

SJH Policy on Bio-medical waste management for BMW from patients in novel Corona Virus Ward/OPD

As per BMWM (Principal) rules 2016 and BMWM (Amendment) rules 2018, 2019, National IPC guidelines 2020, CDC and WHO IPC update Jan 2020

Biomedical waste categories and their segregation, collection, treatment, processing and disposal options in Safdarjung Hospital and VMMC. Only pretreatment and segregation will be done in the hospital and the final disposal will be done by common biomedical waste treatment and disposal facility (CBMWTF). Biomedical waste devices, articles generated during diagnosis, treatment, management, immunization etc from patients with nCoV and HCW working in such ward/opd should be managed in accordance with safe routine procedures and rules.¹⁻⁷

Yellow Category

(a) Human Anatomical Waste:

Human tissues, biopsy: Yellow coloured non-chlorinated plastic bags.

(b) Animal anatomical waste: Not applicable in nCorona virus ward/OPD (only in nCoV research labs)

(b) Soiled Waste:

Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components are disposed off in yellow bag.

(d) Cytotoxic drug vials shall not be handed over to unauthorised person under any circumstances. Expired cytotoxic drugs to be returned back to the manufacturer or supplier for incineration at temperature >1200°C. Leftover cytotoxic drugs and items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc to common biomedical waste treatment facility for incineration at >1200 °C in yellow bag or container with cytotoxic label.

(e) Chemical Waste:

Chemicals used in production of biological and used or discarded solid disinfectants, residual or discarded chemical solid waste and chemical sludge are discarded in yellow coloured non-chlorinated plastic bags or containers and disposed of by incineration by CBMWTF.

(f) Liquid waste generated due to use of chemicals in production of biologicals, used or discarded disinfectants, patients samples infected secretions, aspirated body fluids liquid from laboratory, ward, OT and disinfecting activities etc should be collected separately and made safe by disinfection by chemical treatment using **1-2% sodium hypochlorite**^{2,4} solution for a contact period of 30 min and directed to effluent treatment system or then discharged into drains/sewers. The combined discharge should conform to the discharge norms given in schedule III, as per BMWM (Principal) rules, 2016.^{1,2}

(g) Discarded items:

Linen, Mattresses, beddings contaminated with blood or body fluid Non-chlorinated (lime/alcoholic: 5 % Lysol for 30 minutes, 5% Phenol for 30 min) or 1-2% sodium hypochlorite chemical disinfection followed by shredding and customised to fit in nonchlorinated yellow bag for incineration.

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(h) Microbiology, biotechnology waste

Microbiology, biotechnology waste i.e. laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, humans and animals cell culture used in research, residual toxins culture plates dishes have to be pretreated on site by autoclaving in an autoclave safe plastic bag/container there after sent for final disposal in its respective colour category to CBMWTF. The discarded blood bags are to be counted, sealed, weighed and all the records to be made and then packed in autoclave safe plastic bags or containers to be autoclaved on site and then sent in yellow bag to CBMWTF for incineration.

Red category

Contaminated Waste (Recyclable)

(a)Wastes generated from disposable items such as tubing, drains, oxygen mask, bottles, intravenous tubes and sets (with needles cut), catheters, urine bags, and gloves are nicked, wherever applicable and put in red bag. The needles of syringes are cut with the needle destroyer/needle cutter preferably. The cut/mutilated syringe is disposed finally in red coloured non chlorinated plastic bags or containers.

Translucent (White) Category

Waste sharps including Metals:

Needles, needles from needle tip cutter or burner, scalpels, blades or any other contaminated sharp object that may cause puncture and cuts. The needles of syringes are cut with the needle destroyer/needle cutter preferably. This includes both used, discarded and contaminated metal sharps. These are stored in tamper proof, leak proof and puncture proof containers for sharps storage. Collect and send for final disposal when 3/4 full. These are sent to central common waste site in tamper proof, leak proof and puncture proof containers for final disposal to CBMWTF.

Blue category: Glass and metallic implants

The blood sample glass vials or broken or discarded and contaminated glass like slides etc, have to be disinfected (1-2% sodium hypochlorite for 30 minutes atleast) to be packed in puncture proof and leak proof boxes or containers with blue colored marking and then sent to common central waste site for final disposal to CBMWTF. The uninfected glass like medicine bottles or ampoules are noninfected and are put in puncture proof and leak proof boxes or containers with blue coloured marking. The metallic implants are pretreated in the same manner and are to be packed in separate puncture proof and leak proof boxes or containers with blue coloured marking.

Color-coded bags & Colour Category wise Treatment

Category	Type of Waste	Type of Bag or Container to be used*	Treatment and Disposal options
(1)	(2)	(3)	(4)
Yellow	(a) Human Anatomical Waste:	Yellow coloured non-chlorinated plastic bags	Incineration by CBMWTF
	(b) Animal Anatomical Waste:		
	(c) Soiled Waste: Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs		Incineration by CBMWTF
	(d) Expired or Discarded Medicines:	Yellow coloured non-	Expired cytotoxic drugs to be returned back to the manufacturer or supplier

	antibiotics, cytotoxic drugs	chlorinated plastic bags or containers with cytotoxic labels	for incineration at temperature >1200 °C. Leftover cytotoxic drugs and items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc to common biomedical waste treatment facility for incineration at >1200 °C.
	(e) Chemical Waste: solid discarded chemicals	Yellow coloured non-chlorinated plastic bags or containers	Disposed of by incineration by CBMWTF
	(f) Chemical Liquid Waste: Liquid Waste generated due to use of chemicals and used or discarded disinfectants.	Separate collection system leading to effluent treatment plant (ETP) system.	After resource recovery, the chemical liquid waste shall be pre-treated before mixing with other wastewater. The combined discharge shall conform to the discharge norms given in BMWM rules, 2016
	(g) Discarded linen: contaminated with blood or body fluid. Routine mask and gown	Non-chlorinated yellow plastic bags or suitable packing material	Non-chlorinated (alcoholic: 5% lysol, 5% phenol) chemical disinfection followed by incineration. Incineration
	(h) Microbiology, Biotechnology and other clinical laboratory waste, PVC Blood bags	Autoclave safe plastic bags or containers	Autoclave or Pre-treat to disinfect.** Treated waste to be sent to CBMWTF for incineration.
Red	Contaminated Waste(Recyclable) Plastics tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes(without needles and fixed needle syringes) and vacutainers with their	Red coloured non chlorinated plastic bags or containers	Autoclaving/Chemical disinfection. Treated waste to be sent to CBMWTF who would send such waste to registered or authorized recyclers or for energy recovery

	needles cut) and gloves		
White (Translucent)	Waste sharps	Puncture proof, Leak proof, tamper proof containers	Disinfection/Autoclaving or dry heat sterilization/ sent to CBMWTF and who will ensure final disposal to iron foundries(having consent to operate from the SPCB/PCC.
Blue	Glass: medicine glass vials or broken or discarded and contaminated glass Metal implants/metal guns etc	Puncture proof and leak proof boxes or containers with blue coloured marking Puncture proof and leak proof boxes or containers with blue colored marking	Autoclaving/Microwaving/hydroclaving by CBMWTF and then recycling. Contaminated glass slides require pretreatment (disinfection by sodium hypochlorite)

*Barcode label will have to be made available on every bag or container as per CPCB guidelines

**For disinfection of BMW articles freshly prepared 1-2% Sodium hypochlorite is recommended

***1% Sodium hypochlorite is 1:100 dilution (525-615 ppm of available chlorine)

****Hospital supply of sodium hypochlorite is 10% or 4% (please see label and manufacturers instructions)

*****All lab waste, patient's samples, blood bags, toxins, live vaccines, cultures (liq/solid), devices used to transfer cultures need pretreatment

Articles: bins, bags, trolleys

Bags: The bags used for storing and transporting biomedical waste shall be in compliance with the Bureau of Indian Standards. Till the Standards are published, the carry bags shall be as per the Plastic Waste Management Rules, 2016.

Yellow, Blue, Red and translucent bags/bins/containers are marked with Biohazard symbol, hospital logo and with barcoding to be supplied by CBMWTF.

BINS:

Containment of waste: An optimum number of easy to use, standard, uniform, covered, foot-operated bins of colors i.e, yellow, red bins of appropriate size would be placed at identified places in all clinical areas.

DISINFECTION OF BINS:

Chemical disinfection of the waste bins using hypochlorite solution (1-2%) should be done frequently at a separate washing facility in the hospital, **daily preferably**, at least once a week.

Segregation, package and then transport and storage to common waste site

All the biomedical waste is labeled as waste type, site of generation, date of generation before transportation from the generation site. Waste is stored in the areas of generation at an identified safe area, for an interim period after which it is transported to CBMWTF for final treatment and final disposal. During this period it is the responsibility of the administration, sanitation and security staff to ensure the safety and prevention of pilferage and recycling of the waste. No untreated bio-medical waste shall be kept stored beyond a period of 48 hours.

Collection is done

- Done twice daily or more frequently from wards/laboratories
- Label is filled up by staff on duty and given to waste collectors

Each patient care area has been provided with the waste receipt (log) book to record the quantity /number of yellow, blue, red, white (translucent) bags handed over to HCW. All the staff are required to duly fill in the waste book color code wise mentioning the number and size of bags handed over and sign the slip for further record and also to fill BMW register daily colour category wise.

TRANSPORTATION:

Hospital waste is transported in securely tied bags from the site of generation to central waste storage site through designated route, on dedicated, color coded, covered and leak proof wheel barrows/Trolleys. At the waste treatment premises verification of the number/size of the bags is done for each trolley by the sanitation staff for recording and quantification and barcoding before disposal. The central waste storage site is cleaned daily.

Chemical disinfection of the trolleys using hypochlorite solution is being done at the waste storage site, should be cleaned and disinfected daily.

Transportation to CBMWTF

The operator of CBMWTF shall transport the bio-medical waste from the premises of an occupier to any off-site bio-medical waste treatment facility only in the vehicles having label as per BMWM (Principal) rules, 2016.^{1,2,3,4}The vehicles used for transportation of bio-medical waste shall comply with the conditions stipulated by the SPCB in addition to the requirement contained in the Motor Vehicles Act, 1988 (59 of 1988), or the rules made there under for transportation of such infectious waste. Global positioning system has been added by the CBMWTF.

References:

- 1 Bio-Medical Waste Management (Principal) Rules, 2016. Published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-Section (i), Government of India Ministry of Environment, Forest and Climate Change. Notification; New Delhi, the 28th March, 2016.
- 2 BMW (Amendment) rules, 2018. Government of India Ministry of Environment, Forest and Climate Change. Notification; New Delhi, the 16th March, 2018.
- 3 BMW (Amendment) rules, 2019. Government of India Ministry of Environment, Forest and Climate Change. Notification; New Delhi, Feb, May 2019.
- 4 National Guidelines for Infection Prevention and Control in Healthcare Facilities. MoHFW, Jan 2020
- 5 WHO. Infection prevention and control of epidemic and pandemic prone acute respiratory infections in healthcare. WHO guidelines. WHO; 2014 (http://www.who.int/csr/bioriskreduction/infection_control/publication/en/, accessed on 31 Jan 2020).
- 6 WHO. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. Interim guidance. 25 Jan 2020
- 7 CDC. Infection Control 2019 Novel Coronavirus. Update 28 Jan, 2020

