

Title Slide-1: Environmental Disinfection, BMW and Dead Body Disposal

in Context of COVID 19

As the present COVID 19 pandemic continues to pose a challenge, there is a need to undertake all possible interventions of infections prevention and control diligently. Environmental disinfection is one such important measure.

BMW management also constitutes an aspect of environment safety so that all infectious waste can be disposed and treated safely to prevent transmission to other persons as well as taking environmental pollution into consideration.

To complete the subject we also will talk of dead body disposal and disinfection , as it is different for COVID-19.

Slide 2: Role of Environment

As the person suffering from the disease coughs or sneezes or talks loudly aerosols of different sizes are generated and settle down in the surrounding surfaces depending on the size. In many earlier studies on respiratory infection models , a cut off of 5μ size of droplets has been shown to be a factor determining whether the infection transmission will be via contact or airborne, which has implication in deciding the control measures. So as is evident, when the aerosols of size more than 5μ are generated, the respiratory droplets fall on surfaces around. In such situations environmental disinfection is important intervention in the prevention and control of transmission.

Slide 3: Environmental Contamination

Virus can remain on the surfaces for a certain length of time depending on various factors like the nature of surface and other conditions like temperature and humidity, as has been observed with other respiratory viruses. Transmission can then occur via contact with hands. When a person touches the contaminated surfaces, especially the high touch surfaces, and then touches the face or eyes, transmission of infection occurs. Therefore use of an effective disinfectant at frequent interval is needed to prevent such occurrence.

Important point to remember is that cleaning with detergent is essential before disinfection. Organic matter reduces the efficacy of disinfectant. Another important point regarding the optimal action of a disinfectant is the concentration and contact time of disinfectant.

Slide 4: Steps of Disinfection: While Patient is Admitted

- Cordon off contaminated area, wear appropriate PPE and mop the floor with detergent and water
- Then proceed to disinfection using 1% Sodium Hypochlorite on the floor and all surfaces
 - Freshly prepared for each use

- Contact time of at least 10 minutes
- 70% Alcohol: for delicate instruments (thermometer, stethoscopes, BP cuff etc.) or metallic surfaces

Mop the surfaces with disinfectants using damp cloth and avoid spraying and leaving the disinfectant.

Slide 5: Steps of Disinfection: After Patient Discharge

- After shifting of COVID positive patient to designated area and COVID negative patients are shifted out, the empty cubicle should undergo terminal disinfection.
- Perform 2-step cleaning (Detergent + 1% Sodium Hypochlorite)
- Fogging with H₂O₂ may be carried out to **reach all crevices and corners** of the room as per Institutional policy.

Slide 6: Recommended frequency of disinfection

S. No.	Patient area	Frequency
1	Screening/triage area	At least twice daily
2	Inpatient rooms	At least twice daily, preferably three times daily, in particular for high-touch surfaces
3	Inpatient rooms – unoccupied (terminal cleaning)	Upon discharge/transfer
4	Outpatient / ambulatory care rooms	After each patient visit (in particular for high-touch surfaces) and at least once daily terminal clean
5	Hallways / corridors	At least twice daily
6	Patient bathrooms/ toilets	Private patient room toilet: at least twice daily Shared toilets: at least three times daily

Slide 7: Implementation and monitoring of disinfection

- Monitoring is most important component
- SOPs must be defined
- Work instructions displayed in bold
- Clear delineation of responsibilities
- Senior supervisory staff should check preparation technique
- Measuring devices must be provided for measuring exact volumes of disinfectionsreagents .
- Have checklists to ensure frequency .
- Especially the toilet areas need attention.

- Supply of hand rubs and soaps should be ensured in adequate amount.
- Training of staff to prepare disinfectants, appropriate PPE use and hand hygiene.

Slide 8: Biomedical Waste Management in context of COVID 19

Slide 9: Biomedical Waste Management

Legal framework

- Constitution of India-Article 21 - includes the fundamental right to clean environment with health & medical care
- Biomedical waste (management & handling) rules '98 under environment protection act 1986 w.e.f. 20th July 1998

Slide 10: Bio-Medical Waste Management Rules, 2016

- apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste . e.g hospitals, nursing homes, clinics, dispensaries, pathological laboratories, blood banks, health camps, forensic laboratories ,research labs etc.
- Subsequently came under Central Pollution Control Board, Ministry of Environment, Forest & Climate Change.

Slide 11: Key Points for BMW

- Proper segregation is the “core” principle
- Collection & transportation is a vital link between generation & treatment of waste
- Common biomedical waste treatment facilities are authorized (CBWTF)
- Staff trained in infection control

Slide 12: The slide shows the color coded segregation of waste to be done at point of generations.

Slide 13: Treatment of Waste

S. No.	Color code	Final disposal
	Yellow (non chlorinated bags)	Incineration
	Red bags	Autoclave/ microwave, shredding, recycling
	Blue bags	Shredding , recycling
	White container	Autoclave, shredding, recycling

- Liquid waste management is through ETP and STP plants
- Microbiology laboratory waste and blood bags to be pre treated onsite

Slide 14: In context of Covid 19-BMW

As the epidemic spreads the number of hospital beds are not able to meet the requirement. Only the moderate to severe cases could be hospitalized but a large percentage 80-85% of mild cases needed to be in COVID care facilities outside hospital or in quarantine facilities or home isolation/quarantine. There are many areas outside hospital where the waste is generated. There was a need to address this along with a mechanism to dispose off food, PPE etc from such Covid areas which were otherwise did not come under the organization having licenses for biomedical waste generation and disposal.

In context of COVID 19 following areas need alteration.

- COVID-19 Isolation wards
- Sample Collection Centres and Laboratories
- Quarantine Camps/Homes or Home-Care facilities
- CBWTF- Common BMW treatment facilities
- ULB- urban local body

Management of wastewater from HCFs / Isolation Wards

Slide 15: Revisions of Guidelines in Context of COVID 19

- Hospitals
 - Waste segregation and handling
 - Disposal of PPE
- Quarantine and homecare facilities
- Household (general waste) vs Biomedical waste
- Sample collection units in community
- CBWTF /ULB
- STP/ETP monitoring
- Disinfection of all the bags, trolleys etc. from outside

Minimize yellow bag waste and modifications in solid waste management guidelines

Slide 16: COVID 19 waste : specific treatment

- **Double-layered bags** (using 2 bags)- adequate strength and prevent leakage.
- **Dedicated collection bin** labelled as “COVID-19” - in separate temporary storage room.

- **Bags/bins/trolleys labelled “COVID-19 Waste”** for transporting waste from ward to disposal site.

Slide 17: Transport to CBWTF

- Record keeping
- Ensure proper disinfection of trolleys and bags exterior with 1% hypochlorite
- Adequate PPE to staff

Treatment and disposal immediately on receiving

Slide 18: COVID-19: Dead Body Management

- Packaging
- Disinfection
- Disposal

Slide 19: Every case needs to be treated as Covid 19 case- Poster shows the steps

1. General instructions

- A. No direct contact with blood or body fluids from the dead body.
- B. Put on personal protective equipment (PPE) including heavy duty gloves, water resistant gown/plastic apron, and N-95 mask. Use goggles or face shield to protect eyes.
- C. All tubes, drains and catheters on the dead body should be removed.
- D. All wounds, cuts and abrasions, should be disinfected with 1% Sodium hypochlorite and covered with waterproof bandages or dressings.
- E. All Orifices (Nostrils, Mouth and Anus) needs to be plugged.

Tie/Put Hands folded on abdomen/Chest and Legs at ankle using Cotton bandage

2. Steps

Place the unzipped Body Bag duly expanded on the stretcher.
Note:- If Body bag is having Central Zip then body bag is to be used in Last Step before shifting the Body out.

- 2 Place white shroud/sheet duly expanded on stretcher.
- 3 Put thick polythene sheet over this white sheet.
- 4 Pull Body from bed to stretcher using corners of bed sheet on this plastic sheet.
- 5 Wrapping of polythene sheet over the body by raising both sides up bringing them at centre and folding downward centrally in such a way that entire body is wrapped and prevents spillage of any fluid.
Flap on lower (Feet side) folded up towards lower leg and of upper (Head Side) down towards Face/Neck.
Tie the sheet at three ends- Head Side, Leg Side and Middle of Trunk
- 6 Now wrap white sheet.
Loose ends of sheet at both upper (Head side) and lower ends (feet side) are folded over Face/Neck and lower leg region.
Use Bandage to tighten at the level of chest-abdominal wall junction.
Tie sheet at head (Vertex) end and Feet end using bandage.
- 7 Label the body. (Name, Age, Sex, TC Number, Date of admission, COVID Status, Date of Death etc.)

8 Place the body in leak proof zipped plastic body bag and shift outside the ICU (Please also see Step 1) .

9 Spray 1% Hypochlorite solution over the exterior of the body bag.

Slide 20: Environmental cleaning and BMW

- Disposal of all waste as per BMW guidelines
- Used linen should be handled as little as possible Laundry bag should be securely tied up. Staff should follow their hospital guidelines on handling of soiled linen.
- Used equipment should be autoclaved or decontaminated with disinfectant solutions in accordance with established disinfectant policy.
- All surfaces which may be contaminated should be wiped 1% sodium hypochlorite and leave it for 15-30 . Metal surfaces could be wiped with 70% alcohol.

Slide 21: Disposal of dead body

- Viewing in funeral parlor and hygienic preparation are allowed.
- Embalming is NOT allowed.
- Cremation is advisable.

Slide 22: References

- Cleaning and disinfection of environmental surfaces in the context of COVID-19 ,Interim guidance, World health organization, 15 May 2020,
- Guidelines for Handling, Treatment and Disposal of Waste Generated during, Treatment/Diagnosis/ Quarantine of COVID-19 Patients, Central Pollution Control Board,(Ministry of Environment, Forest & Climate Change), Rev 4, July 2020
- Ministry of health & family welfare directorate general of health services (EMR division). COVID-19: Guidelines on dead body management, March 2020

Slide 23- Thank you