VMMC and Safdarjung Hospital
Ministry of Health & Family Welfare
Government of India, New Delhi

सत्यमेव जयते

Proprietary Statement: This document contains information related to Biomedical Waste Management (BMWM) as per BMWM (principle) Rules, 2016, BMWM (Amendment) Rules 2018 & 2019 and Guidelines for Handling, Treatment and Disposal of Waste generated during Treatment/Diagnosis/Quarantine of COVID-19 patients, CPCB, Version4, 17 July 2020. It is provided to departmental staff only. Do not share verbally or otherwise without written consent of the Unit Incharge, BMW Unit, VMMC and Safdarjung Hospital, New Delhi.

Manual No.	**TITLE**		
BMW Unit/ Manual/ 01	**BIOMEDICAL WASTE MANAGEMENT**		
Effective Date: 20.02.2019			
Function	**Name**	**Designation**	**Signature**
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Distribution:QA/ QC cell, Workplace

Version No.	Effective Date
2.0	30 July.2020

1.0 INTRODUCTION: Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps. BMW is covered under BMWM (Principal), rules, 2016, BMWM (Amendment), rules, 2018 and 2019. Improper biomedical waste management (BMWM) is a major public health problem. Inefficient disposal of BMW can lead to infectious diseases, malignancies, fetal malformations, chronic cardio-pulmonary diseases, antimicrobial resistance, endocrinal disturbances, air, land and water pollution for generations to come. Efficient and eco-friendly methods for handling BMW are crucial.

Types of Healthcare Waste

The healthcare waste generated in hospitals falls into the following categories: Solid waste, BMW, E-waste, Battery waste, Construction and Demolition waste and radioactive waste and other hazardous waste, which are covered under their respective rules.

2.0 PURPOSE:

This Manual explains the procedure for biological waste management, generated at the work place and its disposal as mentioned in **Bio-Medical Waste Management 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, BMWM (Amendment) rules, 2018, MoEF & CC, Gazette notification , 16.03.2018 and BMWM (Amendment) rules, 2019, Guidelines for Handling, Treatment and Disposal of Waste generated during Treatment/Diagnosis/Quarantine of COVID-19 patients, CPCB, Version4, 17 July 2020. This Manual is applicable to all healthcare workers generating biomedical wastes.

3.0 POLICY &SCOPE:

3.1 Safdarjung Hospital follows **Bio-Medical Waste Management 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 and BMWM (Amendment) rules, 2018, MoEF & CC, Gazette notification , 16.03.2018 and and BMWM (Amendment) rules, 2019, MoEF & CC, Gazette notification , 19.03.2018.**

3.2 The hospital has constituted a dedicated BMW unit under Medical Superintendent and Addl MS for BMWM of VMMC and Safdarjung Hospital. The hospital has constituted a committee named "Bio-medical Waste Management Committee" under the chairmanship of the Medical Superintendent, to deal with the collection and disposal of hospital waste. The members of BMW committee include Addl MS BMW, Officer Incharge BMW Unit, Nodal officers BMW, Estate officer, CMO I/C Sanitation, Ex Engineer CPWD (Civil & Electrical), Store Incharges, Nursing Officers BMW, Off. NS other clinicians from various key departments. The committee is mandated to meet at least twice every year.The committee meets regularly to discuss and formulate policies regarding the biomedical waste management of the hospital. It has also brought out a Policy, SOP, BMWM poster and distributed it to all departments and wards of the hospital. This committee is also responsible for conducting regular training programmes for all categories of healthcare workers in the hospital, to educate them to follow the BMW rules.

3.3 Duties of Occupier (Medical Suptd, VMMC and Safdarjung Hospital) through BMW Unit

1.0 Occupier provides training to all its health care workers and others, involved in handling of bio medical waste at the time of induction and thereafter at least once every year and the details of training programmes conducted, number of personnel trained and number of personnel not undergone any training shall be provided in the annual report.

2.0 The occupier gets all its health care workers and others, involved in handling of bio-medical waste immunized for protection against diseases including Hepatitis B and Tetanus.

3.0 The occupier ensures segregation of liquid chemical waste at source and ensure pre-treatment or neutralization prior to mixing with other effluent generated from health care facilities and ensures treatment and disposal of liquid waste in accordance with the Water Act.

4.0 The occupier ensures occupational safety of all its health care workers and others involved in handling of BMW by providing appropriate and adequate personal protective equipments.

5.0 The occupier gets conducted the health check up at the time of induction and at least once in a year for all its HCWs and others involved in handling of bio-medical waste and maintain the records.

6.0 The occupier maintains and updates on day to day basis the bio-medical waste management register and displays the monthly record on its website according to the bio-medical waste generated in terms of category and colour coding as specified in rules.

7.0 The occupier reports major accidents including accidents caused by fire hazards, blasts during handling of biomedical waste and the remedial action taken and the records relevant thereto, in Form I to the prescribed authority and also along with the annual report.

8.0 The occupier makes available the annual report on its existing web-site.

9.0 The occupier informs the prescribed authority immediately in case the operator of CBWTF does not collect the BMW within the intended time.

10.0 The occupier establishes a system to review and monitor the activities related to bio-medical waste management, either through a committee to review and monitor the activities relating to bio-medical waste management within the establishment and submit the annual report. VMMC and Safdarjung Hospital has a BMWM committee to review and monitor such activities.

11.0 The occupier maintains all record for operation of autoclaving for waste, for a period of five years.

12.0 The occupier shall phase out use of non-chlorinated plastic bags by 27 March 2019, the chlorinated plastic bags shall not be used for storing and transporting of bio-medical waste.

4.0 DEFINITIONS

4.1 **Biomedical Waste:** Any waste generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals and including categories mentioned in Schedule 1 of BMWM Rules, 2016.

4.2 **Biologicals**: Any preparation made from organisms or micro-organisms or product of metabolism and biochemical reactions intended for use in the diagnosis, immunization or the treatment of human beings or animals or in research activities pertaining thereto.

4.3 **ColourCoding**: Colour coding of waste categories with multiple treatment options as defined in Schedule-I. The colours have been assigned to the containers/bags (yellow, red, white, blue), depending upon the types of waste, for collecting and segregating them at the generation place.

5.0 ABBREVIATIONS:

5.1 BMWM- Biomedical Waste Management

5.2 BMWU- Biomedical Waste Unit

5.3 CPCB- Central Pollution Control Board

5.4 CWS- Common Waste Site

5.5 CBWTF-Common Biomedical Waste Treatment facility

5.6 EC-Exposure code

5.7 SC-Source code

5.8 HCW- Health care worker

5.9 QA-Quality Assurance

5.10 QC- Quality Control

5.11 SOP-Standard Operating Procedure

6.0 RESPONSIBILITIES:

6.1 Medical Superintendent: Duties of Occupier

6.2 Addl MS: Addl MS (BMW): Duties of Occupier

6.3 Officer Incharge BMW: Duties of Occupier

6.4 **Laboratory Director /quality manager**: They ensure implementation of and adherence to this Manual in their Department. To ensure regular supply of articles from stores, ensures pretreatment (disinfectant, autoclave)

6.5 **Departmental Nodal Officer &/Nursing Officer &/ Technical Officer (BMW)**: She is responsible for ensuring segregation, adequate waste disposal, log book, register and training in the field, imparted to all categories of HCWs.

6.6 **All HCWs (Doctors, nurses, technicians)**: It is the responsibility of the concerned HCW to read and follow this Manual.

6.7 **Sanitary Suptd and Supervisors**: CWS record keeping and maintenance and training of sanitation workers

6.8 **Sanitation workers (Nursing Attendants)**: The Hospital arranges training for segregation and disposal of colour coded bags, from time to time for Group 'D' staff members.

7.0 **QUALITY ASSURANCE:** The Quality Assurance ensures compliance of the same.

8.0 PROCEDURE:

SJH Policy on Bio-medical waste management

As per BMWM (Principal) rules 2016 and BMWM (Amendment) rules 2018

8.1.1 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, recycling will be done by common biomedical waste treatment and disposal facility (CBMWTF). The hospital has provided the colour coded bags with its name inscribed over them along with logo for bio-medical hazard. The segregation of wastes is done at source of generation into yellow, red ,blue and white categories.

8.1.2 Yellow Categoty **(a)Human Anatomical Waste:** Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971): Yellow coloured non-chlorinated plastic bags. Dead Fetus

below the viability period (as per the Medical Termination of Pregnancy Act 1971, will be considered as human anatomical waste. This waste should be handed over to the CBMWTF in yellow bag with a copy of the official Medical Termination of Pregnancy certificate from the Obstetrician or the Medical Superintendent with stamp.

(b) Animal Anatomical Waste: Yellow coloured non-chlorinated plastic bags

(c) 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 Waste: 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 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 cytotoxiclabel.

(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, infected secretions, aspirated body fluids liquid from laboratory, labor room, OT and disinfecting activities etc should be collected separately and made safe by disinfection by chemical treatment using **1-2% sodium hypochlorite**[2] 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) chemical disinfection followed by shredding and customised to fit in nonchlorinated yellow bag for incineration.

(h) Microbiology, biotechnology waste Microbiology, biotechnology waste i.e. laboratory cultures, stocks or specimens of microrganisms, 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 their respective category to CBMWTF for disposal. 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. Pipette tips and other disposables are pretreated (disinfected in 1-2% Sodium hypochlorite solution), which is prepared fresh every day and then disposed in red category.

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.

8.1.3 **Blue category: Glass and metallic implants** 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 discarded and contaminated glass like slides and coverslips 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 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.

8.1.4 **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 (≥50μm). Yellow, Blue, Red and translucent bags/bins/containers are marked with Biohazard symbol, hospital logo and and barcoding is done at CWS . **BINS: Containment of waste**: An optimum number of easy to use, standard, uniform, covered, foot-operated bins of 4 colors i.e, yellow, red bins of appropriate size would be placed at identified places in all clinical areas. 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.

8.1.5 **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. The BMW register is maintained on site regularly at the point of generation. 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, BMWU 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: Daily from all areas. Done twice daily or more frequently from labor rooms/ OTs/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 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 log book color code wise mentioning the number and size of bags handed over and sign the slip for further record. 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 is done of the BMW bags and containers as per Barcoding guidelines before handing over to CBMWTF vehicle. 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.

8.1.6 The bags are collected from the sites by persons, given contract for the sweeping and cleaning of the hospital (BVG –Bharat Vikas Group).

Personnel involved in transporting the wastes are provided with PPE like- masks, industrial gloves, safety glasses and safety shoes/gum boots and are properly trained. The tied bags are never opened while transporting them.

8.1.7 **Transportation to CBWTF:** The operator of CBWTF 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 and BMWM (amendment), rules 2018, 2019.[1,2] 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.

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 CBWTF
	(d) Expired or Discarded Medicines: antibiotics, cytotoxic drugs	Yellow coloured non-chlorinated plastic bags or containers with cytotoxic labels	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.
	(e) Chemical Waste: solid discarded chemicals	Yellow coloured non-chlorinated plastic bags or containers	Disposed of by incineration by CBWTF

	(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. **Masks (including triple layer mask, N95 mask, etc.), head cover/cap, shoe-cover, disposable linen Gown, non-plastic or semi-plastic coverall**	Non-chlorinated yellow plastic bags or suitable packing material	Non-chlorinated (alcoholic: 5%lysol, 5% phenol) chemical disinfection followedby 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 CBWTF 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 needles cut) and gloves Latex/nitrile(nicked)	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

	Goggles, face-shield, splash proof apron, Plastic Coverall, Hazmet suit, nitrile gloves Pre-treat viral transport media, plastic vials, vacutainers, eppendorf tubes, plastic cryovials, pipette tips		
White (Translucent)	**Waste sharps**	Puncture proof, Leak proof, tamper proof containers	Disinfection/Autoclaving or dry heat sterilization/ sent to CBWTF 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	Puncture proof and leak proof boxes or containers with blue coloured marking	Autoclaving/Microwaving/hydroclaving by CBWTF and then recycling. Contaminated glass slides require pretreatment (disinfection by sodium hypochlorite)
	Metal implants/metal guns etc	Puncture proof and leak proof boxes or containers with blue colored marking	

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

**For disinfection of BMWM 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 by autoclaving-then their respective category plastic (red)/glass (blue)

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 BMWM (Amendment) rules, 2018. Government of India Ministry of Environment, Forest and Climate Change. Notification; New Delhi, the 16th March, 2018.

3 BMWM (Amendment) rules, 2019. Government of India Ministry of Environment, Forest and Climate Change. Notification; New Delhi, Feb., May, 2019.

8.2 **Collection of Bags, Boxes and Containers**: The hospital has outsourced the final disposal of BMW to M/s SMS Water Grace since June 2012.

8.2.1 BMW bags, containers and boxes are collected by the M/s SMS Water Grace BMW Pvt. Ltd. Twice daily at a fixed time.

8.2.2 Solid waste is collected by New Delhi Municipal Corporation directly every day.

8.3 **Waste Accumulation and Storage**:

8.3.1 The untreated bio-medical wastes are not allowed to be kept stored beyond a period of 48 hours.

8.4 **Treatment and Disposal of wastes**:

8.4.1 The hospital has out sourced the disposal to CBMWTF (M/s SMS Water Grace BMW Pvt. Ltd") as per mandate of BMWM rules 2016, 2018 & 2019.

8.4.2 Needles are to be destroyed or cut in Needle destroyer/needle cum hub cutter immediately after blood collection.

8.4.3 Sample disposal: Blood, body fluids and other samples, other infectious liquid waste like OT suction aspirates, suction drains etc should be made safe by pretreatment (disinfected in equal quantity of 1%-2% Sodium hypochlorite, etc) before disposal into sewer or drain and the effluent shall have to comply with the norms as mentioned in Schedule II.

8.4.4 The solid and liquid culture media with growth and vacutainers with blood samples should be autoclaved at 121^0C (15 lbs pressure) for 1 hour in autoclavable safe bags, before disposal in their respective category red (plastic) or blue (glass).

8.5 **Autoclaving:**

8.5.1 Autoclaving is a time-tested process of sterilization of medical waste using high temperature and high pressure steam. Typical operating conditions for autoclaving of biomedical waste are - temperature of 121° C at a pressure of 15 lbs for a period of at least 60 minutes and as per standards and validation tests.[1,2,3]

8.6 Important points related to BMW from COVID-19 WARD/ICU/LAB dealing with BMW from COVID-19 pts

- Keep separate color coded bins (with foot operated lids)[1]/bags/containers in wards and maintain proper segregation of waste as per BMWM Rules, 2016 as amended and CPCB guidelines for implementation of BMW Management Rules, BMWM (Amendment) Rules 2018,2019

- BMW bins/containers and Solid waste bins should be kept separate.

- Pre-treatment is not necessary for all of the biomedical waste generated at COVID ward,however, pre-treatment (autoclaving) of infectious laboratory wastes would be necessary as prescribed under BMW Rules, 2016;

- As precaution double layered bags (using 2 bags) should be used for collection of waste from wards so as to ensure adequate strength and no-leaks;

- Collect and store biomedical waste separately prior to handing over the same CBWTF. Use a dedicated collection bin labelled as "COVID-19" to store COVID waste and keep separately in temporary storage room prior to handing over to authorized BMW sanitation worker.

- In addition to mandatory labelling, bags/containers used for collecting biomedical waste should be labelled as "COVID-19 Waste". This marking would enable CBWTF to identify the waste easily for priority treatment and disposal immediately upon the receipt.

- **General waste should be disposed as solid waste as per SWM Rules, 2016: General solid waste comprising of wrappers of medicines/syringes etc., fruit peel offs, empty juice bottles or tetra packs, used water bottles, discarded papers, carton boxes of medicines, empty bottles of disinfectants, left-over food, disposable food plates, etc. should be collected separately as per SWM Rules, 2016.**

- **No general waste is to be disposed off in BMW biohazard yellow, red, blue bags.**

- Used masks, used tissues, used toiletries, etc. used by COVID-19 patient shall become biomedical waste and shall be segregated in yellow bag

- Maintain separate record of waste generated from COVID-19 wards

- Use dedicated trolleys and collection bins in COVID wards. A label "COVID-19 Waste" to be pasted on these items also.

- The (outer and inner) surface of containers/bins/trolleys used for storage of COVID-19 waste should be disinfected with 1% sodium hypochlorite solution daily. In addition to mandatory labelling, bags/containers used for collecting biomedical waste from COVID-19 wards, should be labelled as "COVID-19 Waste". This marking would enable CBWTFs to identify the waste easily for priority treatment and disposal immediately upon the receipt.

- Feces from COVID-19 confirmed patient, who is unable to use toilets and excreta is collected in diaper, must be treated as biomedical waste and should be placed in yellow bag/container. However, if a bedpan is used, then faeces to be washed into toilet and cleaned with a neutral detergent and water, disinfected with a 0.5% chlorine solution, then rinsed with clean water.

- **Collect used PPEs such as goggles, face-shield, splash proof apron, Plastic Coverall, Hazmet suit, nitrile gloves into Red bag;**

- **Collect used masks (including triple layer mask, N95 mask, etc.), head cover/cap, shoe-cover, disposable linen Gown, non-plastic or semi-plastic coverall in Yellow bags.**

- **Pre-treat viral transport media, plastic vials, vacutainers, eppendorf tubes, plastic cryovials, pipette tips as per BMWM Rules, 2016 and collect in Red bags**

- **Segregation of biomedical waste and general solid waste should be done at the point of generation in ward/isolation rooms/ICU. There should be no segregation of biomedical waste and solid waste at temporary waste collection / storage are (Common Waste Site) of healthcare facility of ensure occupational safety.**

- **PPEs doffed by healthcare workers accompanying diseased body of COVID-19 patient to crematorium / graveyards should be treated as biomedical waste and disposed as per provisions under BMW Management Rules, 2016. Healthcare staff to take-back the PPEs after collecting it in red and yellow bags/bins provided in the hospital ambulance itself or healthcare workers to doff the PPEs at the red and yellow bins kept at hospital mortuary as per Policy.**

- Sewage Treatment Plants should continue to ensure disinfection of treated wastewater as per prevailing practices to inactivate coronaviruses.

- Operators of ETPs/STPs should place yellow and red bins in the plant site and dispose their personal protective equipment (PPE) in the colour coded bins as mentioned earlier

- During the period of COVID-19 pandemic, utilization of treated wastewaters within HCFs may be avoided.

- The COVID-19 wards/ICUs/Fever Screening Clinic/ HCW screening clinic/SARI Ward/OTs/Labs will report opening of such dedicated facilities for COVID-19 to BMW unit through Med Suptd so that same can be informed to DPCC and CBWTF. This will ensure that the generated BMW from COVID-19 facilities can be managed at HCF and to expedite its disposal at CBWTF as per mandate of CPCB guidelines, 2020 as revised.

- Report opening or operation of COVID-19 wards/ICUs/Fever Screening Clinic/ HCW screening clinic/SARI Ward/OTs/Labs to SPCBs: Delhi Pollution Control Board, CPCB are being notified by BMW unit through Med Suptd. in phase wise manner on intimation by the respective COVID-19 facilities to BMW unit through MS.

8.7 Occupational hazards due to mismanagement of BMW: The health hazards due to improper waste management can affect –

8.7.1 The occupants in institutions and spread in the vicinity of the institutions.

8.7.2 People happened to be in contact with the institution like laundry workers, nurses, emergency medical personnel, and refuse workers.

8.7.3 Risks of infections outside hospital for waste handlers, scavengers and (eventually) the general public.

8.7.4 Risks associated with hazardous chemicals, drugs, being handled by persons handling wastes at all levels

8.7.5 Injuries from sharps and exposure to harmful chemical waste and radioactive waste also cause health hazards

8.8 Training and Education:

8.8.1 Regular 3-4 training programmes are organized in the hospital every month for all the categories of staff to educate them about the BMWM.

9 Prophylaxis:

9.7 The risk of transmission of blood borne viruses to health care workers (HCWs) by percutaneous exposure is .05-0.4%, 9.0-30.0% and 3.0-10.0% for HIV, HBV and HCV, respectively.

9.8 Following exposure, wash needle-stick exposure region and cuts with soap and water.

9.9 Flush with water splashes, if the exposure region is nose or mouth or skin.

9.10 Irrigate eyes with clean water.

9.11 Pricked fingers should not be taken into mouth.

9.12 The wound should not be squeezed.

9.13 Administration of PEP to HCW depends upon the exposure code (EC) of the HCW and HIV status code (HIV SC) of exposure source.

9.14 Report the accident of exposure to the HOD and Casualty Medical officer.

9.15 The PEP drugs are available with the Casualty Medical officer.

9.16 Make entry in the "Incident Register" and fill up the appropriate form.

10 Documentation:

10.7 The entry of number of each colour coded bag, box or container should be entered daily.

10.8 Upon exposure, the incident should be reported to the HOD and Casualty Medical officer for appropriate action and the 'Incidence Report Form" should be filled up along with making entries in the "Occurrence &Incidence Register".

11 References:

1. Bio-Medical Waste Management 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. BMWM (Amendment) rules, 2018, MoEF & CC, Gazette notification , 16.03.2018
3. BMWM (Amendment) rules, 2019, MoEF & CC, Gazette notification , Feb, May
4. Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016 , by CPCP and MoHFW, June 2018
5. Guidelines for Handling, Treatment and Disposal of Waste generated during Treatment/Diagnosis/Quarantine of COVID-19 patients, CPCB, Version4, 17 July 2020
6. **Appendices and forms:** Annexure-I, II, III
7. **Validity Statement**:This document is valid for one year from the date of issue.

ANNEXURE- I

PROTOCOL FOR NEEDLE STICK INJURY AMONG HEALTH CARE WORKERS

UPON EXPOSURE TO SHARPS INJURY

1. Sharp/Needle prick, cuts should be washed thoroughly with soap and water.
2. Pricked finger should not be put into the mouth.
3. The cut should be covered with a water-proof dressing.
4. Splashes to nose, mouth or skin should be flushed with plenty of water.
5. Eyes should be rinsed thoroughly with clean water.
6. The use of a caustic agent such as bleach should be avoided.
7. The exposure incident should be reported to the hospital authorities or a senior immediately, as Post Exposure Prophylaxis (PEP) may be required to be started soon (within few hours).
8. During the follow-up period, especially 6-12 weeks, the HCW should refrain from blood, semen and organ donations.

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ANNEXURE- II

PREPARATION OF 1% WORKING SOLUTION FROM 4% STOCK SOLUTION OF SODIUM HYPOCHLORITE

REQUIRED VOLUME OF WORKING SOLUTION (ml)	QUANTITY OF SODIUM HYPOCHLORITE (ml)	QUANTITY OF WATER (ml)
250	62.50	187.50
500	125	375
1000	250	750
2000	500	1500

Management of spillage of blood and other body fluids

1. Spilt blood should not be allowed to dry as potential aerosol production is greater from the dried blood.
2. Cordon off the area of spill.
3. Wear heavy duty gloves.
4. Assess the size of the spill (small/ medium/ large).
5. Cover the spill area with absorbent material like filter paper, gauze or cotton.
6. Decontaminate the large spill by flooding with an equal amount of 10% Sodium hypochlorite solution. For small spill 1-2%
7. Allow to act for 20 to 30 minutes.
8. Remove the absorbent material with gloved hands, starting from periphery to the centre of the spill.
9. If broken glass is present, first decontaminate the spillage as above, then carefully remove the pieces of glass with disposable forceps or scoop to a sharps bin, before wiping up.
10. Discard the infectious material in yellow bags to be sent to incinerator.
11. Wipe the surface clean with a cloth dipped in disinfectant.
12. Finally, the area should be washed with water and detergent and allow it to dry.

Authorised signatory-

Date: