in Form 1 to JSPCB

# CATEGORIES OF BIO WASTE

*Table - 1 : Classification of Biomedical Wastes*

Waste category	Waste Class
Cat. No. 1	Human Anatomical Wastes
Cat. No. 2	Animal Wastes
Cat. No. 3	Microbiology and Biotechnology wastes
Cat. No. 4	Waste Sharps
Cat. No. 5	Discarded medicines and Cytotoxic drugs
Cat. No. 6	Soiled wastes include items contaminated with blood, body fluids such as cotton, dressings, linen, beddings etc.
Cat. No. 7	Solid wastes i.e. waste generated from disposable items other than sharps such as tubings, catheters, IV sets.
Cat. No. 8	Liquid wastes
Cat. No. 9	Incineration ash is generated of any biomedical waste.
Cat. No. 10	Chemical wastes



# COLOUR CODING

**Table - 2 : Colour coding and type of containers for disposal of Biomedical waste**

Waste category	Type of Containers	Colour code
Category 1	Plastic bags	Yellow
Category 2	Plastic bags	Yellow
Category 3	Plastic bags/ disinfected container	Yellow/Red
Category 4	Puncture proof plastic containers	Blue
Category 5	Plastic bags	Black
Category 6	Plastic bags/ disinfected containers	Yellow/Red
Category 7	Disinfected containers/ puncture proof containers	Red/Blue/White
Category 8	Not applicable	Not applicable
Category 9	Plastic bags	Black
Category 10	Plastic bags (for solids)	Black

**Table - 3 : Recommended concentration/dilution of Chemical disinfectants**

<b>Disinfectants</b>	<b>Contaminated condition</b>	<b>Grossly contaminated condition</b>
Sodium hypochlorite 5% available chlorine as liquid bleach	20 ml/L	200 ml/L
Calcium hypochlorite 70% available chlorine	1.4 gm/L	7.0 gm/L
Sodium dichloro- isocyanurate powder	1.7 gm/L	8.5 gm/L
Chloramine 20% available chlorine	20 gm/L	20 gm/L
Tincture of Iodine/ Povidone Iodine	2.5%	2.5%
Ethyl alcohol	70%	70%
Isopropyl alcohol	70%	70%
Glutaraldehyde 2%	2.5%	2.5%
Formaldehyde 40%	5%	10%
Savlon	5%	10%
Dettol 4.8% v/v	4%	10%
Cresol	2.5%	5%

# ISSUES





# STEPS FOR BIO MEDICAL WASTE MANAGEMENT

- ✕ Step 1
- ✕ SEGREGATION
- ✕
- ✕
- ✕
- ✕
- ✕ Step 2
- ✕
- ✕ COLLECTION AND STORAGE
- ✕
- ✕
- ✕
- ✕
- ✕ Step 3
- ✕
- ✕ TRANSPORTATION
- ✕
- ✕
- ✕
- ✕ Step 4
- ✕
- ✕ TREATMENT AND DISPOSAL

# SEGREGATION OF WASTE

## DO'S AND DON'TS

---

- × SEGREGATION AT SOURCE OF GENERATION
- × DON'T MIX INFECTIOUS AND NON INFECTIOUS WASTE
- × FOUR COLOUR BUCKETS
- × BLACK-GENERAL WASTE(NON INFECTIOUS)
- × **RED**-INFECTIOUS PLASTIC WARES LIKE SALINE BOTTLES,SYRINGE,CATHETERS ,URINE BAG,BLOOD BAGSETC
- × **YELLOW**-ANATOMICAL AND SOILED WASTE LIKE PLACENTA,PATHOLOGICAL WASTE,SOILED COTTON,DRESSINGS,LABORATORY WASTE ETC
- × **Blue-PUNCTURE** PROOF CONTAINER FOR METAL AND GLASS SHARP,NEEDLE,BLADE,BROKEN VIALS ETC

## COLLECTION AND STORAGE OF WASTE-DO'S AND DON'TS

---

- ✗ ALWAYS COLLECT THE WASTE IN COVERED BINS
- ✗ FILL THE BINS UP TO 3/4<sup>TH</sup> LEVEL
- ✗ NEVER OVERFILL THE BINS
- ✗ NEVER MIX INFECTIOUS AND NON INF IN THE SAME BIN
- ✗ NEVER STORE WASTE BEYOND 48 HOURS



# TRANSPORTATION DO'S AND DON'TS

---

- ✗ ALWAYS CARRY/TRANSPORT THE WASTE IN CLOSED CONTAINERS
- ✗ USE DEDICATED WASTE COLLECTION BINS/TROLLEYS/WHEEL BARROW FOR TRANSPORTATION WASTE
- ✗ TRANSPORT WASTE THROUGH A PRE DEFINED ROUTE WITHIN THE FACILITY
- ✗ NEVER TRANSPORT THE WASTE IN OPEN CONTAINERS/BAGS,IT MAY SPILL AND LEAD TO SPREAD OF INFECTION
- ✗ NEVER TRANSPORT WASTE THROUGH CROWDED AREAS

# TREATMENT AND DISPOSAL OF BIO MEDICAL WASTE

---

- ✗ ALL SHARP WASTE-DISINFECTED IN PUNCTURE PROOF CONTAINERS AND DISPOSED OFF IN SHARP PIT
- ✗ INFECTED AND SOILED WASTE-DEEP BURIAL PIT AND COVERED WITH A LAYER OF LIME AND SOIL OR INCINERATED
- ✗ INFECTED RECYCLABLES SUCH AS PLASTIC WASTE-SHOULD BE FIRST CUT AND PUT IN RED BUCKET.DISINFECTED IN DISINFECTION TANK USING BLEACH SOLUTION AND AUTOCLAVED AND THEN SHRED.IT IS THEN SENT FOR RECYCLING
- ✗ NON INFECTED WASTE-KITCHEN WASTE ,LEAF FALLING MUST BE PUT IN COMPOST PIT(MIXING WITH SOIL) AND THE MANURE CAN BE USED IN GARDENING
- ✗ PACKAGING MATERIAL,PAPER,RECYCLABLE PLASTIC CAN BE SOLD TO AUTHORISED RECYCLERS.

# CHEMICAL DISINFECTION

---

- ✗ THAT THE USED PRODUCT IS TREATED PRIOR TO DISPOSAL
- ✗ TREATMENT SHOULD BE WITH A SOLUTION OF 1% SODIUM HYPOCHLORITE OR BLEACHING (10 GM IN 1 LITRE OF WATER)
- ✗ WASTE SHOULD BE SUBMERGED FOR AN HOUR
- ✗ DISINFECTION PROCESS SHALL BE DONE EVERYDAY



# **SITE OF CHEMICAL DISINFECTION**

---

- ✘ SHARP WASTE-DISINFECTANT TO BE PLACED IN PPC
- ✘ PLASTIC WARE-DISINFECTION BE CARRIED OUT DISINFECTION TANK
- ✘ ANATOMICAL WASTE-DISINFECTION BE PLACED INSIDE THE YELLOW BUCKET

# HANDLING MERCURY SPILLS

---

- × SOURCES

- × THERMOMETER, B.P INSTRUMENT, BATTERIES, DENTAL AMALGAM

- × PROCEDURES

- × MERCURY SHOULD BE HANDLED AS HAZARDOUS WASTE NOT AS INFECTIOUS OR GENERAL
- × **MERCURY CONTAINMENT KIT** WHICH INCLUDES
- × **TWO PAIR** OF LATEX GLOVES, FACE MASK, PROTECTION FOR EYES, SEALING TAPE, 10CC SYRINGE, COVERED PLASTIC/GLASS CONTAINER WITH WATER

# STEPS TO BE FOLLOWED

---

- ✗ NEVER TOUCH MERCURY WITH BARE HANDS AS IT IS ABSORBED QUICKLY THROUGH SKIN
- ✗ REMOVE ALL JEWELLARY AS IT COMBINES WITH GOLD,SILVER AND OTHER METAL
- ✗ CLEAR THE AREA AROUND THE SPILL
- ✗ WEAR ALL PROTECTIVE GEAR
- ✗ TAKE TWO HARD CARDBOARD SHEETS TO GATHER ALL THE MERCURY
- ✗ USE A SYRINGE TO SUCK UP MERCURY
- ✗ POUR THE CONTENT IN PLASTIC/GLASS CONTAINER WITH 5 ML TO 10 ML WATER
- ✗ PUT SEALING TAPE IF USED IN PLASTIC/GLASS CONTAINER
- ✗ PUT THE USED SYRINGE IN A SEPARATE PLASTIC CONTAINER FOR FURTHER USE.



## **STORAGE AND DISPOSAL OF WASTE MERCURY**

---

- ✘ MERCURY CAN BE INDEFINITELY STORED IN THIS CONDITION BUT HOSPITAL SHOULD SEEK OUT A GOVT APPROVED AND LICENSED HAZARDOUS WASTE DISPOSAL FIRM OR MERCURY RECYCLER WHICH CAN HANDLE MERCURY
- ✘ MERCURY COLLECTED IN THIS MANNER CAN BE CLEANED AND REUSED IN NEW EQUIPMENT

# HANDLING LIQUID WASTE SPILLS

---

- ✘ LIQUID WASTE IS ANY BLOOD,BODY FLUID,PUS,ANY DISCHARGE FROM WOUNDS OR LIQUID CHEMICALS
- ✘ 1.CLEAN THE LIQUID WASTE SPILL BY ADDING EQUAL OR MORE QUANTITY OF BLEACHING POWDER SOLUTION AND LEAVE FOR 30 MIN
- ✘ 2.WIPE THE AREA WITH A SWAB/COLTH
- ✘ 3.DISCARD THE SWAB/CLOTH AFTER CLEANING THE AREA INTO YELLOW BUCKET

# DISPOSAL OF DISINFECTANT

---

- ✗ DO'S
- ✗ ALWAYS DILUTE THE DISINFECTANT BEFORE DISPOSAL INTO DRAINS
- ✗ 2.WEAR PERSONAL PROTECTIVE GEARS WHILE HANDLING DISINFECTANTS
- ✗ DON'T'S
- ✗ NEVER DISPOSE THE CHEMICALS ,DISINFECTANT WITHOUT DILUTING THEM
- ✗ NEVER USE EXPIRED CHEMICALS OR DISINFECTANTS.SEND THEM BACK TO THE STORES



# SEGREGATION



# COLLECTION AND STORAGE



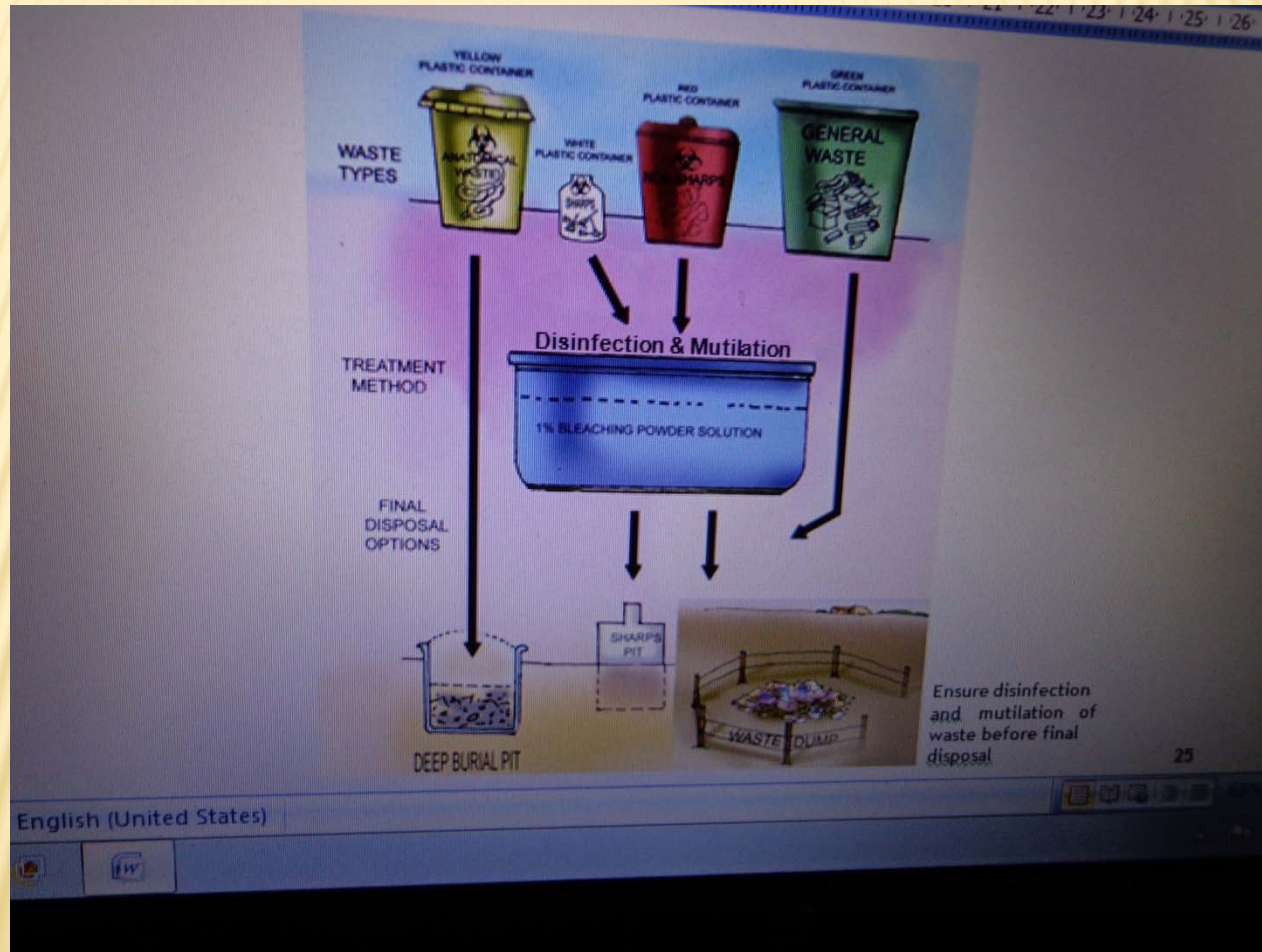


# TRANSPORTATION





# TREATMENT AND DISPOSAL



# SHARPS AND ITS KIND

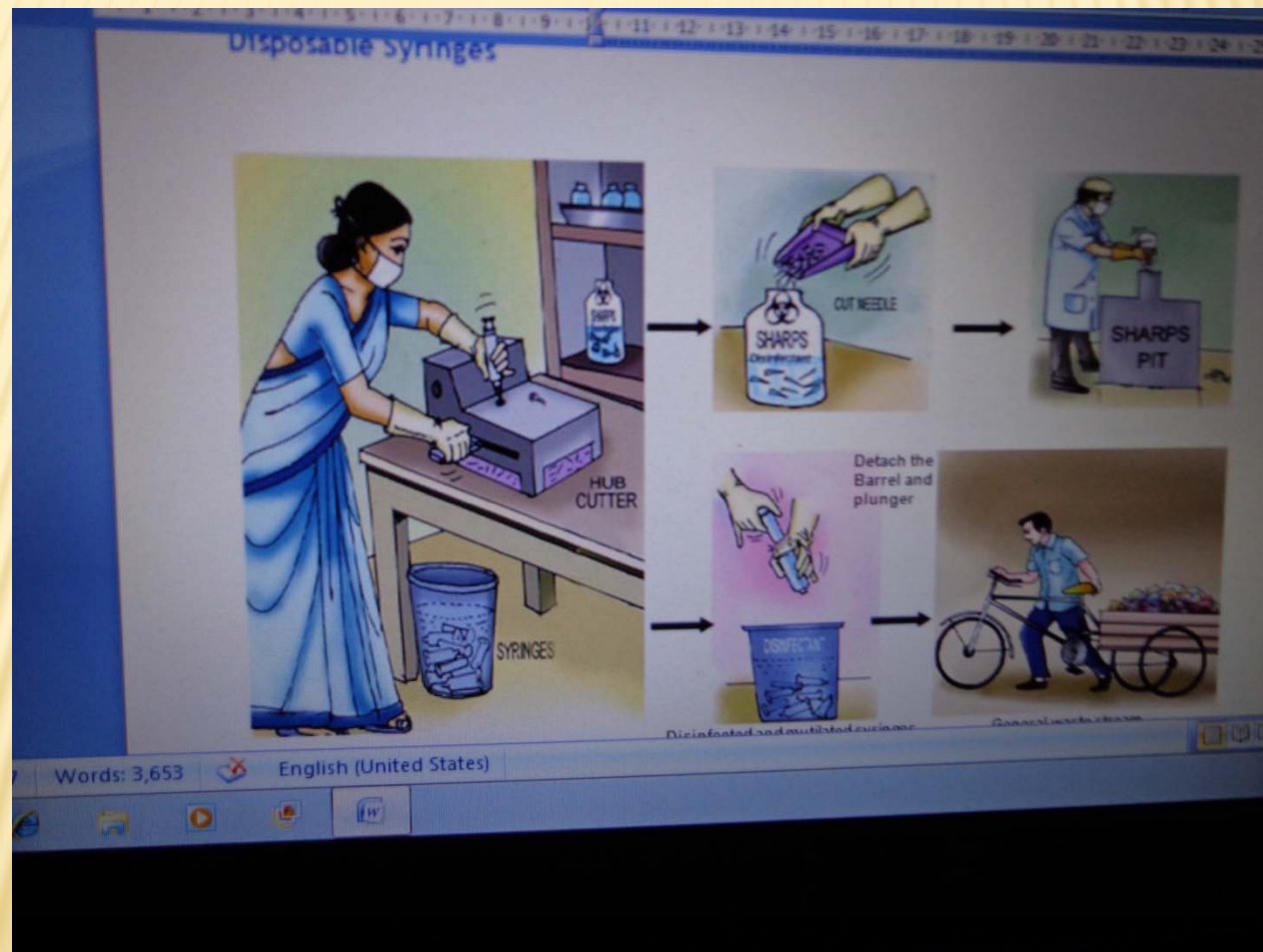
## 2.1.1 Sharps and its Kind

Sharps are such objects that are capable of causing injuries by piercing the skin. Sharps include metal sharps like needles and blades and glass sharps like broken ampoules, vials and slides





# DISPOSABLE SYRINGE



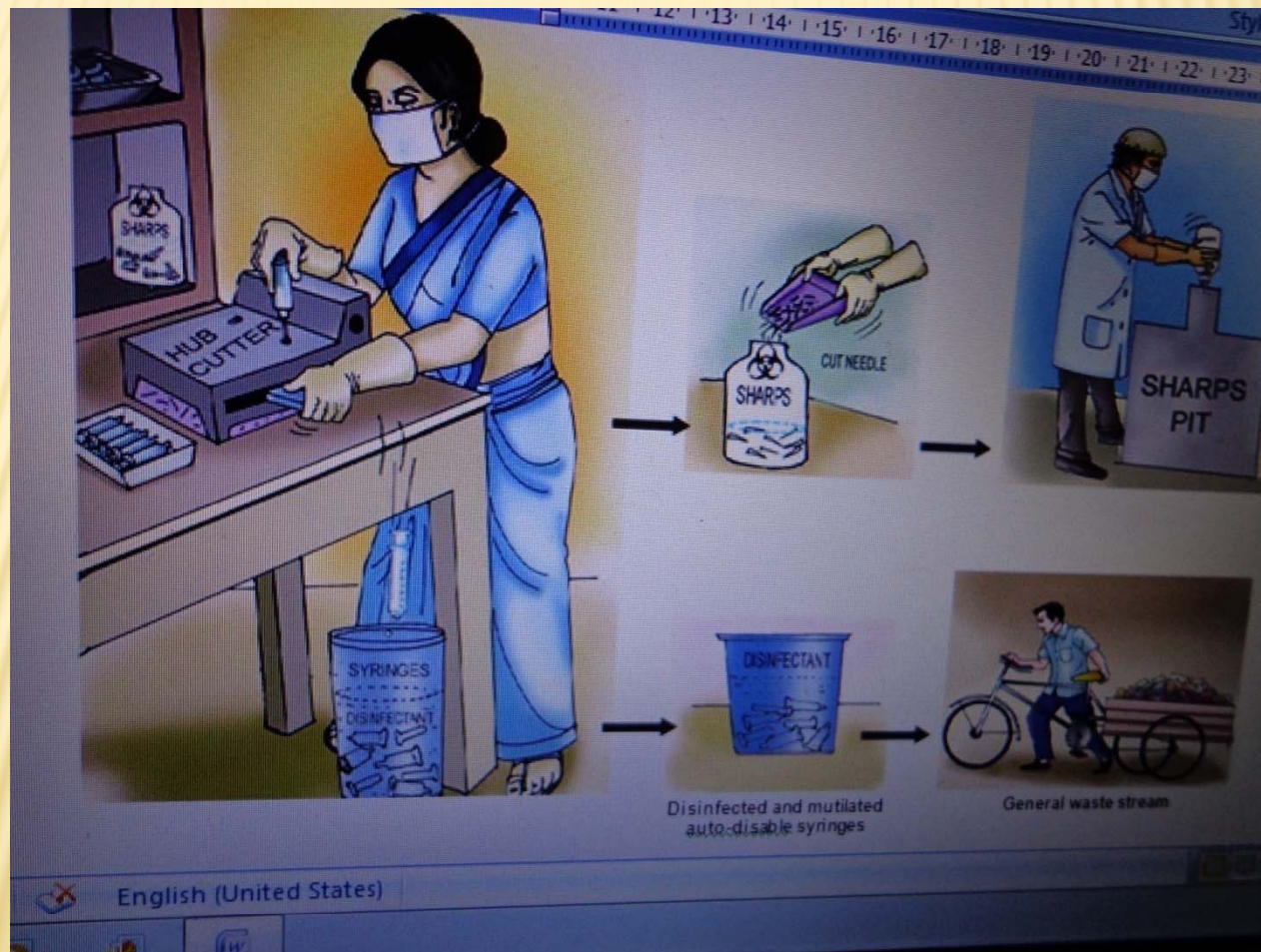


# NEVER BURN A SYRINGE

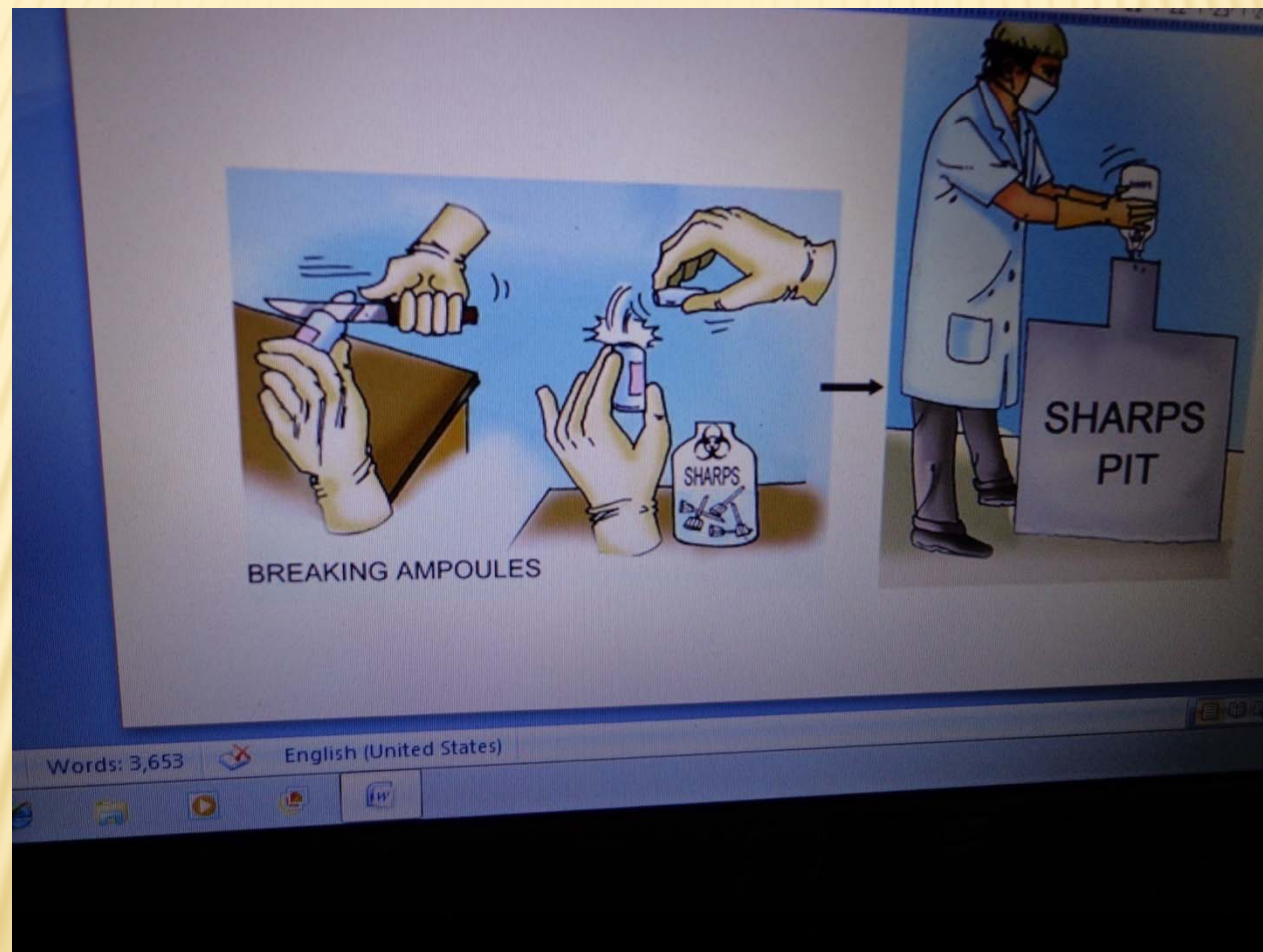




# AUTO DISABLE SYRINGE

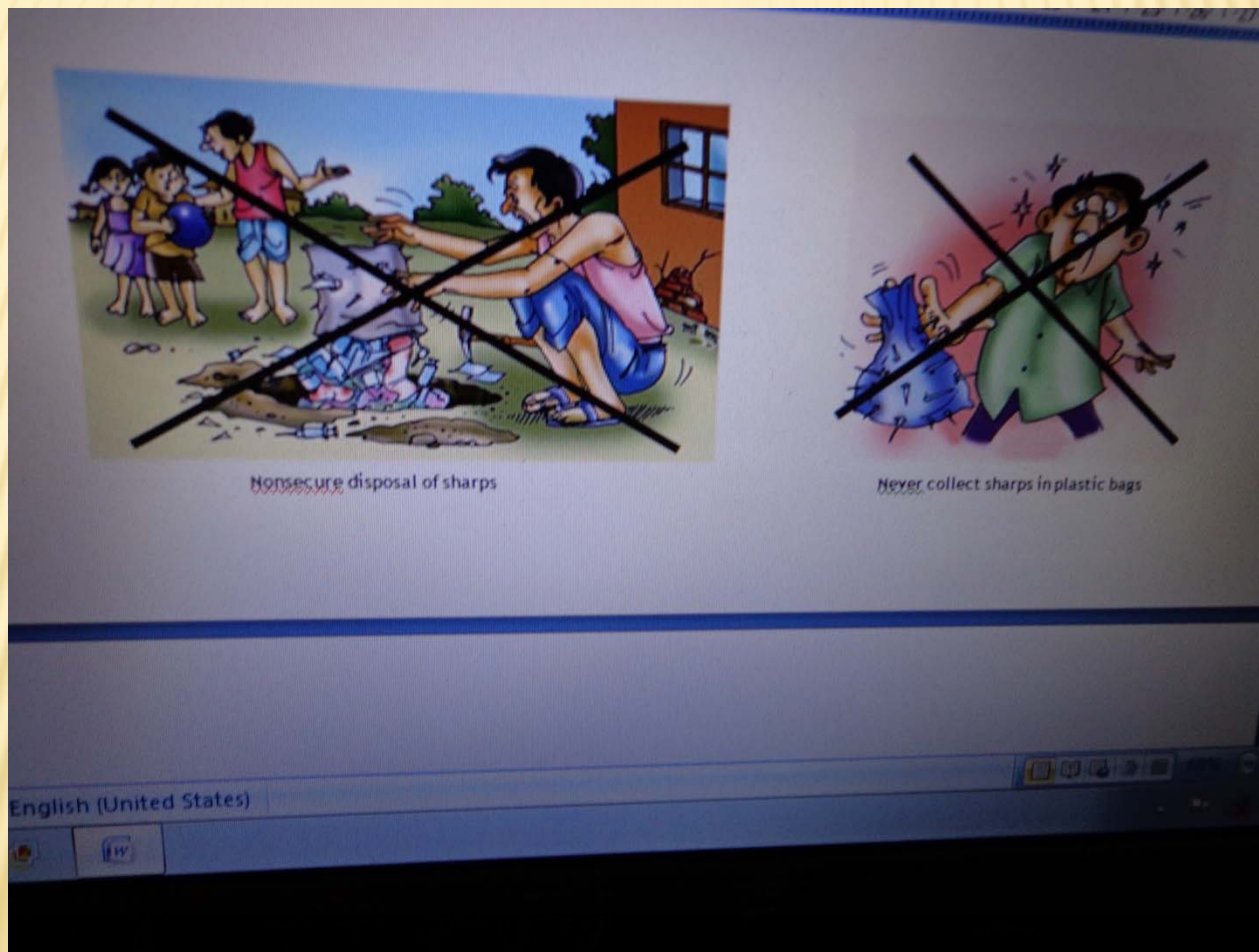


# BREAKING AMPOULES

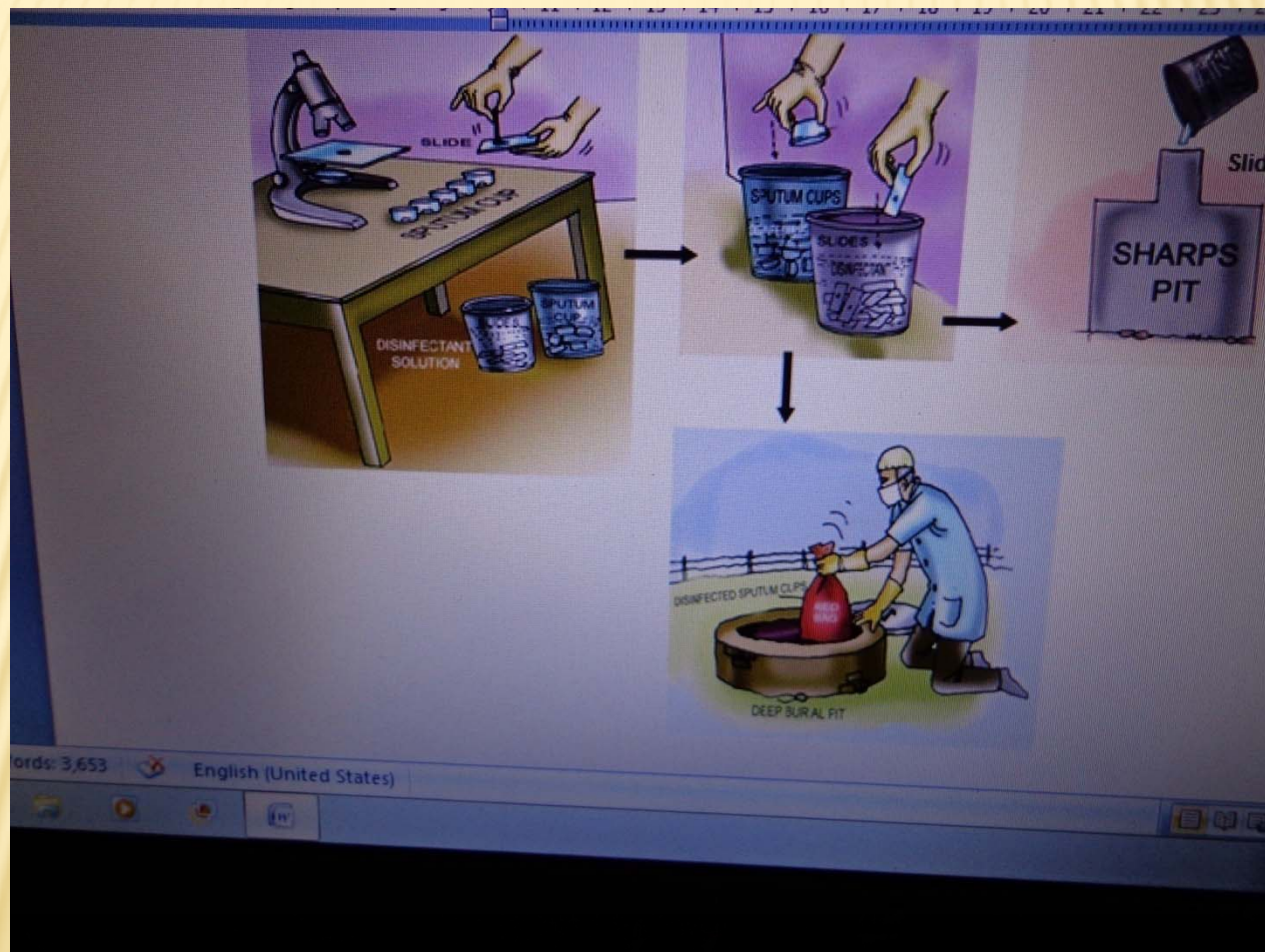




# NEVER BURY IN OPEN AREA

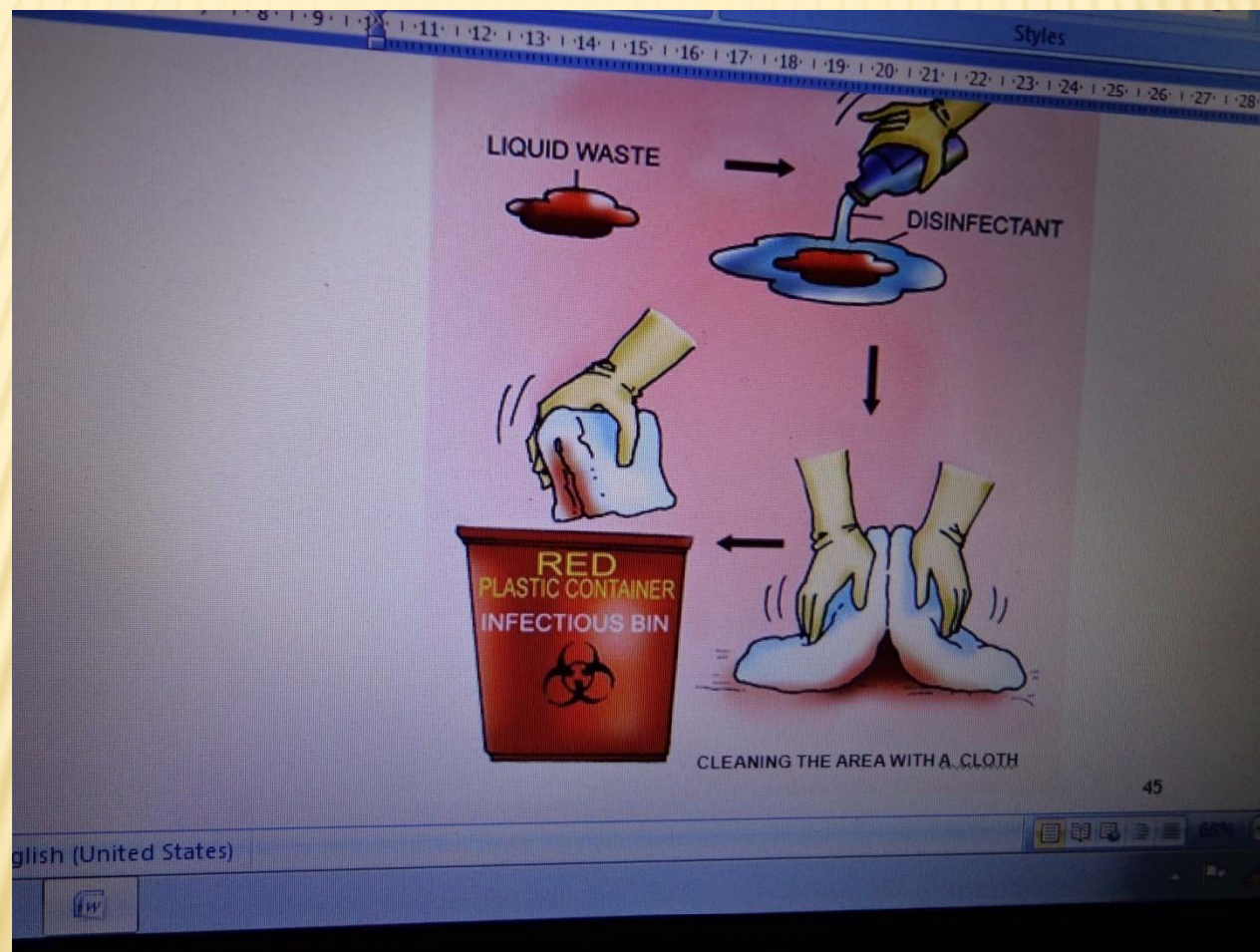


# SPUTUM CUPS AND SLIDES



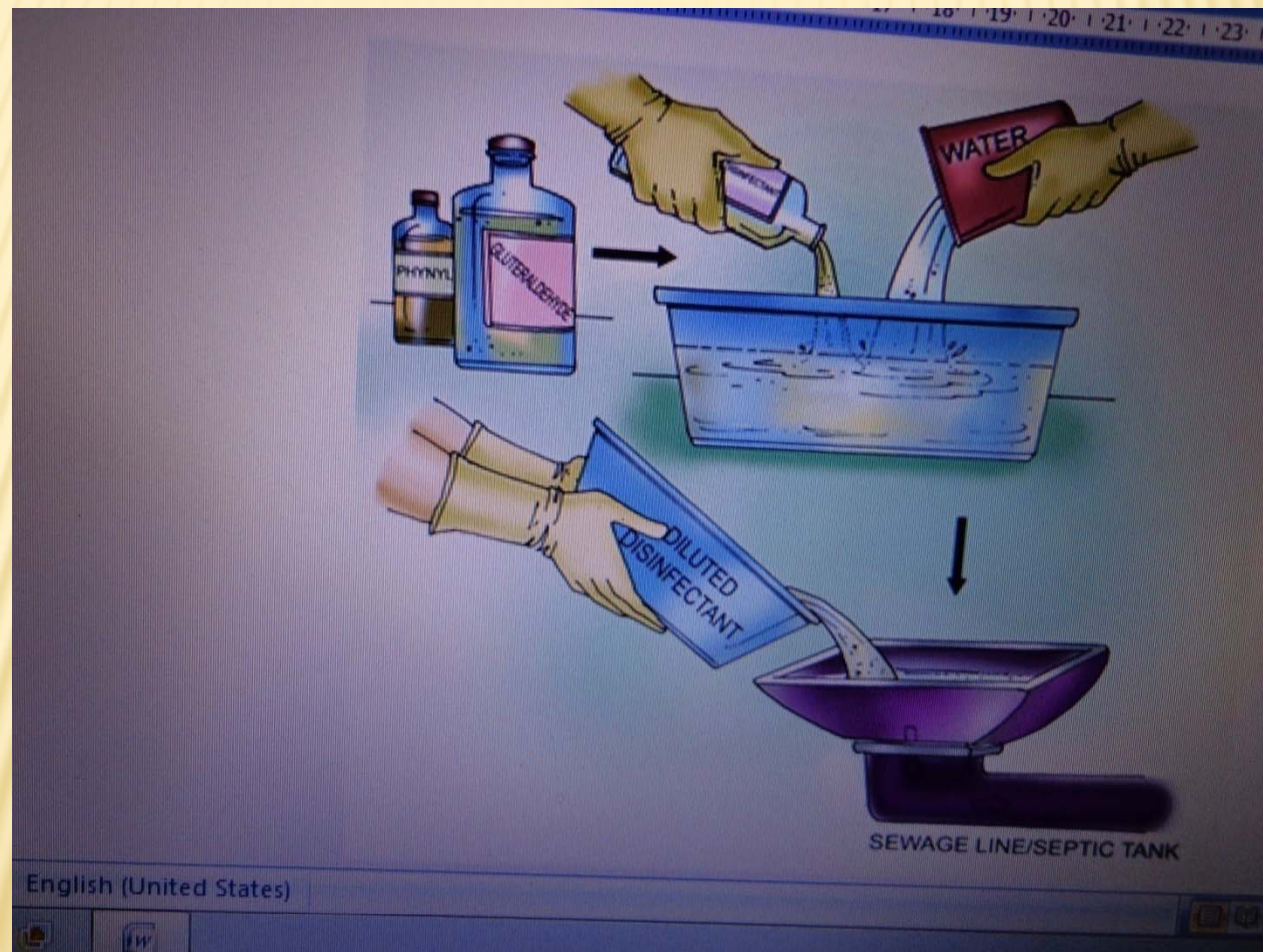


# LIQUID WASTE SPILLS

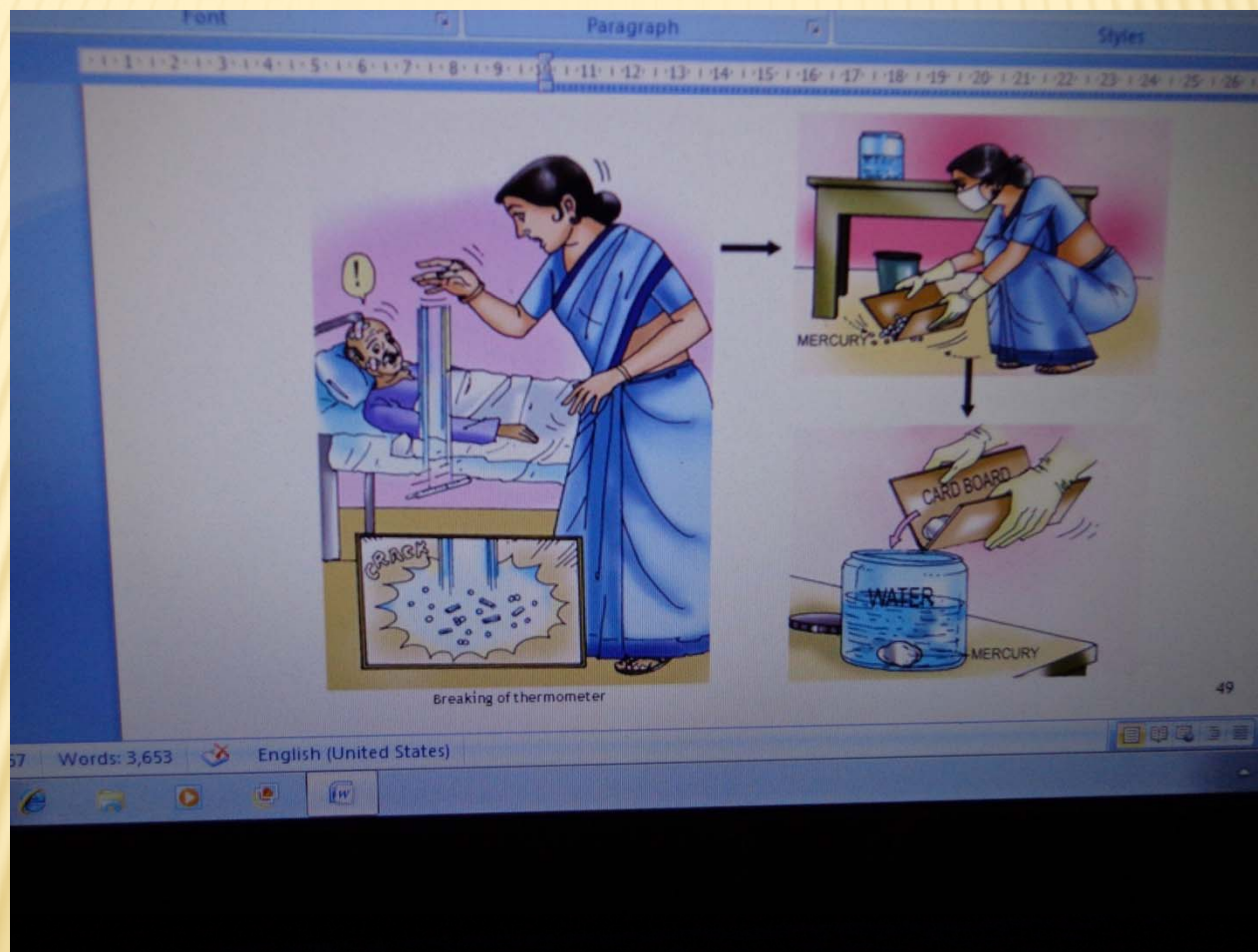




# DISPOSAL OF DISINFECTANTS

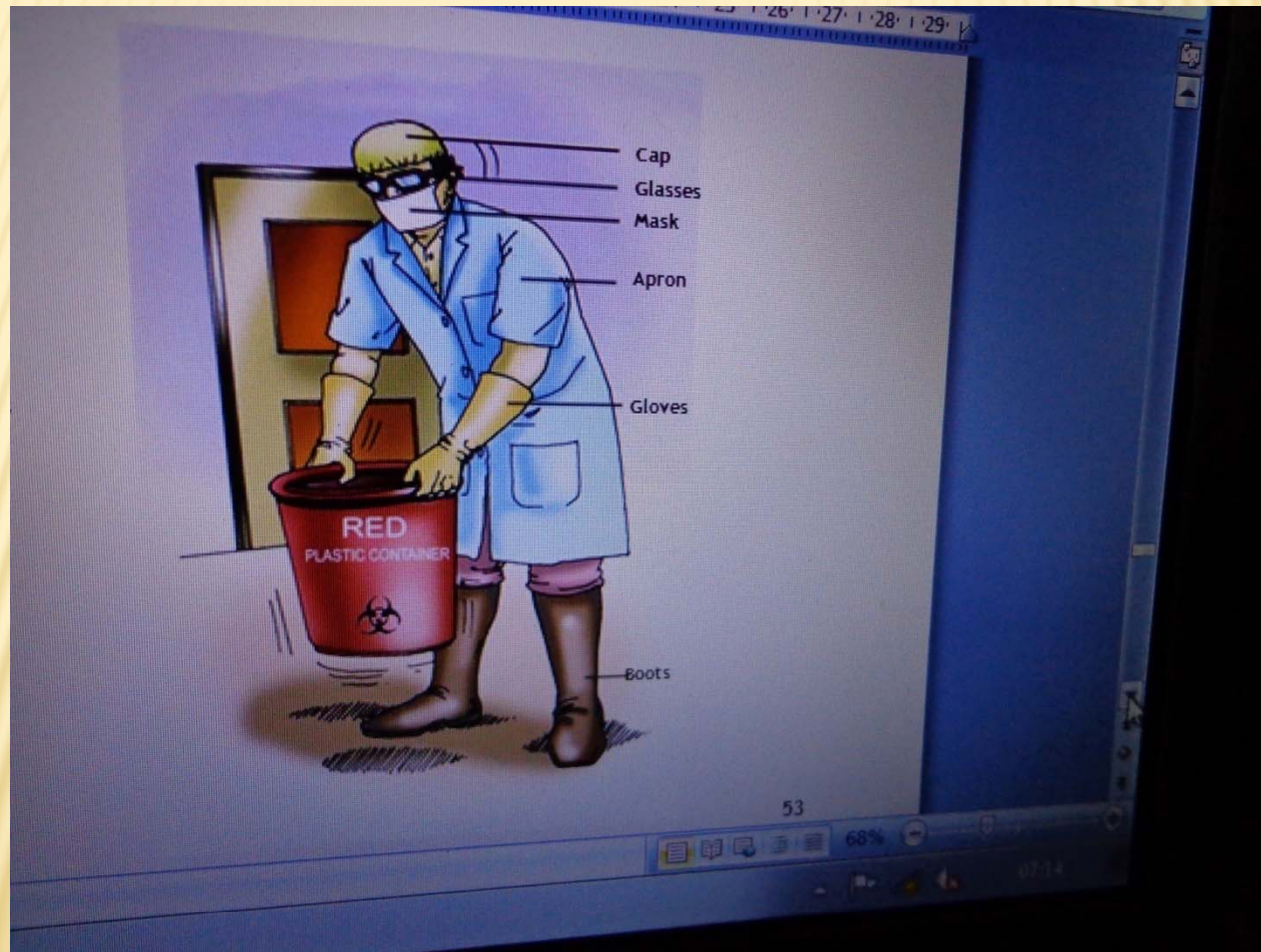


# MERCURY SPILLS



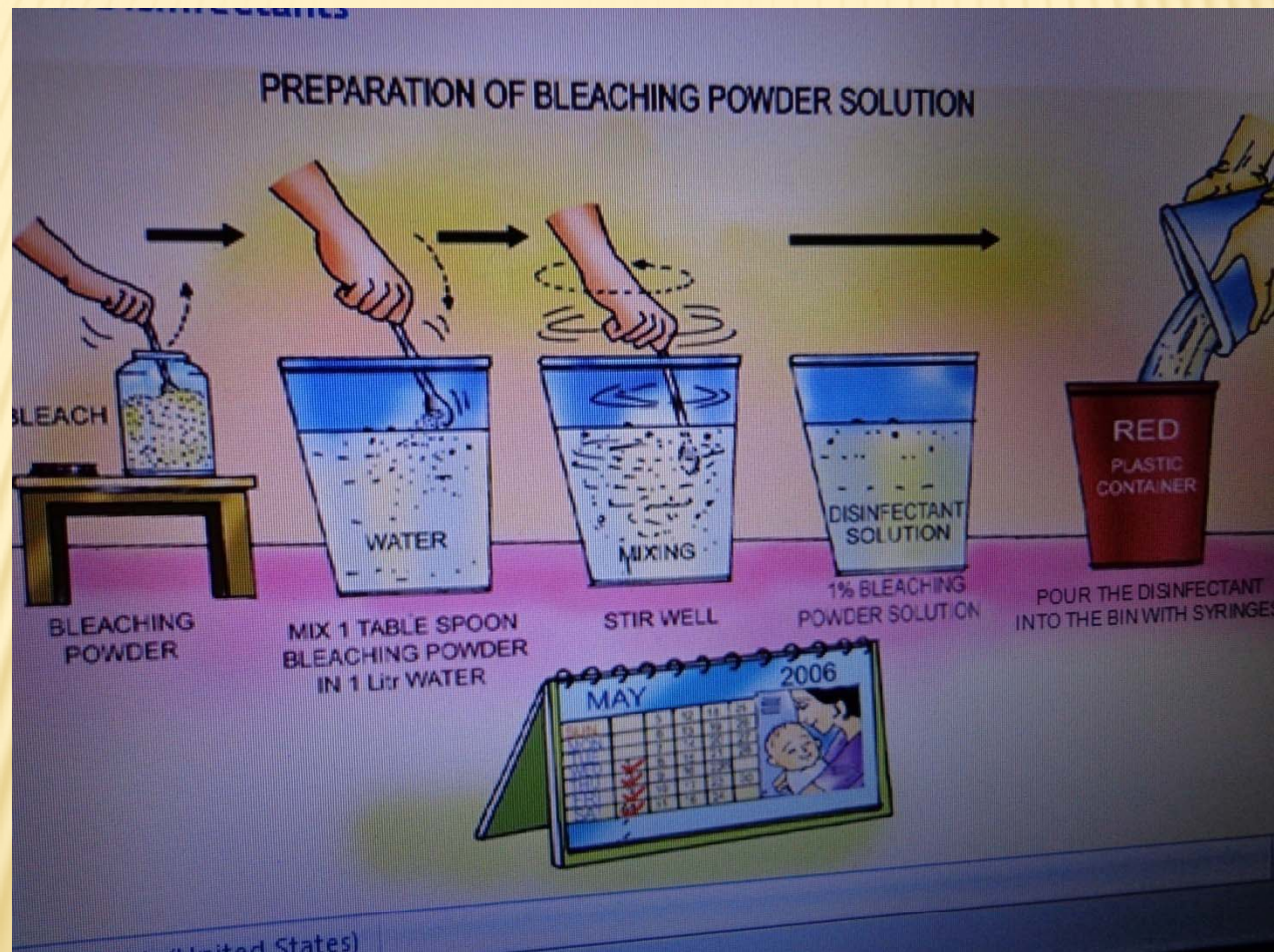


# PERSONAL PROTECTIVE EQUIPMENT

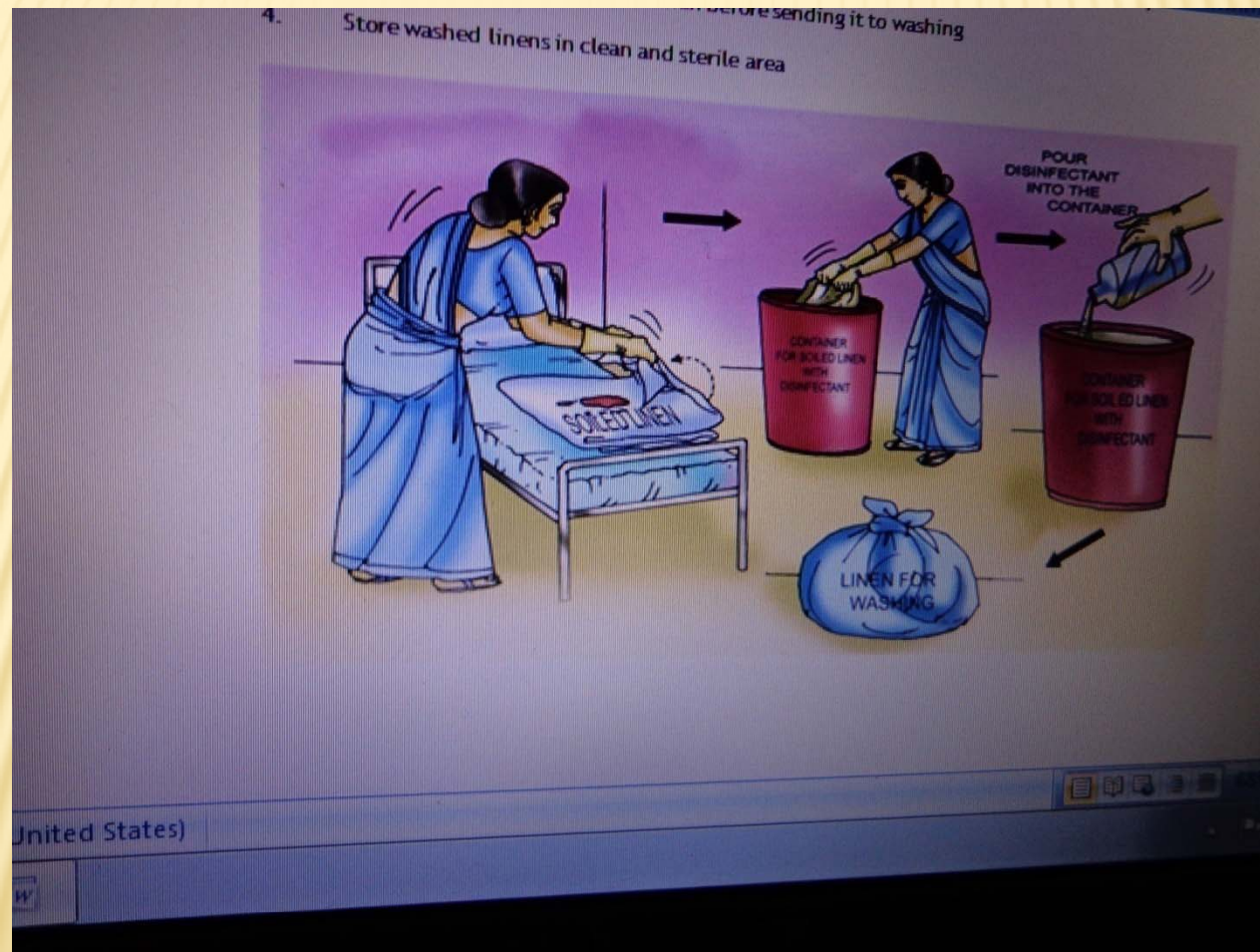




# USE OF DISINFECTANT

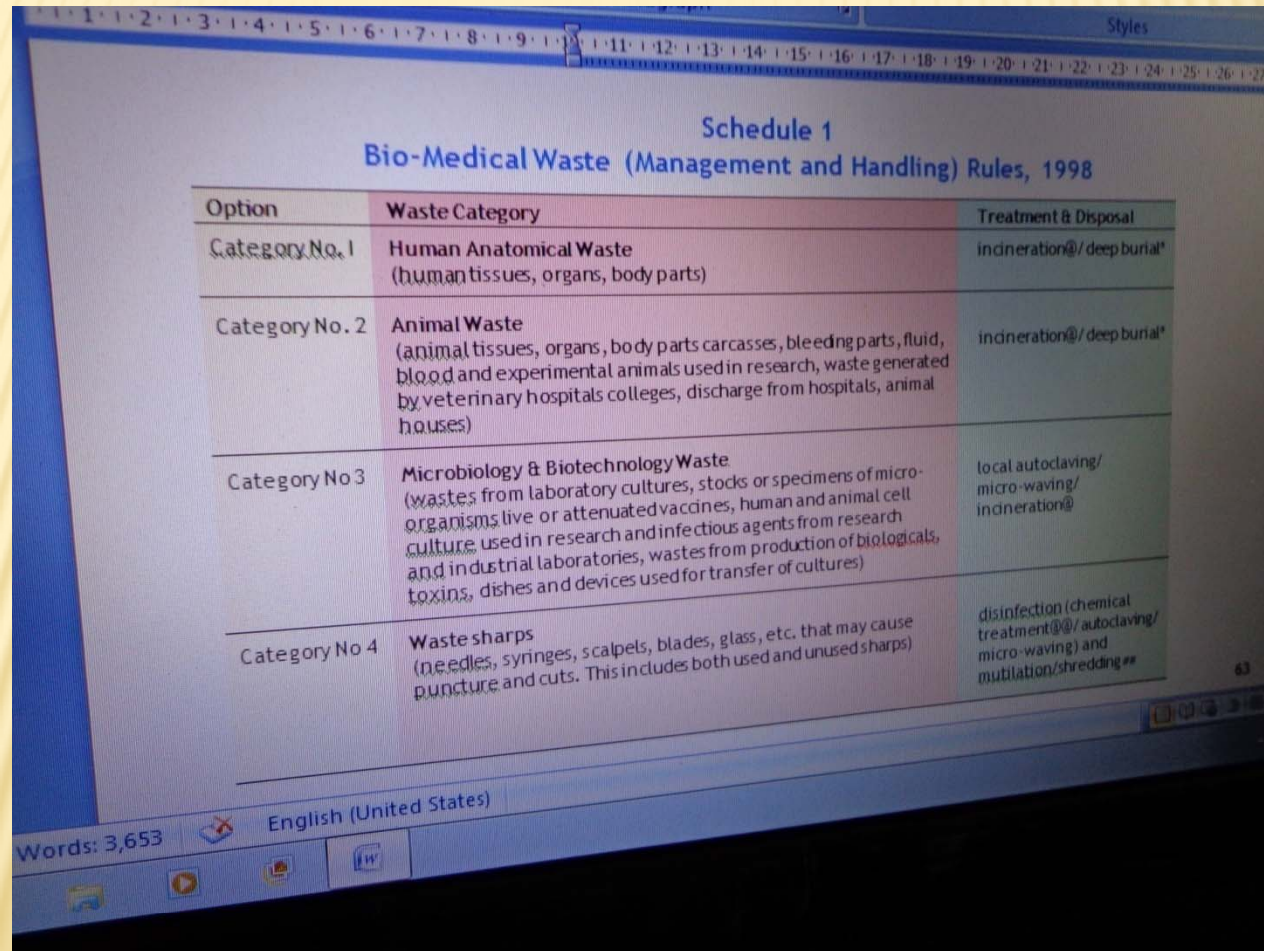


# SOILED LINEN MANAGEMENT





# ANNEXURE



**Schedule 1**  
**Bio-Medical Waste (Management and Handling) Rules, 1998**

Option	Waste Category	Treatment & Disposal
Category No. 1	<b>Human Anatomical Waste</b> (human tissues, organs, body parts)	incineration@/ deep burial*
Category No. 2	<b>Animal Waste</b> (animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals colleges, discharge from hospitals, animal houses)	incineration@/ deep burial*
Category No 3	<b>Microbiology &amp; Biotechnology Waste</b> (wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer of cultures)	local autoclaving/ micro-waving/ incineration@
Category No 4	<b>Waste sharps</b> (needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps)	disinfection (chemical treatment@@/ autoclaving/ micro-waving) and mutilation/shredding##

Words: 3,653 English (United States)



Option	Waste Category	Treatment & Disposal
Category No 5	Discarded Medicines and Cytotoxic drugs (wastes comprising of outdated, contaminated and discarded medicines)	incineration@/destruction and drugs disposal in secured landfills
Category No 6	Solid Waste (Items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, lines, beddings, other material contaminated with blood)	incineration@ autoclaving/microwaving
Category No. 7	Solid Waste (wastes generated from disposable items other than the waste sharps such as tubings, catheters, intravenous sets etc).	disinfection by chemical treatment@@autoclaving/ microwaving and mutilation/shredding##
Category No. 8	Liquid Waste (waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities)	disinfection by chemical treatment@ and discharge into drains
Category No. 9	Incineration Ash (ash from incineration of any bio-medical waste)	disposal in municipal landfill
Category No. 10	Chemical Waste (chemicals used in production of biologicals, chemicals used in disinfection, as insecticides, etc.)	chemical treatment@@ and discharge into drains for liquids and secured landfill for solids

@@: Chemicals treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

## Schedule 2 Bio-Medical Waste (Management and Handling) Rules, 1998

Colour Coding	Type of Container - I Waste Category	Treatment options as per Schedule I
Yellow	Plastic bag Cat. 1, Cat. 2, and Cat. 3, Cat. 6.	Incineration/deep burial
Red	Disinfected container/plastic bag Cat. 3, Cat. 6, Cat. 7.	Autoclaving/Microwaving/ Chemical Treatment
Blue/White translucent	Plastic bag/puncture proof Cat. 4, Cat. 7. Container	Autoclaving/Microwaving/ Chemical Treatment and destruction/shredding
Black	Plastic bag Cat. 5 and Cat. 9 and Cat. 10. (solid)	Disposal in secured landfill

### Notes:

1. Colour coding of waste categories with multiple treatment options as defined in Schedule I, shall be selected depending on treatment option chosen, which shall be as specified in Schedule I.
2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.



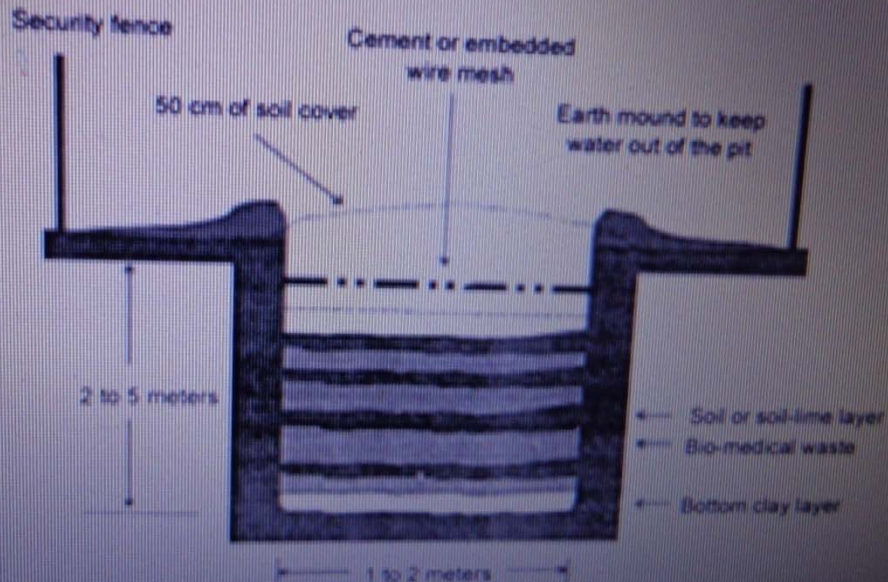
# DEEP BURIAL PIT

performed under close and dedicated supervision.  
The site should be relatively impermeable and no shallow well should be

be distant from  
sited so as to  
contamination  
surface water or  
The area should  
to flooding or

the deep  
be authorised  
ed authority.

shall maintain  
pits for deep



NOT DRAWN TO SCALE



# ACCIDENT REPORTING

**Form III (Accident Reporting)**  
**Bio-Medical Waste (Management and Handling) Rules, 1998**

1. Date and time of accident;....
2. Sequence of events leading to accident;....
3. The waste involved in accident;....
4. Assessment of the effects of the accidents on human health and the environment;....
5. Emergency measures taken;....
6. Steps taken to alleviate the effects of accidents;....
7. Steps taken to prevent the recurrence of such an accident

Date ..... Signature....

Place... .. Designation...

Words: 3,653 English (United States)

# SEGREGATION

**लाल कुड़ादान—** ब्यवहार किये गये—प्लास्टिक सिरिंज, प्लास्टिक, दासताना, सलाईन सेट, प्लास्टिक बोतल, कैथेटर, पेशाब का थैला, कटा हुआ प्लास्टर, बैंडेज, रूई, गॉज, लीकोप्लास्ट माइक्रोपोर, स्काल्प भेन सेट, कैटगेट, धागा, ड्रेनेज ट्यूब, राईल्स ट्यूब वगैरह।

**पीला कुड़ादान—** खून, सीरम मवाद, बलगम, कटा एवं सड़ा हुआ शरीर का अंग, खून से लथपथ कपड़ा एवं रूई, ड्रेसिंग पैड, कॉटेन स्वाव सैनीटरी पैड, प्लेसेंटा वगैरह।



## CONT...

**काला कुड़ादान—** कागज, खाना, फल का छिल्का, फर्श साफ करने के पश्चात कुड़ा, सिरींज एवं सलाईन का प्लास्टिक कभर, कार्टून, कॉफी, चाय का कप, अन्य कोई ठोस इत्यादि।

**सफेद कुड़ादान—**नुकीला सामान जैसे सूई, नीडील (कटा हुआ) ब्लेड, ऐम्पुल, टूटा हुआ काँच का टुकड़ा एवं बोतल, ब्यवहार किया गया वायल का उपर वाला मेटैलीक कैप, व्यवहार किये गये खाली वायल को अलग डब्बे में रखना है जिसे पुनः Sterlise कर उपयोग में लाया जा सके।

# THANK YOU

