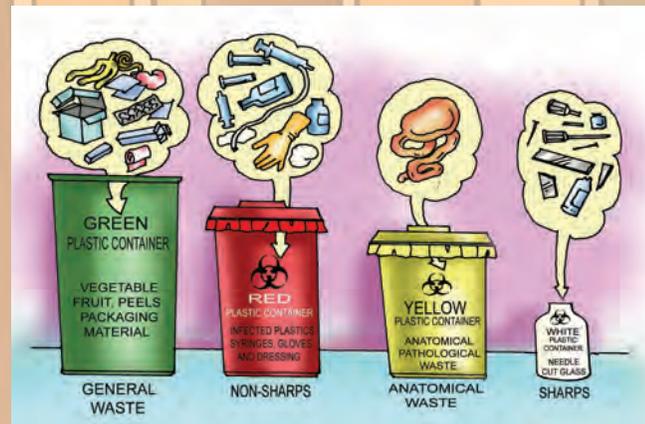
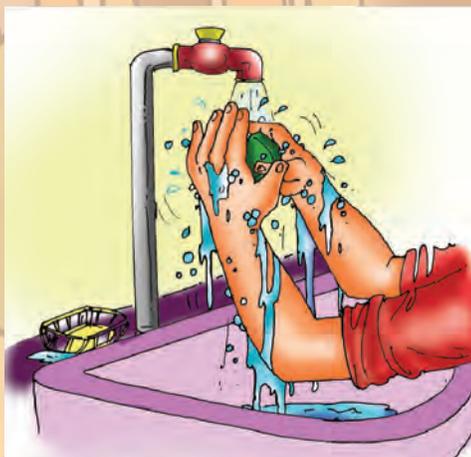




INFECTION MANAGEMENT AND ENVIRONMENT PLAN

GUIDELINES FOR HEALTHCARE WORKERS FOR WASTE MANAGEMENT AND INFECTION CONTROL IN SUB-CENTRES



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Ministry of Health & Family Welfare
Government of India



The World Bank

This Document has been designed by Arvinder Chawla and Kamal Kumar, illustrated by Vivek Kaushik and printed by Colorcom Advertising

2007, Printing of the IMEP guidelines for Government of India is supported by DFID, India.

Preface

Biomedical waste refers to all wastes generated from healthcare and health research facilities and associated laboratories. While most of this is communal waste, a small percentage can be deemed infectious and/or hazardous. These include infected sharps and wastes with infectious, hazardous, radioactive, or genotoxic characteristics, which if inadequately treated and managed can have adverse impact on the environment and on public health through air, land and water pollution. Therefore institutionalizing effective waste management systems in all healthcare facilities is a key prerequisite to improving efficiency and effectiveness of healthcare.

The regulatory framework for environmental management in the health sector in India is provided by the Bio-Medical Rules (prepared in 1998; amended in 2000 and 2003), which apply to all persons/institutions generating and/or handling healthcare waste in any form. The Rules define bio-medical waste as “any waste which is generated during diagnosis, treatment or immunization of human beings or animals, or in research activities or in the production or testing of biologicals and including categories mentioned in schedule-I of the rules”. The Rules, besides identifying the various waste categories, also recommend treatment and disposal methods and the standards to be laid down for the same.

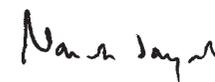
The Ministry of Health & Family Welfare commissioned the development of a National Policy document to address the issues relating to infection control and waste management and define a framework for implementation of an Infection Management and Environment Plan (IMEP) in healthcare facilities. This policy document was commissioned under the Reproductive and Child Health Programme Phase - II, with technical and financial support from DFIDI and the World Bank.

The final IMEP document comprises of **2 volumes**:

- ❖ A **Policy Framework document** which gives a broad overview and contains generic guidance to central and state level institutions on the type of systems and processes to be established for infection control and biomedical waste management.
- ❖ A set of **Operational Guidelines** which are designed as instruction manuals for healthcare workers at primary level healthcare facilities, i.e. Community Health Centres, Primary Health Centres and Sub Centres. These guidelines are in the form of simple pictorial presentations of the various steps needed to manage infectious waste in a hygienic, safe and environmentally sound manner.

The IMEP Guidelines will be implemented and monitored under the auspices of the National Rural Health Mission (NRHM) and will go a long way to internalise state-of-the art, best practices in managing health and environment risks in the healthcare institutions of our country.

Date: 1st April, 2007



(Naresh Dayal)

Secretary (Health and Family Welfare)
Ministry of Health and Family Welfare
Government of India

Acknowledgement

The Infection Management and Environment Plan document is an important component of the support to primary level healthcare being provided under the auspices of the National Rural Health Mission (NRHM) and Reproductive and Child Health Programme Phase - II. The Policy Framework document and the Operational Guidelines are intended to facilitate and enhance implementation of the Bio-Medical Waste Management Rules of the Government of India.

The vision and constant encouragement provided by Shri P.K. Hota, former Secretary, Health and Family Welfare enabled us to bring out these guidelines. I express my sincere thanks to Shri Naresh Dayal, Secretary, Health & Family Welfare under whose leadership these guidelines have been finalized.

Special thanks are also due to Ms. Ruma Tavorath, Environment Specialist, The World Bank, for her technical contribution and continued guidance to bring the document to its current shape. We are particularly thankful to Dr. Sean Doolan, Environment Adviser, DFIDI who conceptualized this document and to Mr. Stephen Young, Senior Infrastructure and Urban Development Adviser, DFIDI for the continued support. Ms. Ellora Guhathakurta, Programme officer, DFIDI deserves special mention for her meticulous and sustained follow-up and coordination throughout the administrative process.

I recognize the excellent contributions of Mr. S. Vaideeswaran, Consultant, The World Bank and Dr. Megha Rathi, Consultant, DFIDI in successfully translating the concepts of the Policy Framework and Operational Guidelines into reality. Sincere appreciation is due to Shri S.S. Brar, Joint Secretary (RCH) and Shri A.P. Singh, Director (DC) for their leadership, encouragement and guidance.

I acknowledge the contributions of Dr. V.K. Manchanda, erstwhile Deputy Commissioner (MCH), Dr. Narika Namshum, Deputy Commissioner (Child Health and Training),

Dr. I.P. Kaur, Deputy Commissioner (Maternal Health) and Dr. Himanshu Bhushan, Assistant Commissioner (Maternal Health).

I would like to make a special mention of Dr. Manisha Malhotra, Assistant Commissioner, Maternal Health Division, for her unstinting support and unwavering commitment to finalizing, disseminating and enhancing the importance of this activity within the NRHM agenda.

The cooperation and technical inputs provided to this activity by the members of the "Working Group" deserves special mention. So does the contribution of the secretarial staff from the various organizations who have facilitated us in this important activity.

Date: 1st April, 2007



(S. Jalaja)

Additional Secretary
Mission Director, NRHM
Ministry of Health & Family Welfare
Government of India

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Waste Management in Sub-centres

A Sub-centre caters to a population of around 5000 in plain areas and for every 3000 in hilly/tribal/desert areas. The Sub-centre undertakes various activities like immunization, antenatal and postnatal care, family planning procedures, institutional deliveries and providing treatment for minor ailments including fever, Diarrhea, ARI, worm infestation and First Aid. These activities generate different kinds of waste that need to be managed as per the Bio-medical Waste (Management and Handling) Rules, 1998. As the rules make it mandatory for all health care facilities to have a sound health care waste management system. The present guidelines are intended to help the health care workers manage their waste and safeguard themselves and the community from the ill-effects of contaminated waste at the Sub-centre level.

A Sub-centre generates different kinds and quantity of waste based on the activities undertaken by it. The following table explains in brief the different areas and types of waste generated in a Sub-centre.

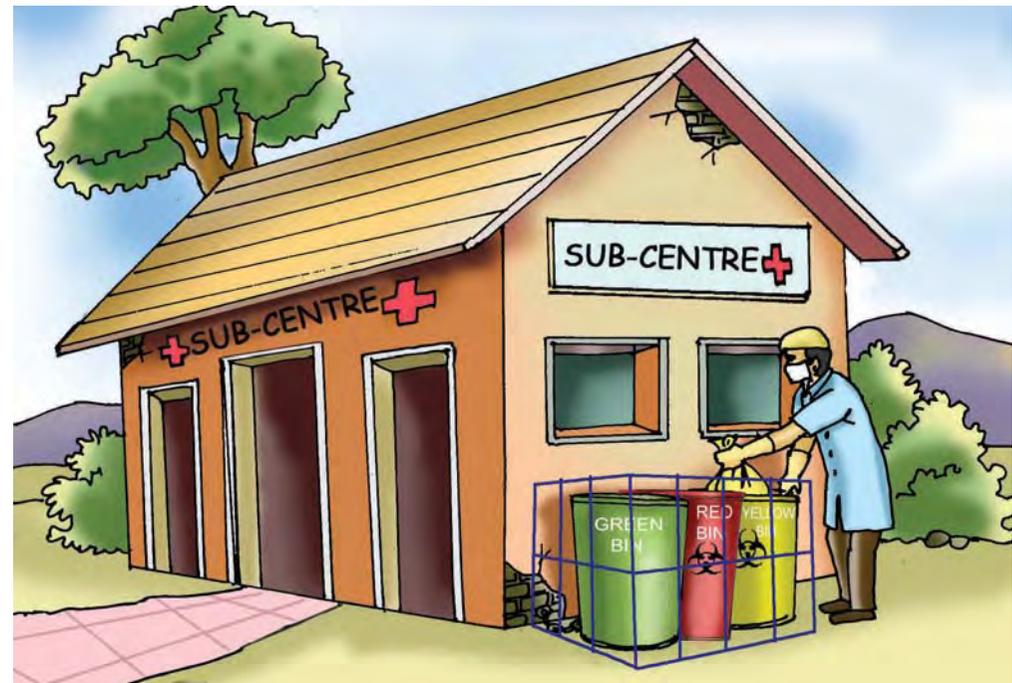
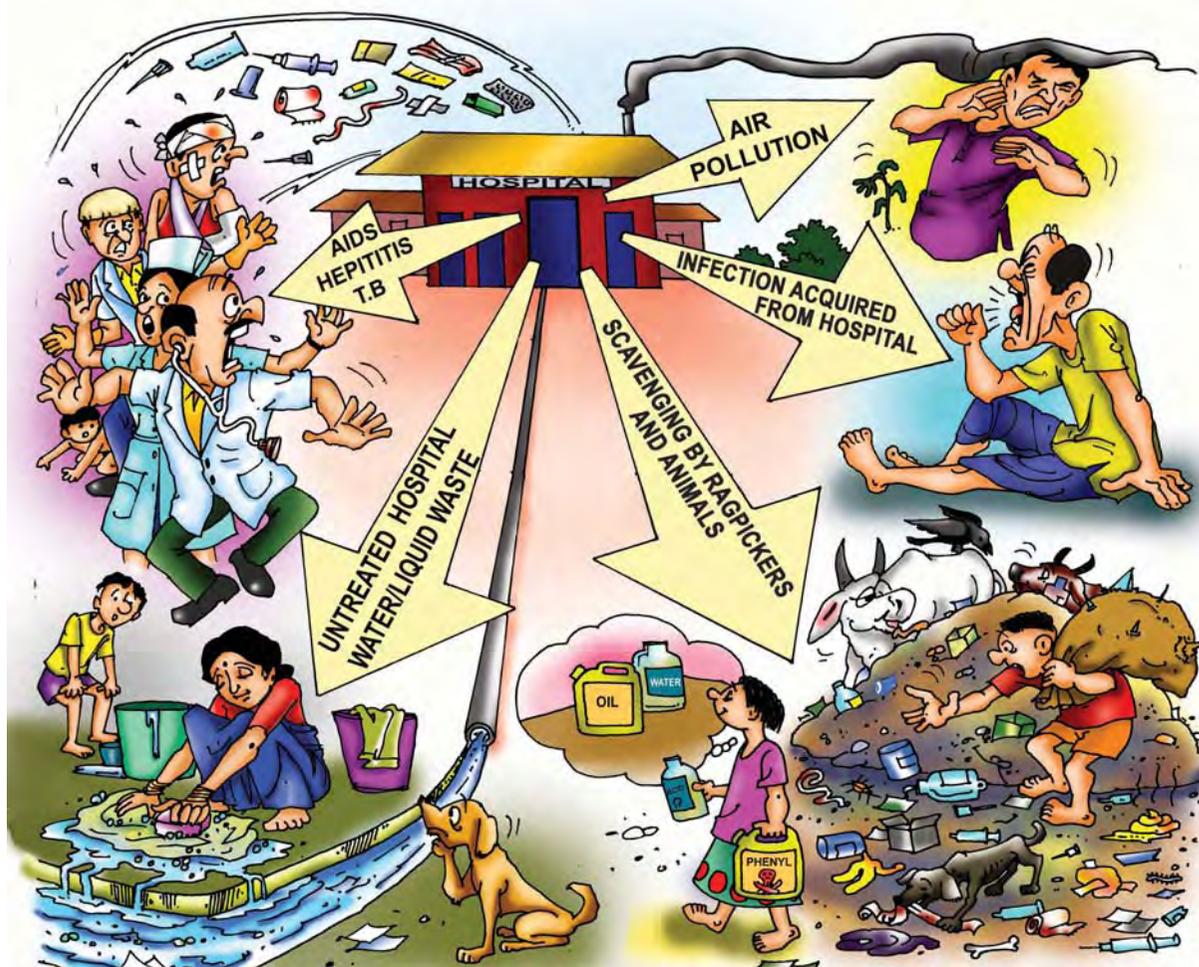


Table: Areas of waste generation and kinds of waste generated in the Sub-Centres

| S.No. | Areas of Waste generation | Activities performed | Types of Waste generated* | Consumables used for Managing Waste |
|-------|---------------------------|---|--|--|
| 1. | Labour Room | Child birth (Deliveries) | Placenta, blood and body fluids, soiled waste, cotton, swabs, syringes and needles, blades, masks and gloves | Coloured plastic bags, bins, puncture proof container, chemical disinfectant and hub cutter. |
| 2. | Clinic | Out-patient services, routine examination of patients, family planning services, curative and immunization injections | Syringes and needles, slides and lancets, ampoules, vials, blood and body fluids, broken glasses and gloves, swabs and liquid waste. | - do- |
| 3. | Outreach sessions | Antenatal and postnatal care (Immunization), routine patient care | Syringes and needles, cotton swabs, lancets and slides. | Plastic bags and puncture proof container |

** General or non-biomedical waste is generated at all the points of waste generation in the health care facility*

To manage the waste generated in the Sub-centres and the outreach sessions a system of waste management needs to be adapted by a Sub-centre that is safe for the health care workers and the community, easy to operate and economically viable. For the easy understanding and implementation of waste management system in Sub-centres the various steps for waste management have been depicted in the form of illustrations. These illustrations are self-explanatory and are aimed at helping the health care workers to manage the waste as per the Bio-medical Waste (Management and Handling), Rules 1998.



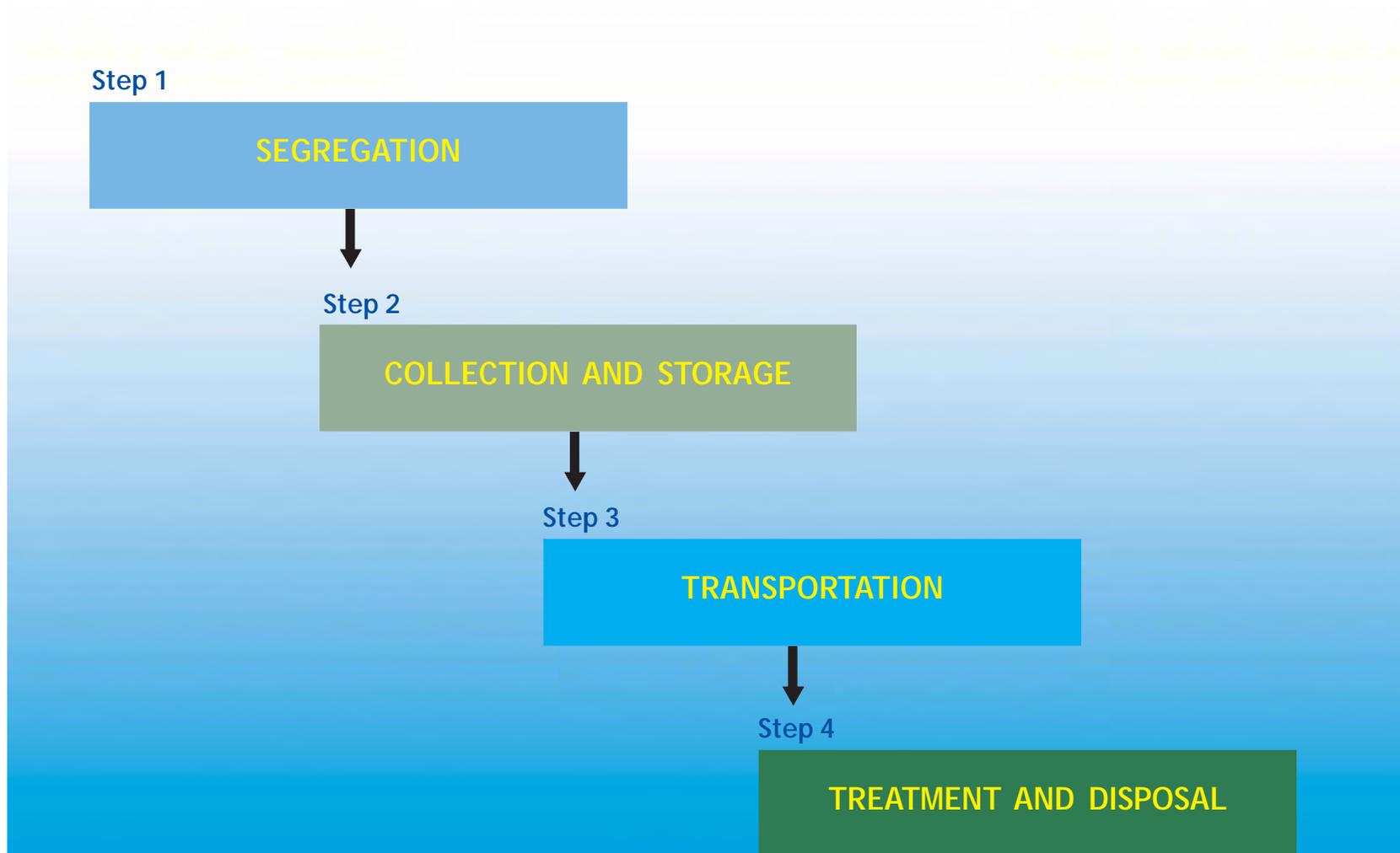
Health care waste is a risk to all, it affects us in different ways



Waste Management



1. Steps For Waste Management



1.1 Segregation

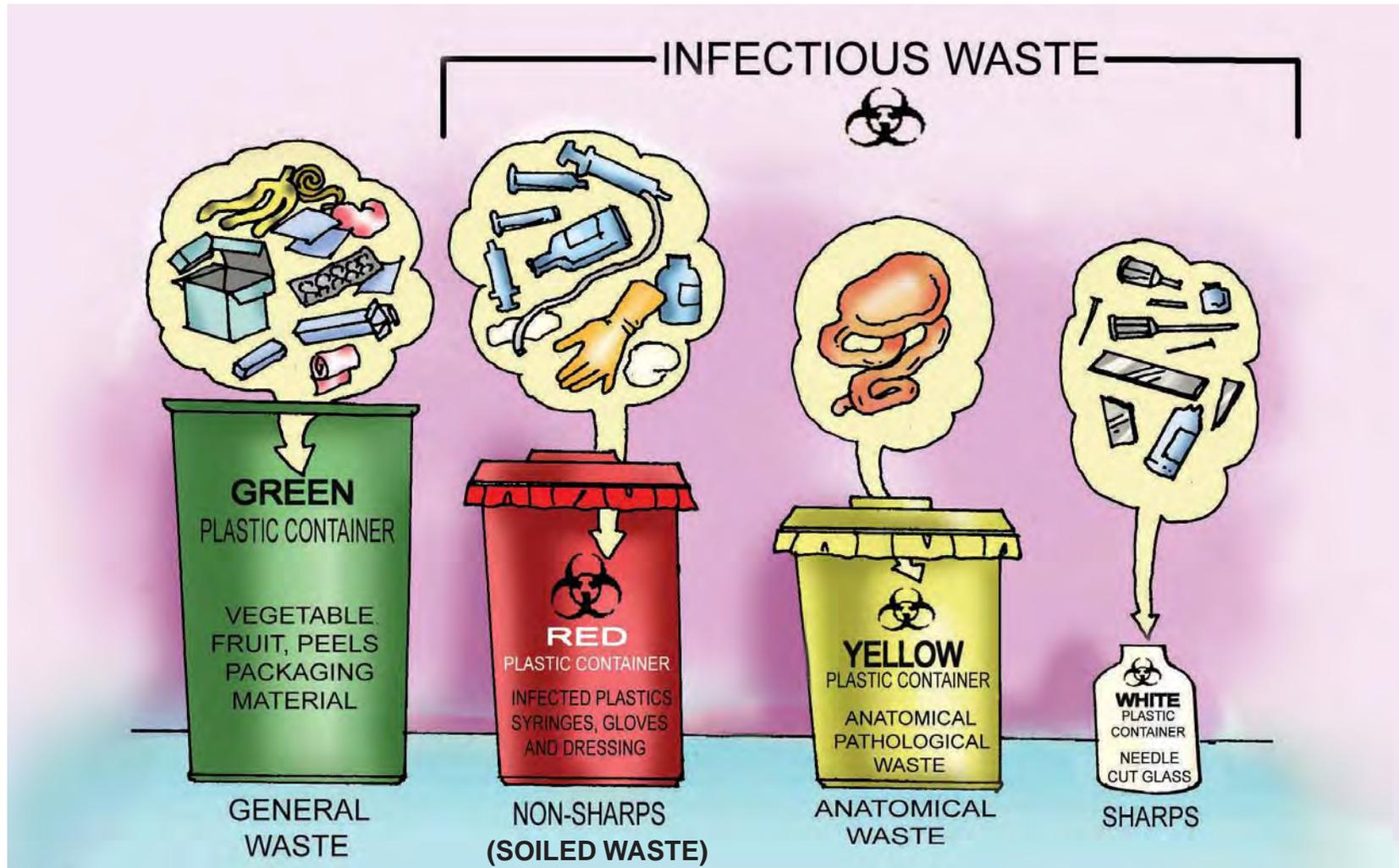
Do's

1. Always segregate waste into infectious and non-infectious waste at source of generation in the Sub-centre or during outreach sessions
2. Segregate infectious waste into:
 - a. Sharps like needles, blades, lancets, broken ampoules, vials, slides in puncture proof container
 - b. Non-Sharps (soiled waste) like syringes, dressings, gloves, mask, these are to be disposed in red plastic bins/bags
 - c. Anatomical waste like placenta in yellow plastic bins/bags
3. Non-infectious (General) waste like waste similar to household waste including packaging material, cartons, fruit and vegetable peels, syringe and needle wrappers, medicine covers in green/black plastic bins or bags

Don'ts

Never mix infectious and non-infectious waste at source of generation, during waste collection, waste storage, waste transportation or during final disposal of waste

Segregation



Always segregate waste at the source of generation

1.2 Collection and Storage

Do's

1. Always collect the waste in covered bins
2. Fill the bins upto the 3/4th level
3. Clean the bins regularly with soap and water

Don'ts

1. Never overfill the bins
2. Never mix infectious and non-infectious waste in the same bin
3. Never store waste beyond 48 hrs

Collection and Storage



Bad - Mixing of waste



Good - Store waste in secure containers/bags

1.3 Transportation

Do's

1. Always carry/transport the waste in closed containers from the source of generation to final disposal. Like while carrying waste from the outreach session to the Sub-centres and from the Sub-centres to the Primary Health Centre (PHC), carry the waste in a closed container
2. Use dedicated waste collection bins for transporting waste

Don'ts

1. Never transport the waste in open containers or bags, it may spill and cause spread of infections
2. Never transport waste with sterile equipments.

Transportation



Bad - Don't carry waste in open bags, and never carry it through crowded areas



Good - Always carry the waste in secure sealed containers/bags

1.4 Treatment and Disposal

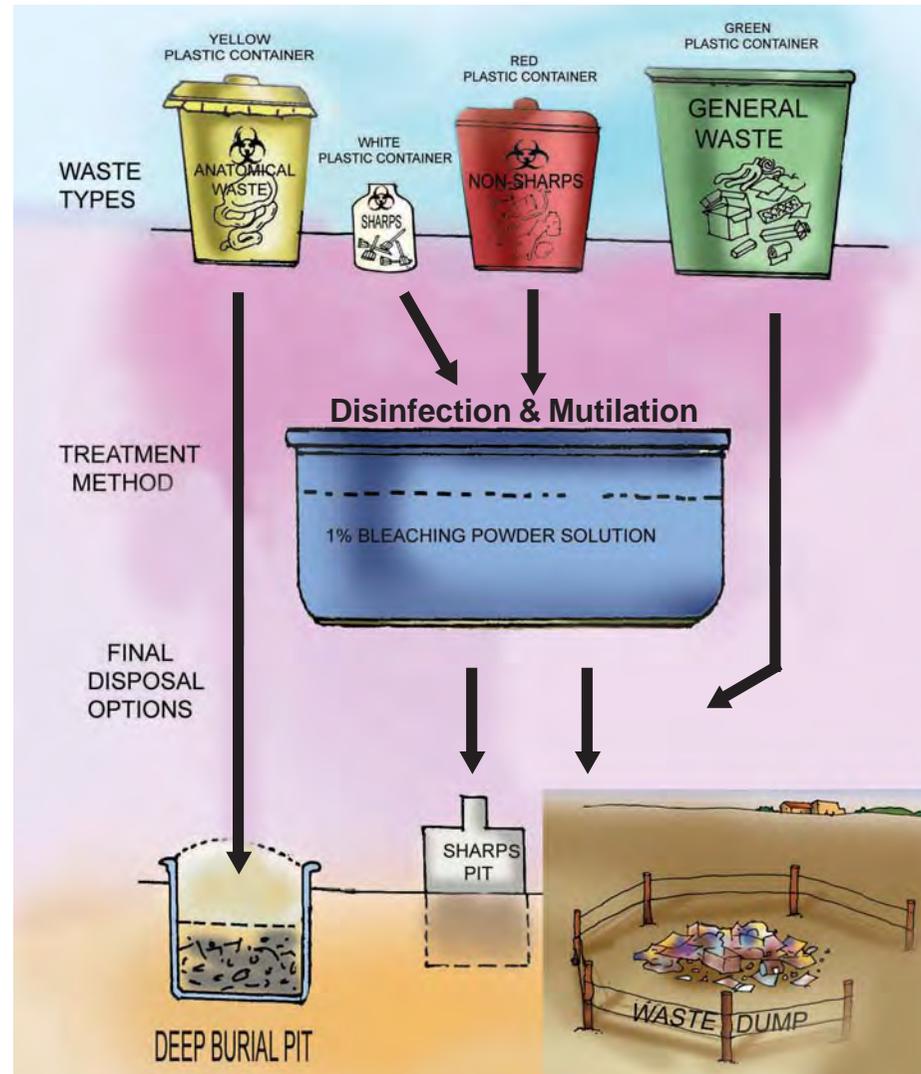
Do's

1. Always remember to disinfect and mutilate the waste before its final disposal
2. Remember the following while treating the waste streams
 - a. Anatomical waste to be deep buried at the Sub-centre
 - b. Syringes to be cut (with hub cutters) and chemically disinfected at source of generation before final disposal into sharps pit located at the PHC
 - c. Infected plastics to be chemically disinfected or autoclaved, shredded and recycled and sent for final disposal into municipal dumps
 - d. General waste to be sent to municipal dumps for final disposal

Don'ts

Never throw infectious waste into general waste without any pre-treatment and mutilation

Treatment and Disposal



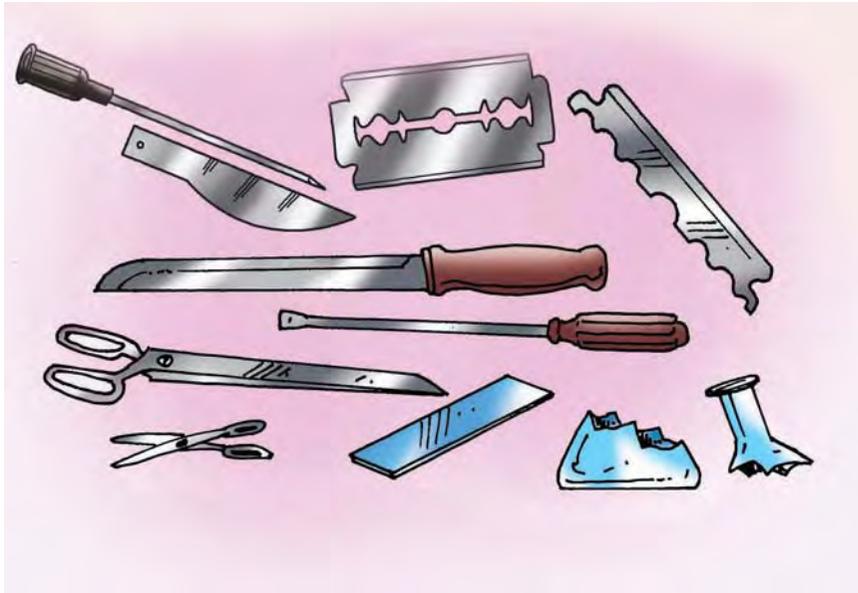
Ensure disinfection and mutilation of waste before final disposal

2. Management of Different Waste Streams

2.1 Sharps

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, lancets and blades and glass sharps like broken ampoules, vials and slides

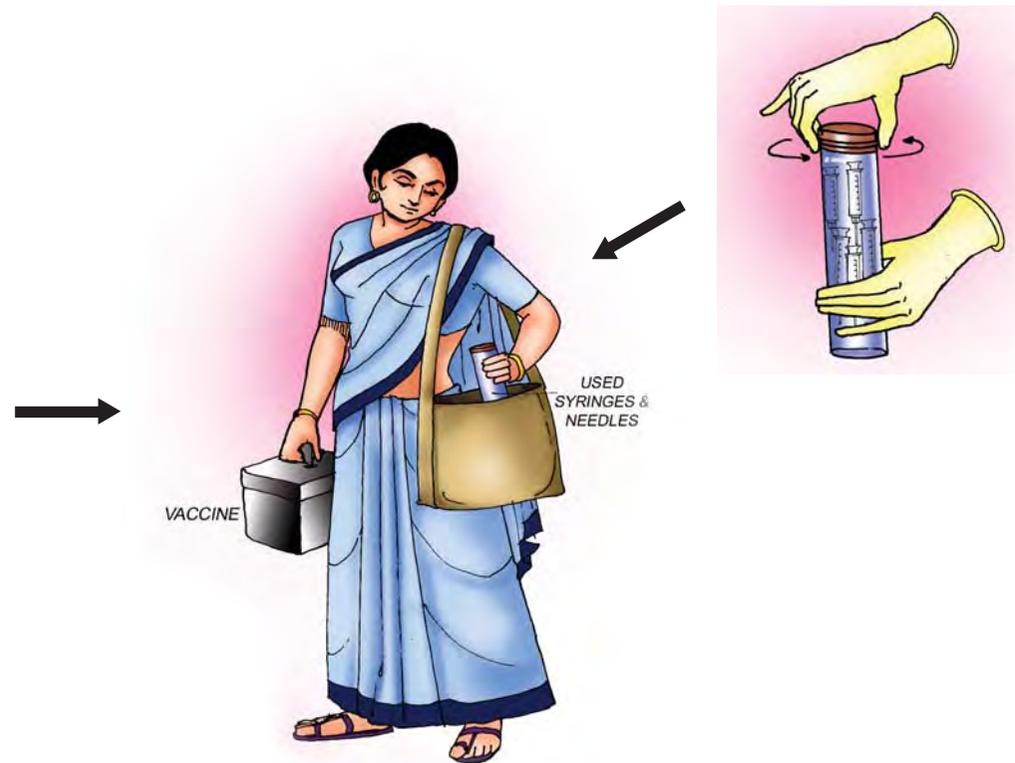


2.1.2 Different Kinds of Needles and Syringes

In the following pages the waste management of
a) Disposable syringes, b) Auto-disable syringes and c) Glass syringes has been illustrated
for an outreach session



Collect sharps in puncture proof containers in the outreach session



Carry the sharps from the outreach session in a puncture proof container to the sub-centre/PHC for disinfection and mutilation

a) Disposable Syringes

Do's

1. Always wear protective gears like gloves while handling needles and syringes
2. Always collect the needles and syringes in puncture proof containers
3. Carry the puncture proof container to the sub-centre or the PHC for mutilating/ cutting the tip of the syringe and the needle before disinfecting them with a needle and hub cutter
4. Disinfect the mutilated needles and the syringes with 1% bleaching powder solution for at least an hour
5. Detach the barrel and the plunger before disinfecting the syringe
6. Collect the mutilated and disinfected needles in puncture proof containers for final disposal in sharps pit located in the PHC
7. Final disposal of disinfected and mutilated syringes in general waste stream in PHC

Don'ts

1. Never mix sharps with other waste streams
2. Never throw needles and syringes without mutilation and disinfection into the waste bin
3. Never discard the sharps in non puncture proof containers like polybags
4. Never recap or bend the syringes
5. Never burn the syringes
6. Never dispose the syringes in open areas

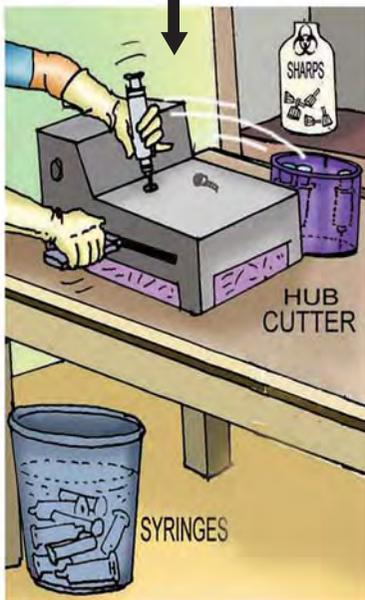


Disposable Syringes

Outreach session



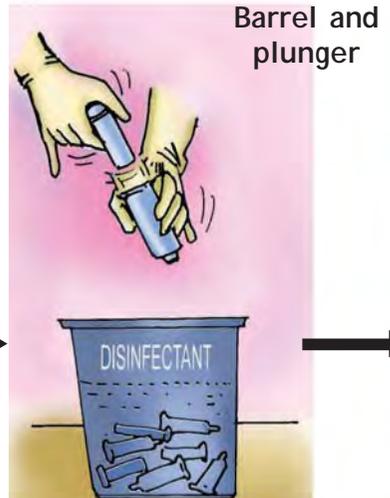
Sub-centre/ PHC



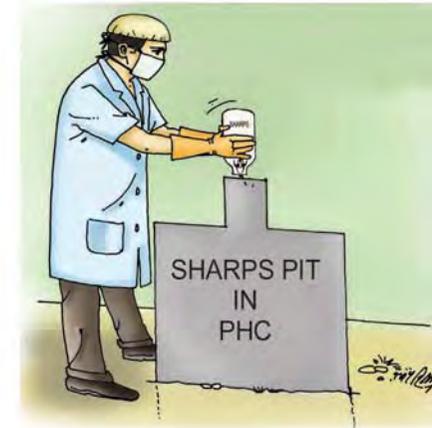
Mutilation of needles and syringes



Detach the Barrel and plunger



Disinfection of mutilated needles and syringes



General waste stream

b) Auto-disable Syringes

Do's

1. Always wear protective gears like gloves while handling needles and syringes
2. Always collect the auto-disable syringes after use in puncture proof containers for mutilation and disinfection at the Sub-centre or the PHC
3. Always mutilate/cut the tip of the syringe and the needle with a needle and hub cutter before disinfecting them
4. Disinfect the mutilated needles and the syringes with 1% bleaching powder solution for minimum of 1 hour
5. After disinfection and mutilation of needles collect them in puncture proof containers for final disposal in sharps pit located in PHC
6. Final disposal of disinfected and mutilated syringes in general waste stream/recycling

Don'ts

1. Never mix sharps with other waste streams
2. Never burn the syringes
3. Never dispose the auto-disable syringe in open areas accessible to scavengers



NEVER BURN SYRINGES

Auto-disable Syringes

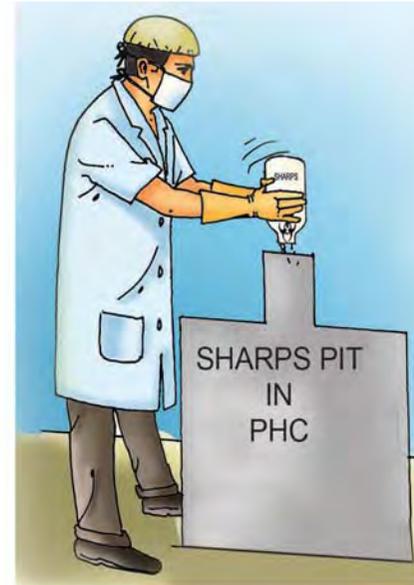
Outreach session



Sub-centre/ PHC



Mutilation of needles and syringes



Disinfection of mutilated needles and syringes



General waste stream

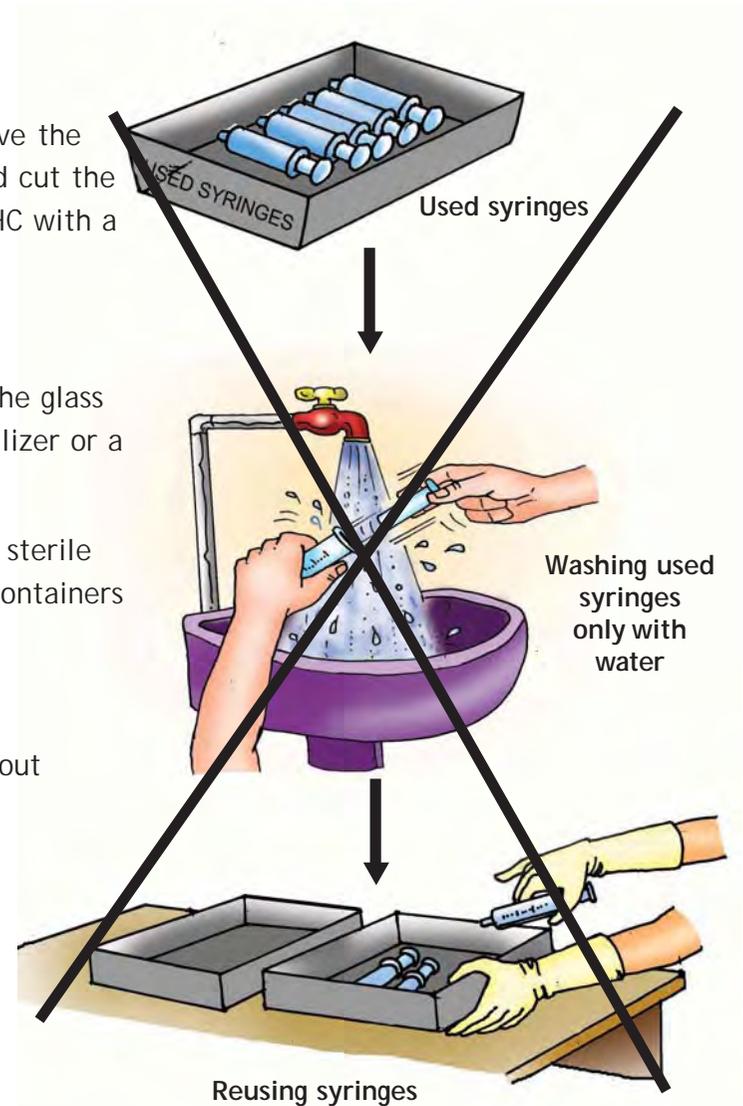
c) Glass Syringes

Do's

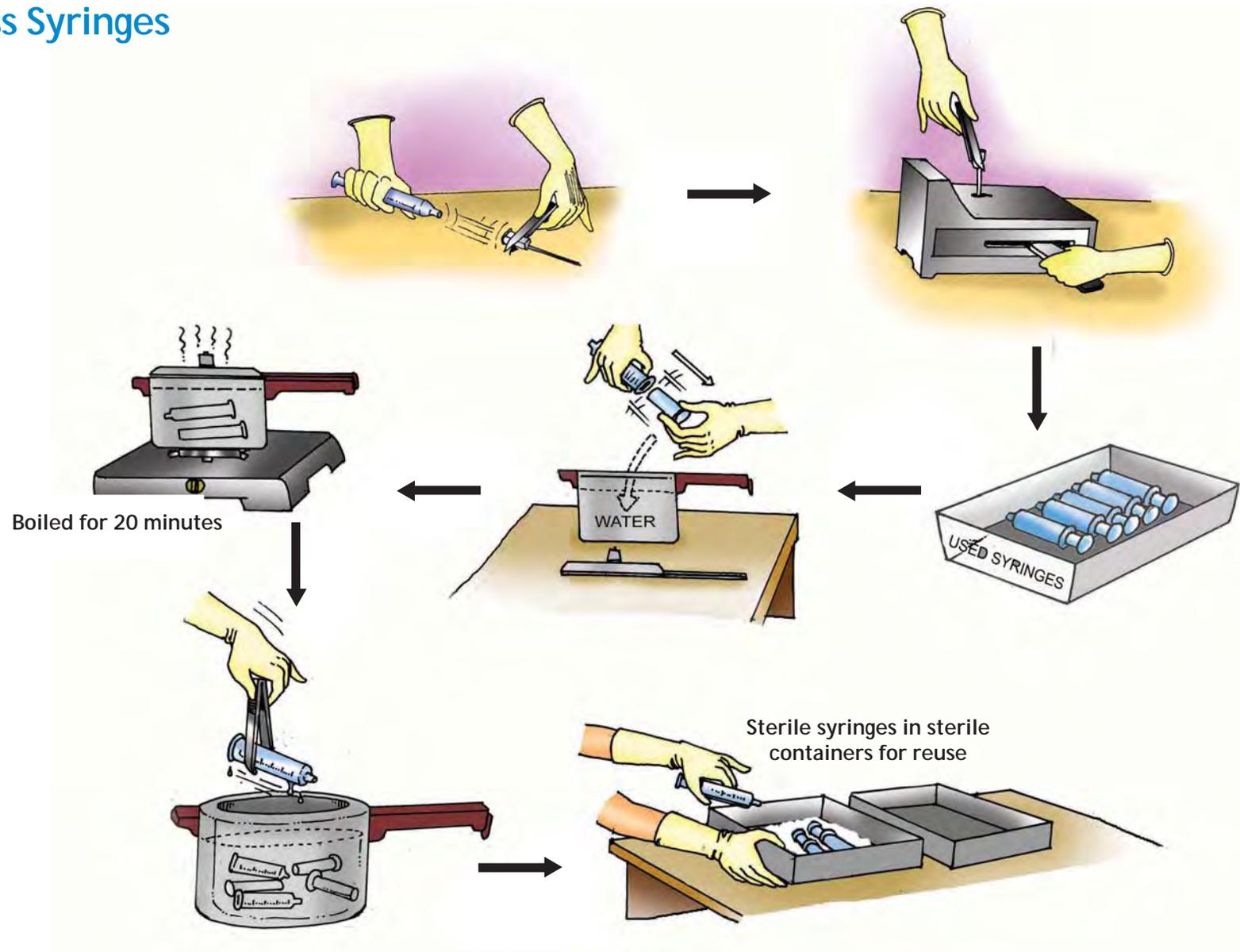
1. After using the glass syringes remove the needles at source of generation and cut the needles in the Sub-centre or the PHC with a needle cutter
2. Collect the glass syringes in a box
3. Remove the barrel and plunger of the glass syringe and sterilize them in a sterilizer or a cooker for at least 20 minutes
4. Remove the sterilized syringes with sterile forcipes and store them in sterile containers for reuse

Don'ts

1. Never reuse the glass syringes without proper sterilization. Ensure proper sterilization of the syringes
2. Never reuse the needles. Always single use the needles



Glass Syringes



2.1.3 Broken Glasses

Do's

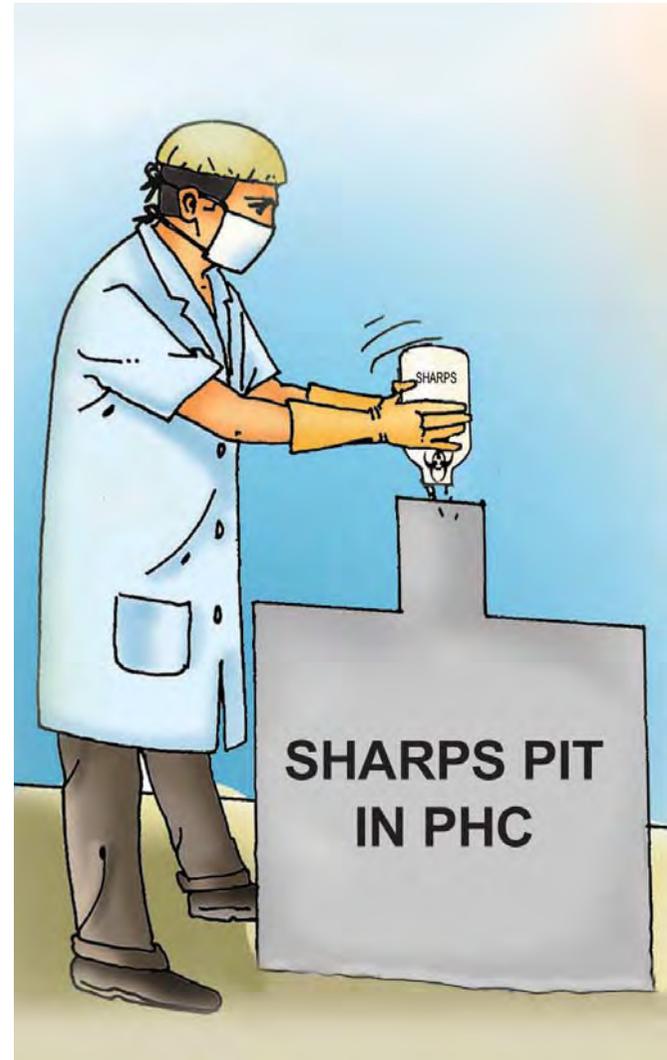
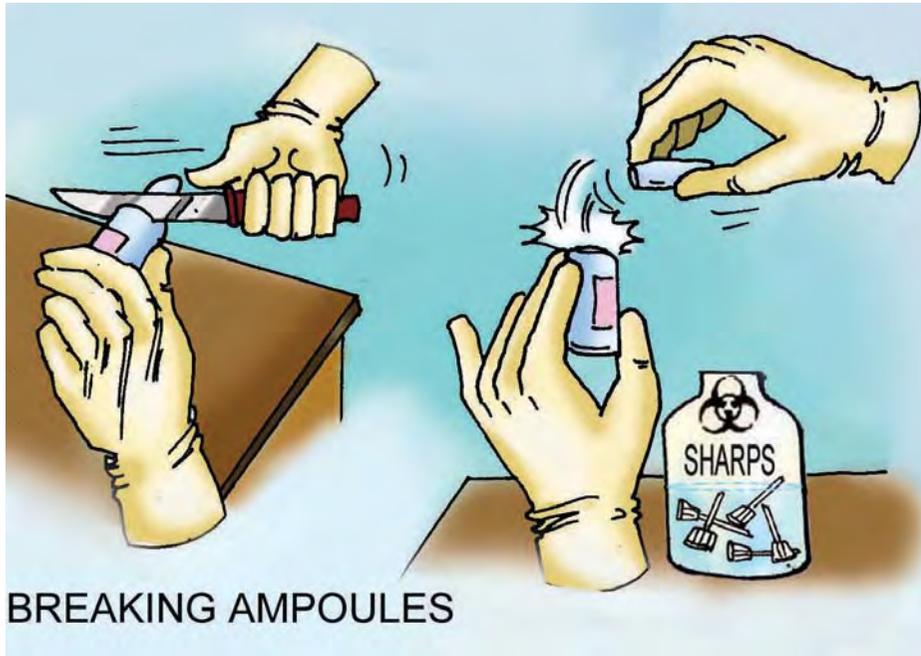
1. Always safely cut and discard the ampoules and vials in puncture proof container
2. Finally dispose the broken glasses in sharps pit located in PHC

Don'ts

1. Never cut the ampoules in such a way that they can hurt others
2. Never break glass sharps manually



Broken Glasses



2.1.4 Metal Sharps

Do's

1. Discard the metal sharps like blades, lancets and scalples in puncture proof containers
2. Disinfect the metal sharps with disinfectant solution before final disposal into sharps pit in the PHC

Don'ts

Never discard the metal sharps in non-puncture proof containers

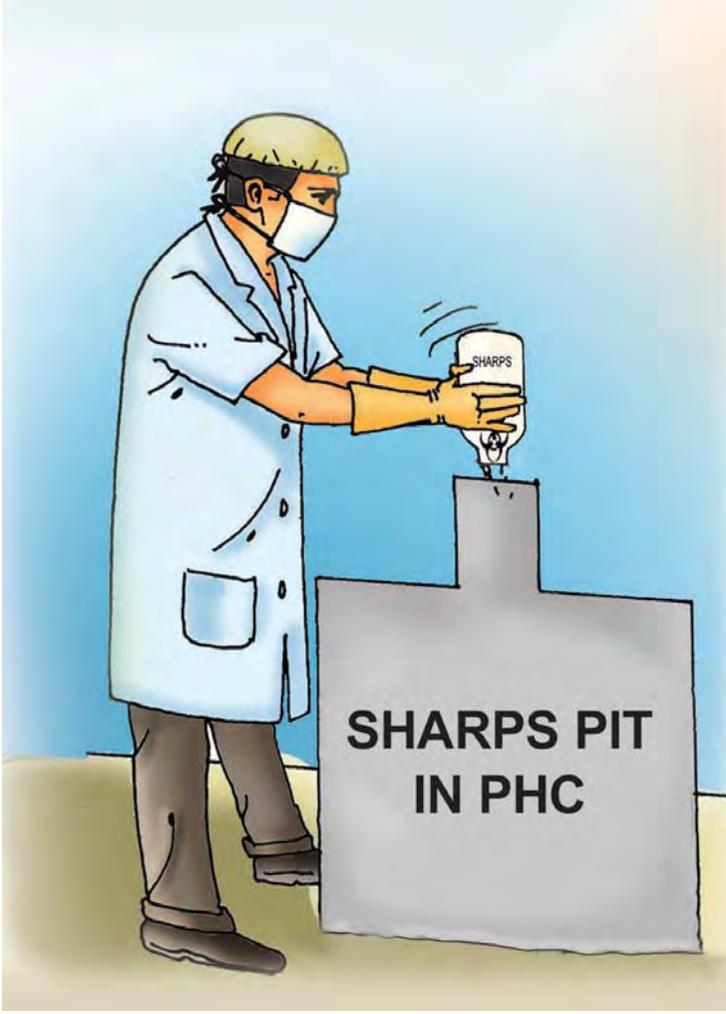


Nonsecure disposal of sharps



Never collect sharps in plastic bags

Metal Sharps



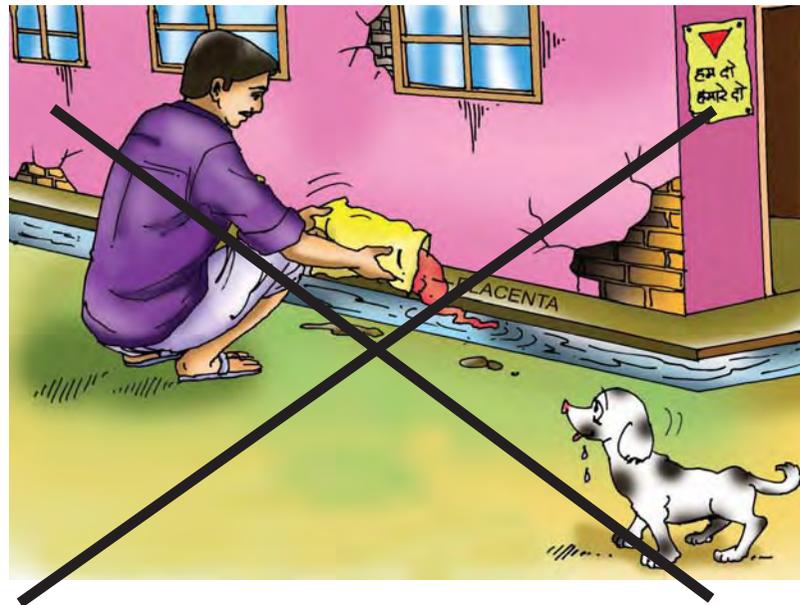
2.2 Anatomical Waste

Do's

1. Always segregate infectious waste and anatomical parts like placenta from other waste streams at the source of generation
2. Collect placenta in closed bags/covered bins at the source of generation
3. Carry the placenta in covered bins/bags to final disposal site
4. Dispose the placenta along with disinfectant in secure deep burial pit

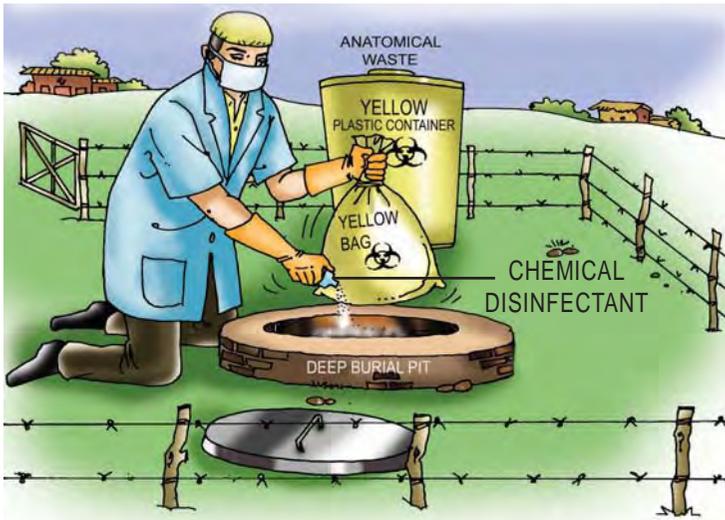
Don'ts

1. Never mix the waste at source of generation or later during collection and transportation
2. Never dispose the anatomical waste in un-secure open areas or in water bodies



Never dispose anatomical waste in open

Anatomical Waste



2.3 Plastic Waste

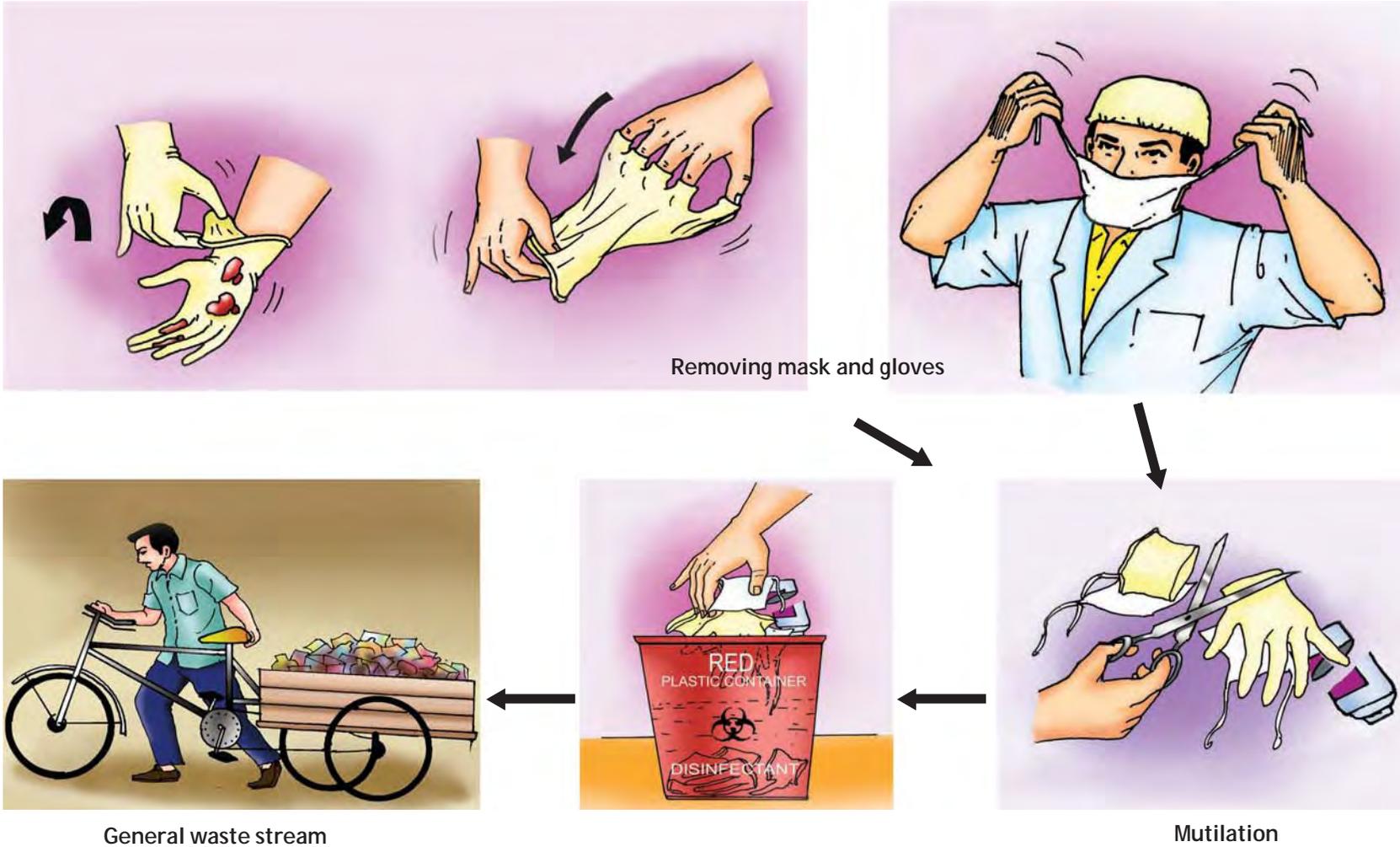
Do's

1. Always cut/puncture the plastic waste such as intra-venous tubes, bottles, syringes, latex gloves and mask by scissors before disinfection
2. Disinfect the plastics in covered containers with 1% bleaching powder solution at least for one hour
3. Dispose the disinfected and mutilated plastics in municipal dumps or send for recycling

Don'ts

1. Never dispose the used plastics without any pretreatment like disinfection and mutilation for final disposal
2. Never reuse the disposable gloves and masks

Plastic Waste



2.4 Liquid Waste

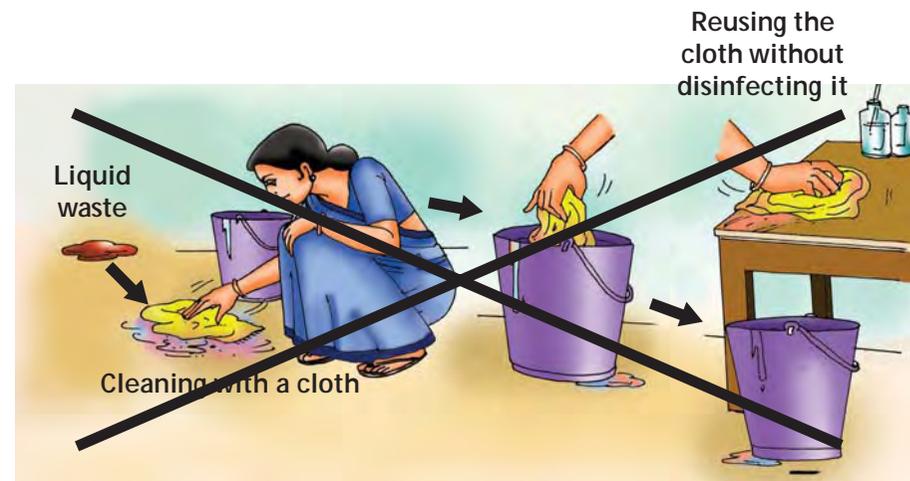
Liquid waste is any blood, body fluid, pus, any discharge from wounds or liquid chemicals.

Do's

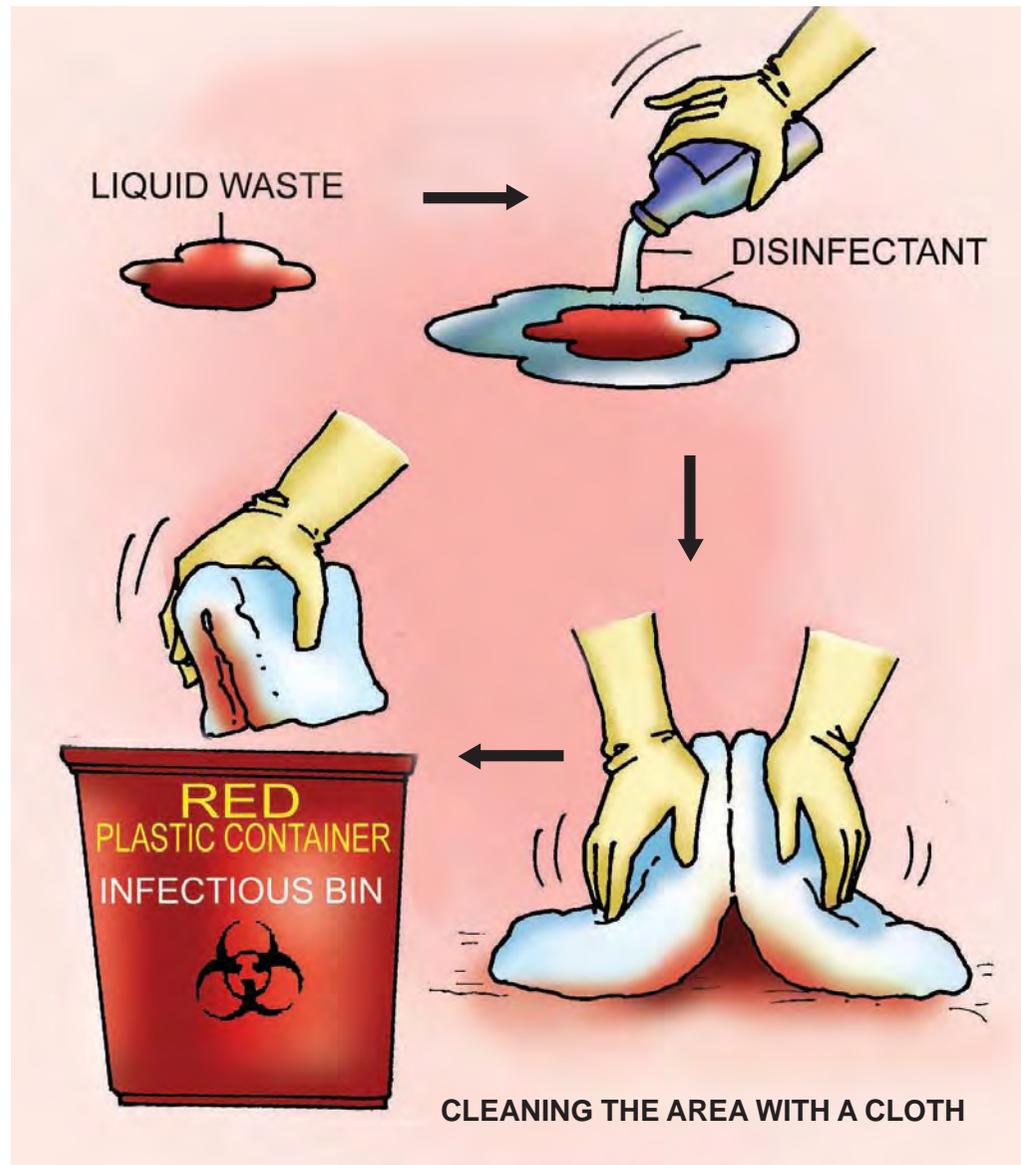
1. Clean the liquid waste spill by adding equal or more quantity of bleaching powder solution and leave the area for 30 minutes
2. Wipe the area with a swab/ cloth
3. Discard the swab/ cloth after cleaning the area into red bin meant for plastics and other waste
4. If possible dispose the liquid waste of the drains

Don'ts

1. Never clean liquid waste spills without adding disinfectant to the spills
2. Never reuse the cloth used for cleaning the spills for any other purpose without proper disinfection. Infection control



Liquid Waste



INFECTION CONTROL

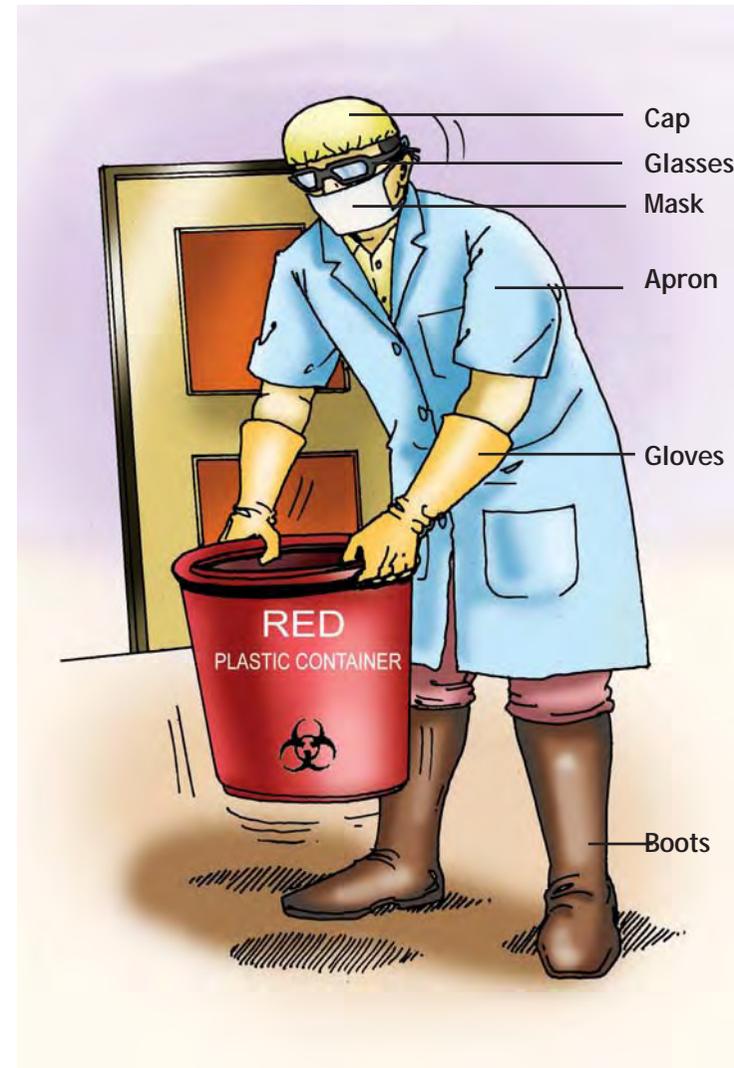
1. Hand Washing

1. Hand washing is one of the most important infection control precaution to be followed by all health care workers.
2. Always wash your hands before and after any procedure, examining two patients, handling waste, eating and drinking, collecting lab samples and handling blood and body fluids.
3. Routine hand washing can be done by using soap and water.



2. Personal Protective Equipments

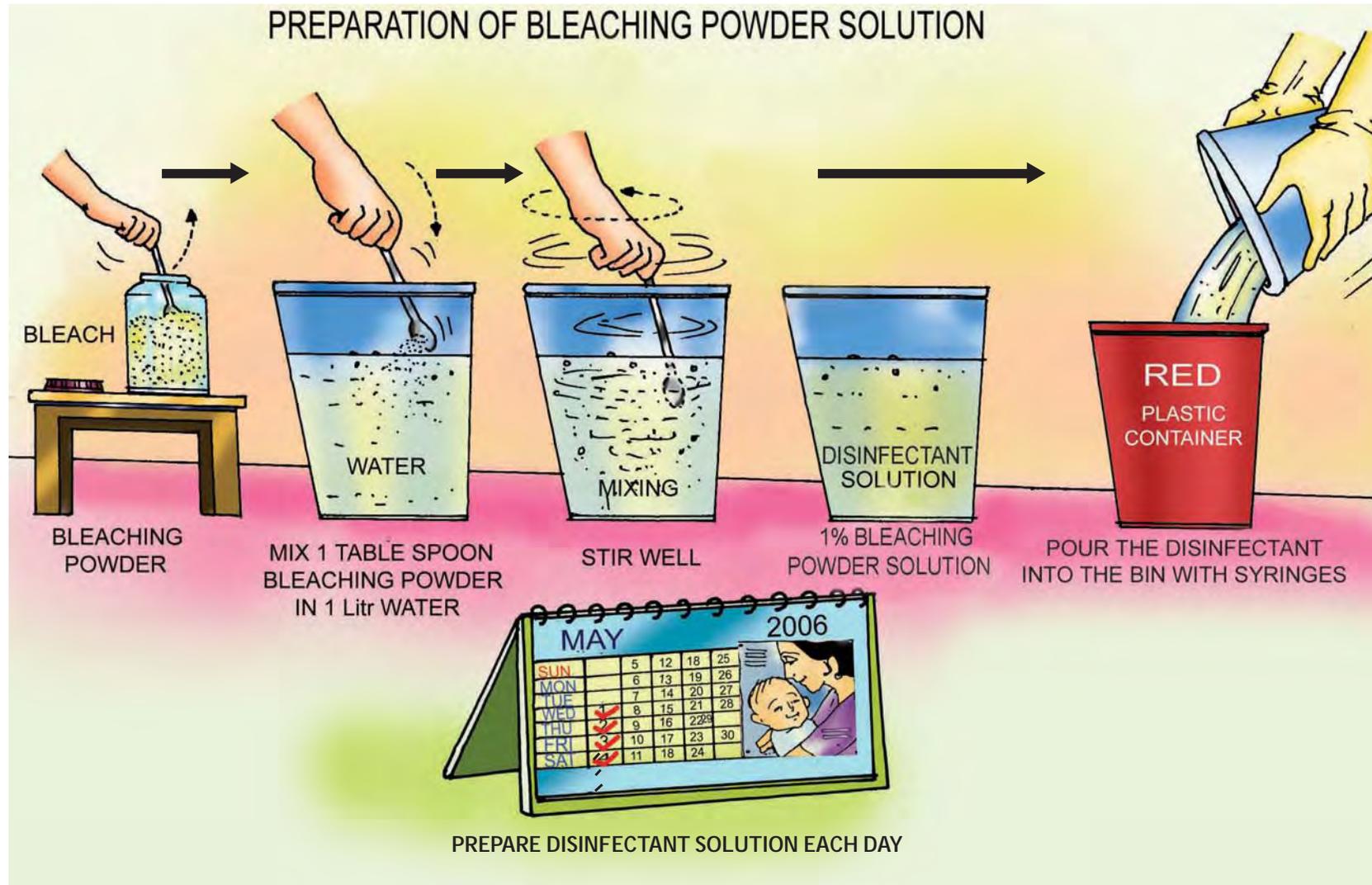
1. Always wear personal protective gears while handling waste
2. Wearing head gears, eye covers(glasses), mask, apron , gloves and boots these constitute the barrier for transmission of infections
3. Taking immunization against Hepatitis B and Tetanus are important universal precautions



3. Use of Disinfectants

1. Store bleaching powder in dry, dark and cool places
2. The bleaching powder container should always be kept closed
3. While preparing 1% bleaching powder solution add 1 table spoon of bleaching powder in 1 litre water
4. Stir the solution well
5. After the solution is ready, pour the solution in the waste bin meant for disinfection of used plastics and sharps
6. Always remember to prepare new bleaching powder solution every day. Only use freshly prepared bleaching powder solution each day

Use of Disinfectants

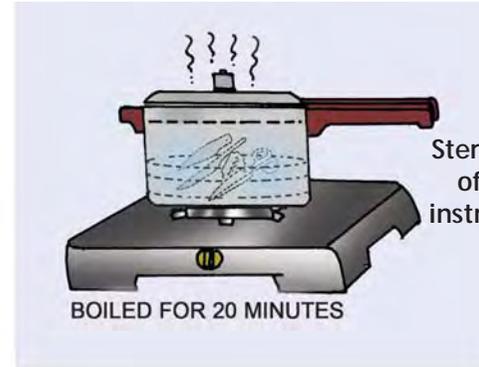
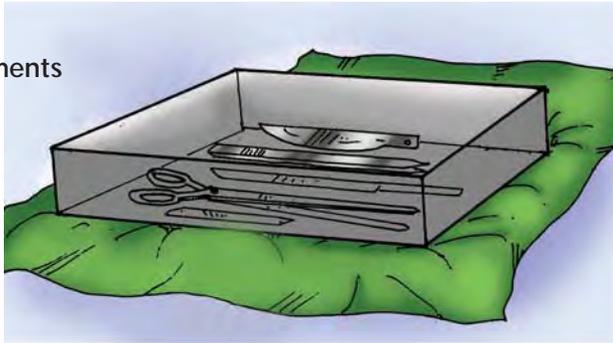


4. Sterilization of Reusable Equipments

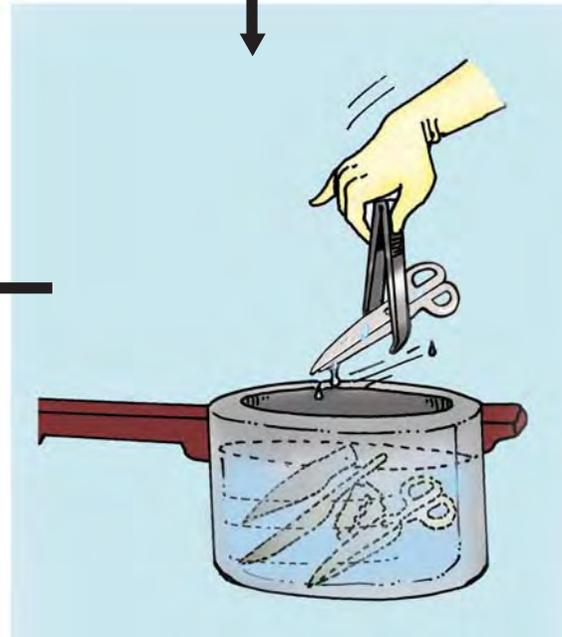
1. Always sterilize reusable instruments before reusing them
2. Wash and clean the instruments before sending them for sterilization/boiling for 20 minutes
3. After the instruments are sterilized handle them with sterile gloves
4. Store the sterile instruments in special areas meant for storing them

Sterilization of Reusable Equipments

Used instruments



Sterilization of used instruments



5. Cleaning Floors

1. Wear Personal protective gears like gloves and apron while cleaning the floors
2. Clean the floors regularly
3. Use hot water and soap for routine cleaning of the floors
4. Add disinfectants to water for cleaning labour room
5. Mop/ cloth needs to be disinfected after every use



C. ANNEXURE

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

| Option | Waste Category | Treatment & Disposal |
|----------------|---|--|
| Category No. 1 | Human Anatomical Waste (human tissues, organs, body parts) | incineration@/deep burial* |
| Category No. 2 | Animal Waste (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 | Microbiology & Biotechnology Waste (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 | Waste sharps (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 ## |

| 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.

Mutilation/shredding must be such so as to prevent unauthorised reuse.

@ There will be no chemical pretreatment before incineration. Chlorinated plastics shall not be incinerated.

* Deep burial shall be an option available only in towns with population less than five lakhs and in rural areas.

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.
3. Categories 8 and 10 (liquid) do not require containers/bags.
4. Category 3 if disinfected locally need not be put in containers/bags.

Standards for Deep Burial Pit

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

1. A pit or trench should be dug about 2 meters deep. It should be half filled with waste, then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.
2. It must be ensured that animals do not have any access to burial sites. Covers of galvanised iron/wire meshes may be used.
3. On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.
4. Burial must be performed under close and dedicated supervision.
5. The deep burial site should be relatively impermeable and no shallow well should be close to the site.
6. The pits should be distant from habitation, and sited so as to ensure that no contamination occurs of any surface water or ground water. The area should not be prone to flooding or erosion.
7. The location of the deep burial site will be authorised by the prescribed authority.
8. The institution shall maintain a record of all pits for deep burial.

