General Surgery - Topic 15 - Biohazard disposal

Biomedical Waste and Biohazard Disposal

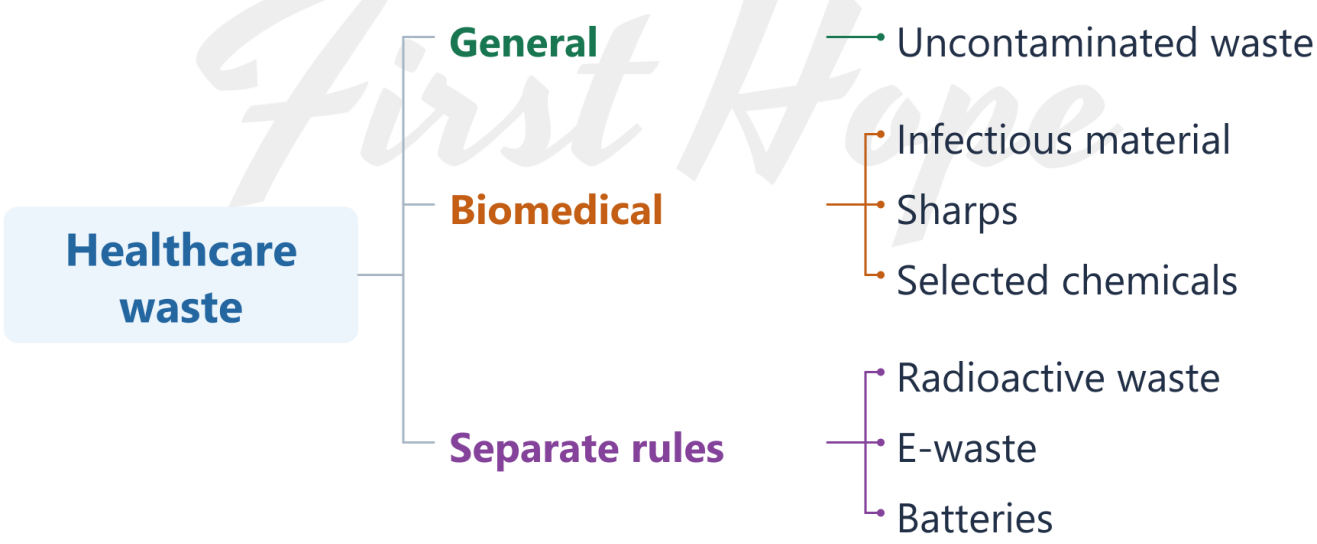
Biomedical Waste

- Biomedical waste is produced during diagnosis, treatment, immunization and related healthcare activities.

Why Segregation Matters

- Incorrect handling can cause needlestick injuries, infection, toxic exposure and environmental pollution.
- Mixing ordinary waste with infectious waste increases the amount requiring special treatment.
- The person generating waste should place it in the correct container immediately at the point of use.
- India uses the Biomedical Waste Management Rules and their amendments, with local implementation through the authorized facility and pollution-control authorities.

Broad Waste Groups



1. **General Nonhazardous Waste**
   - General non-hazardous waste includes uncontaminated packaging and ordinary food waste and follows the applicable municipal segregation system.
2. **Biomedical Waste**
   - Biomedical waste includes infectious material, contaminated recyclable items, sharps and selected pharmaceutical or chemical waste.
3. **Other Regulated Waste**
   - Radioactive material, electronic waste, batteries and some other hazardous waste require their own regulated streams.

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Limits of the Four-Colour System

- The four biomedical colours do not replace these separate rules.

Four Biomedical Waste Categories



Examples of the four Indian biomedical waste categories; special subgroups follow their prescribed treatment pathways

1. Yellow Category

Waste Included

- Yellow containers receive specified waste such as human anatomical waste, soiled dressings and blood bags.
- Expired or discarded medicines, cytotoxic materials, certain chemical waste and laboratory waste have specific yellow-category subgroups and handling requirements.
- The waste category is determined by the material and hazard, rather than by the colour of an ordinary household bin.

Special Handling Requirements

- Laboratory cultures and other designated highly infectious material need the prescribed on-site pretreatment before collection for final disposal.
- Not every yellow-category item is treated in the same way, so the waste subtype must be identified.

2. Red Category

Recyclable Contaminated Plastics

- Red containers receive contaminated recyclable plastics such as intravenous tubing, catheters, urine bags and appropriate plastic gloves.
- A syringe without its needle belongs to the appropriate recyclable-plastic stream when it meets the category definition.
- Segregation must follow the local approved device-disposal system so that the needle is not removed by an unsafe manual action.

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Authorised Processing

- These items undergo authorized disinfection or sterilization and shredding or mutilation before permitted recycling.
- Untreated contaminated plastic must not enter ordinary recycling.

3. White Translucent Category

Sharps Containment and Direct Disposal

- A puncture-proof, leak-proof and tamper-proof white translucent container receives metal sharps such as needles and scalpel blades.
- Discard the sharp directly into the container without hand sorting or unsafe recapping.
- Follow the designated system for syringes with fixed needles rather than attempting unsafe manual separation.

Authorised Treatment and Destruction

- Authorized treatment and destruction prevent reuse and further puncture injuries.

4. Blue Category

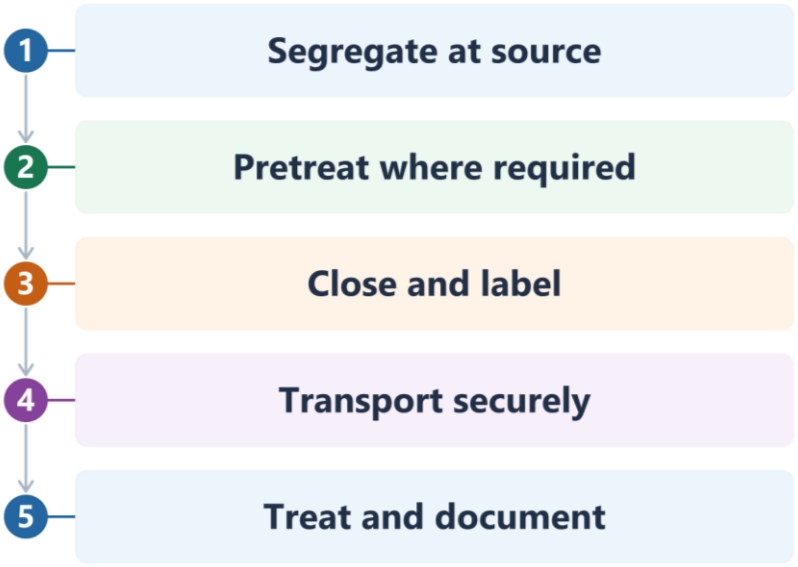
- Blue-marked containers receive specified contaminated glassware, including suitable medicine vials and ampoules, and metallic body implants.
- Glass containers contaminated with cytotoxic drugs follow the cytotoxic-waste pathway and are not ordinary blue-category glassware.
- Use a rigid, puncture-resistant and leak-resistant container where breakage creates an injury risk.
- Authorized disinfection or sterilization is followed by the permitted recycling pathway.

Examples of Waste Segregation

Item	Usual biomedical category
A blood-soiled dressing	Yellow.
A used plastic catheter	Red.
A used metal needle	White translucent.
An ordinary contaminated glass medicine vial	Blue, unless a special hazard changes its route.
A cytotoxic-drug vial	The prescribed cytotoxic-waste pathway.
Clean paper packaging	The applicable general-waste stream.

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Collection, Transport and Treatment



Safe Collection

Point-of-Use Containers and Labelling

- Place correctly labelled containers close enough to the procedure that staff do not carry exposed sharps across the room.
- Use the specified non-chlorinated bags and containers and apply the required biohazard, cytotoxic and barcode identification.

Closure and Safe Handling

- Close containers before they reach the marked fill limit and never compress their contents by hand.
- Do not reopen a bag to recover or manually re-sort contaminated items.
- Keep anatomical specimens intended for diagnosis separate from waste until their clinical and laboratory requirements are complete.

Storage and Transport

Secure Movement and Storage

- Move waste in closed, designated, cleanable trolleys along the approved route.
- Keep temporary storage secure and inaccessible to patients, animals and unauthorized people.

Collection Deadlines and Records

- Arrange prompt collection and observe the statutory 48-hour storage restriction for the specified untreated anatomical, animal, soiled and biotechnology waste streams, together with the facility's other storage limits.
- If an exceptional delay is unavoidable, follow the prescribed authority-notification and protective-measure requirements rather than silently leaving waste in the ward.

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