# Community Health Nursing II — Unit 12: Bio-Medical Waste Management

## Biomedical Waste

### Definition

- **Biomedical waste** is waste generated during diagnosis, treatment or immunisation of humans or animals, related research or production and testing of biological materials within the applicable rules.
- It includes materials that may be infectious, sharp, chemically hazardous or otherwise require special handling.
- Ordinary food waste, clean paper and uncontaminated packaging are general waste and should not be mixed with biomedical waste.

### Importance of Safe Management

- Incorrect handling can cause needlestick injuries, infection, chemical exposure and contamination of air, soil and water.
- Mixed waste increases the amount requiring special treatment and raises costs and occupational risks.
- Safe segregation protects patients, staff, waste handlers, municipal workers and the surrounding community.
- Waste management begins where the waste is generated rather than at the final treatment facility.

### Sources

- Hospitals, clinics, laboratories, blood banks, vaccination sessions and health camps generate biomedical waste.
- Home-based healthcare and community procedures also produce sharps, dressings and other clinical waste requiring an approved collection route.
- The healthcare provider must plan disposal before beginning an outreach or home-care procedure.

## Regulatory Framework

### Biomedical Waste Management Rules

- India's **Biomedical Waste Management Rules, 2016**, with subsequent amendments including those in 2018 and 2019, provide the main framework for regulated biomedical waste handling.
- The framework uses four principal colour categories: yellow, red, white translucent and blue.

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- Requirements include segregation, safe storage and transport, authorised treatment, worker protection and records.
- Follow the current applicable rules, pollution-control authority conditions and facility procedures rather than using an outdated colour chart.

## Important Amendments

### 1. Chlorinated Materials

- The 2018 amendment set a phase-out deadline of **27 March 2019** for chlorinated plastic bags and gloves, with blood bags exempted from that phase-out.
- The **2019 clarification** also excludes urine bags, effluent bags, abdominal bags and chest drainage bags from the term chlorinated plastic bags in this requirement.
- These exceptions concern the specified clinical bags and do not permit chlorinated bags for collecting, storing or transporting biomedical waste.
- Use the current authorised non-chlorinated waste bags and follow item-specific requirements rather than assuming all medical plastics have the same restriction.

### 2. Traceability and Reporting

- Common treatment operators were required to establish barcoding and vehicle tracking under the pollution-control guidelines.
- The amendment also strengthened online availability of annual reports and the reporting of district-level waste information.

### 3. Pretreatment at the Healthcare Facility

- Specified laboratory and microbiological waste, blood samples and blood bags require approved on-site disinfection or sterilisation before transfer for final disposal.
- Sending untreated material to a common facility does not replace this required pretreatment.

## Responsibilities

### 1. Healthcare Facility or Occupier

- The responsible facility authority must arrange safe segregation, collection, storage, treatment and disposal through an authorised system.
- It must provide suitable containers, training, protective equipment, immunisation and incident management for workers.
- Records, required reports and authorisation conditions must be maintained and reviewed.

### 2. Waste Treatment Operator

- An authorised common treatment facility collects and treats waste according to the permitted process and capacity.
- Treatment, transport and disposal records support traceability and compliance.

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- Healthcare facilities remain responsible for correct segregation before collection.

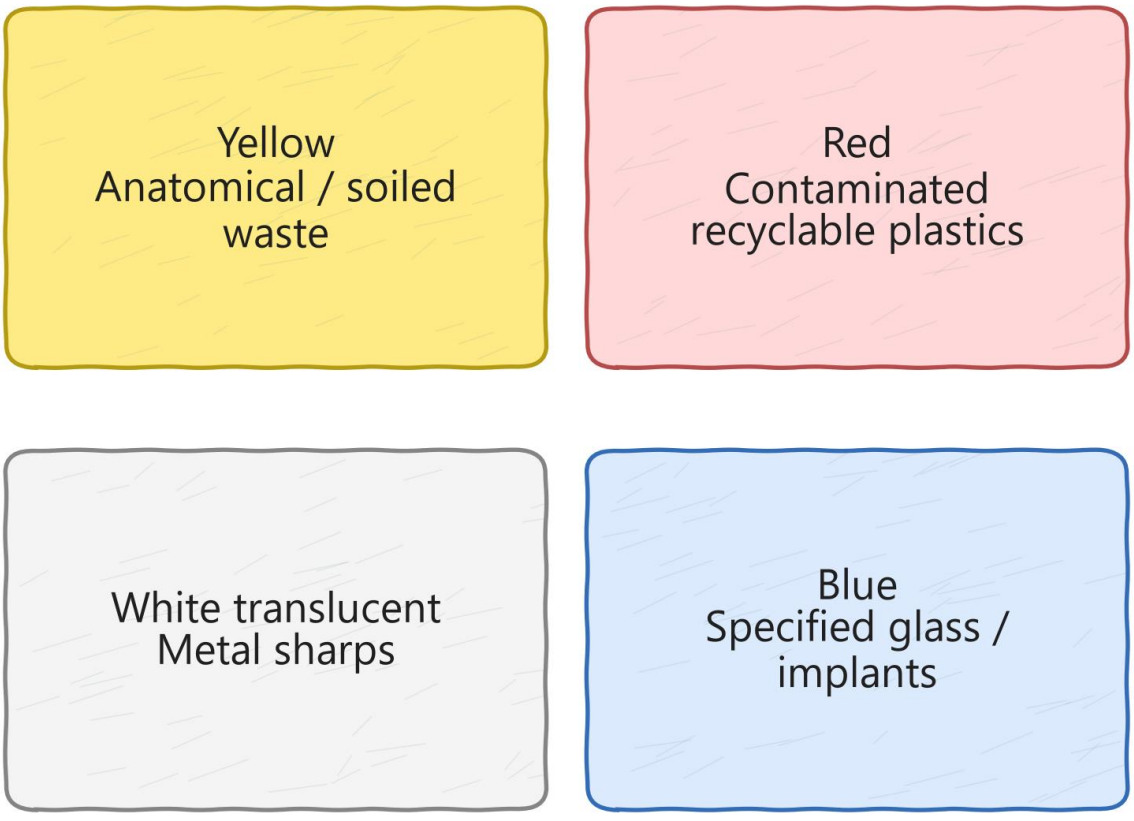
### 3. Healthcare and Waste-handling Staff

- Staff place each item in the correct container at the point of generation and avoid unsafe handling.
- They report spills, injuries, missing containers and other failures promptly.
- Cleaning or waste-handling staff should not be expected to sort mixed infectious waste by hand.

## Waste Segregation

### Definition

- **Segregation** is separation of waste into the correct category immediately where it is produced.
- Correct segregation allows each waste stream to receive the appropriate treatment and prevents avoidable exposure.
- Once general waste is contaminated by mixing, it cannot simply be recovered by unprotected manual sorting.




*Biomedical waste segregation*

### General Principles

- Place labelled containers close to the procedure area before starting care.
- Use the colour, material and strength required for the waste category.

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- Keep general waste, biomedical waste and separately regulated hazardous waste distinct.
- Close containers at the marked fill limit and do not compress waste by hand.
- Keep lids and supports usable and replace leaking or damaged containers safely.

## Colour Categories

### 1. Yellow Category

#### Main Contents

- Yellow includes human or animal anatomical waste, soiled materials such as blood-contaminated dressings and specified laboratory waste.
- Expired or discarded medicines and relevant pharmaceutical or chemical waste follow the designated yellow-category route under the rules.
- Cytotoxic medicines and items contaminated with them require their specifically authorised handling and treatment pathway.

#### Handling and Treatment

- Use the prescribed non-chlorinated bag or appropriate container for the particular waste type.
- Treatment varies by the subcategory and may involve authorised incineration, other specified treatment or return to the supplier.
- Laboratory and highly infectious waste requiring pretreatment must receive it through the approved process before transfer.
- Do not assume that every yellow-category item can be placed in one ordinary bag or treated by the same method.

### 2. Red Category

#### Main Contents

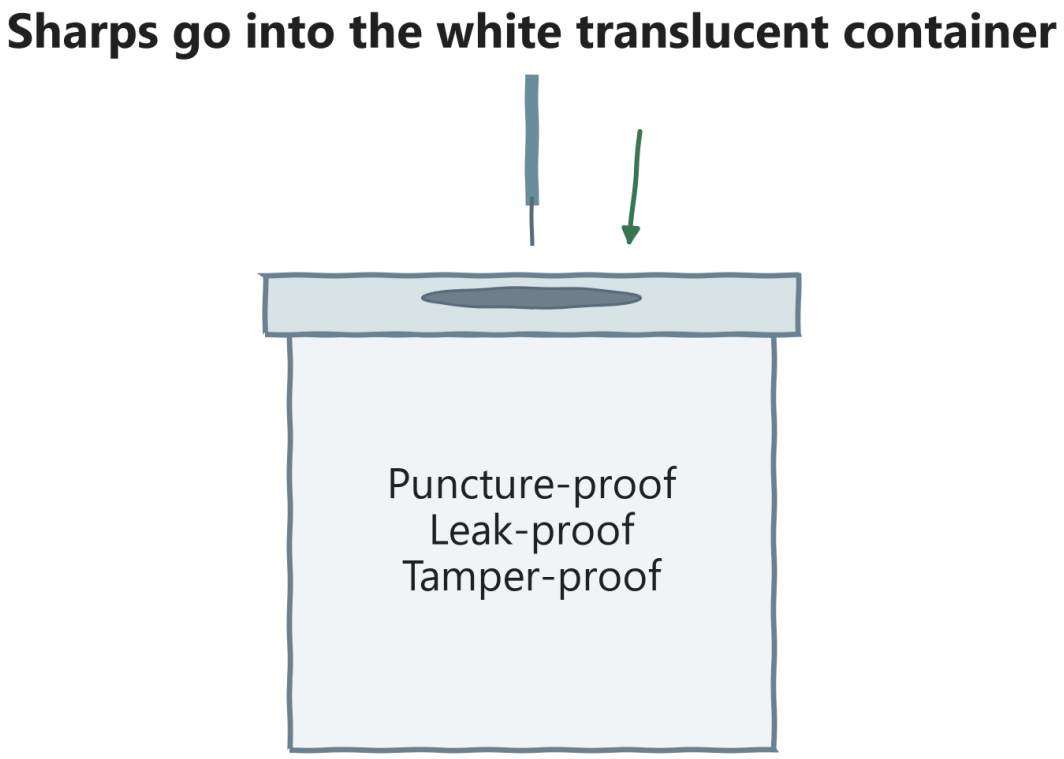
- Red is used for contaminated recyclable items such as suitable plastic tubing, intravenous sets, catheters, urine bags and gloves.
- Syringes without needles belong in this stream when they meet the prescribed category and have been safely separated using an approved method.

#### Handling and Treatment

- Use the prescribed red bag or container and avoid mixing sharps or anatomical waste into it.
- Authorised treatment disinfects or sterilises the waste, followed by shredding or mutilation and permitted recycling as required.
- Contaminated plastic must not be sold or reused without the required treatment and authorised process.

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## 3. White Translucent Category




***Safe sharps containment***

### Main Contents

- White translucent puncture-resistant containers are used for sharps including needles, scalpel blades and other contaminated metal sharps.
- Syringes with fixed needles are handled through the prescribed sharps route.

### Handling and Treatment

- The container must be puncture-proof, leak-proof and tamper-proof as required.
- Discard sharps immediately after use without recapping, bending or manually breaking them.
- Close the container at its fill line and send it for the authorised sterilisation and subsequent destruction, encapsulation or metal-recovery process as applicable.

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