

Technical Guidance: Medical Waste Management Response to COVID-19

July 2020

1. BACKGROUND

In Dhaka North City, Dhaka South City and Chattogram City, medical waste, including infectious waste due to the COVID-19, is rapidly increased. It causes unsafe situation by illegal dumping of medical waste in public places. Although the Government of Bangladesh is developing a draft medical waste management guideline for COVID-19 related services at the national level, there is a lack of official guidance on how to adapt regular medical waste management services to pandemic situation at the city corporation (CC) level with a limited existing capacity of medical waste treatment facilities. This guideline will also help city corporations for the management of the quarantine areas medical waste. This guidance is aiming to clarify the CC's medical waste management response strategy to the COVID-19 situation, including emergency measures to secure the supplemental treatment capacity of infectious waste. For the detail information of solid waste management in CCs against the COVID-19, please refer to ***“Guidelines for Solid Waste Management During the COVID-19 Pandemic”***.

2. BASIC STRATEGY

CCs will build a cooperative relationship with the Health Care Establishments (HCEs) and the Designated Medical Waste Management Organizations (DMWMOs) to establish appropriate medical waste management system. Basic strategy describes main messages from CCs to HCEs and DMWMOs in principle based on their role and responsibility for medical waste management.

Health Care Establishments (HCEs)

- a) Infectious medical waste due to the COVID-19 can be treated in the same as other infectious waste.**
- b) All HCEs (hospitals and clinics) should have their own treatment facilities of medical waste on site or contract with the DMWMO.
- c) HCEs should obey the discharge rules of medical waste (segregation at source). Ideally, all potentially infectious waste should be isolated and sealed.**
- d) In the case of Institutional/Home Quarantine center/area, infectious waste due to COVID-19 should store in a separate bag and DMWMOs should collect that waste.
- e) A record should be maintained of waste generated from COVID-19 isolation wards/ quarantine area.

- f) Utility gloves or heavy-duty, reusable plastic aprons should be used repeatedly after sterilization as far as possible to reduce waste volume, while single-use gloves made of nitrile or latex, and gowns **MUST** discarded as infectious waste after each use and not reused.
- g) On-site temporary storage and thermal treatment of potentially infectious waste from HCEs in the city needs to be enforced.

Designated Medical Waste Management Organizations (DMWMOs)

- a) All HCEs (hospitals and clinics) should have their own treatment facilities of medical waste on site or contract with the DMWMOs.
- b) If thermal treatment for infectious waste is not possible, adequate and **safe sanitary landfill measures MUST be put in place.**

■ **Designated Medical Waste Management Organizations (DMWMOs)**
 In Dhaka South and North City: PRISM Bangladesh Foundation
 In Chattogram City: Chattogram Seba Sangstha (CSS)

3. PRESENT CONDITION OF MEDICAL WASTE TREATMENT

Categories of Medical Waste

“Medical Waste (Management and Processing) Rules (2008)” defines the type of waste as shown in Table.1. There are 11 categories of waste that have one Non-hazardous medical waste and 10 hazardous medical wastes. Currently, only 6 color codes are used to separate waste generated in categories of general, infectious, sharp, recyclables, liquid, and radioactive.

Table.2 shows the categories of medical waste and the responsible organizations. The general waste, including non-infectious waste, is collected by CCs. And infectious/sharp/recyclable waste are collected by DMWMOs. Infectious waste is disposed by incinerator which owned by CC in Dhaka South and North City, open burned in Chattogram City. In reality, medical waste, discharged from HCEs who have not signed up with NGOs, is mixed with general waste and dumped at landfill directly without treatment.

Table.1 The type of medical waste*

Large Category of Waste	Category of Waste defined by Medical Waste Rules
Non- Hazardous	<ul style="list-style-type: none"> • General
Hazardous	<ul style="list-style-type: none"> • Infectious • Anatomical (Collected as Infectious) • Pathological (Collected as Infectious) • Sharp • Recyclables • Liquid • Radioactive • Chemical • Pharmaceuticals • Pressurized (Collected as Recyclables)

Table.2 Categories of Medical Waste and organization*

Color Code	Category of Waste	Responsible Organization
Black	General	CCs/ Pourashava
Yellow	Infectious	DMWMOs
Red	Sharp	DMWMOs
Green	Recyclable	DMWMOs
Blue	Liquid	-
Silver	Radioactive	- (Bangladesh Atomic Energy Commission)

Note: Little data is available for liquid and radioactive waste

Medical waste flow

Fig.1 shows a waste flow diagram of medical waste with major treatment methods in three CCs. Different treatment methods are selected or combined depending on characteristics of the waste. There is little information of liquid waste and radioactive waste.

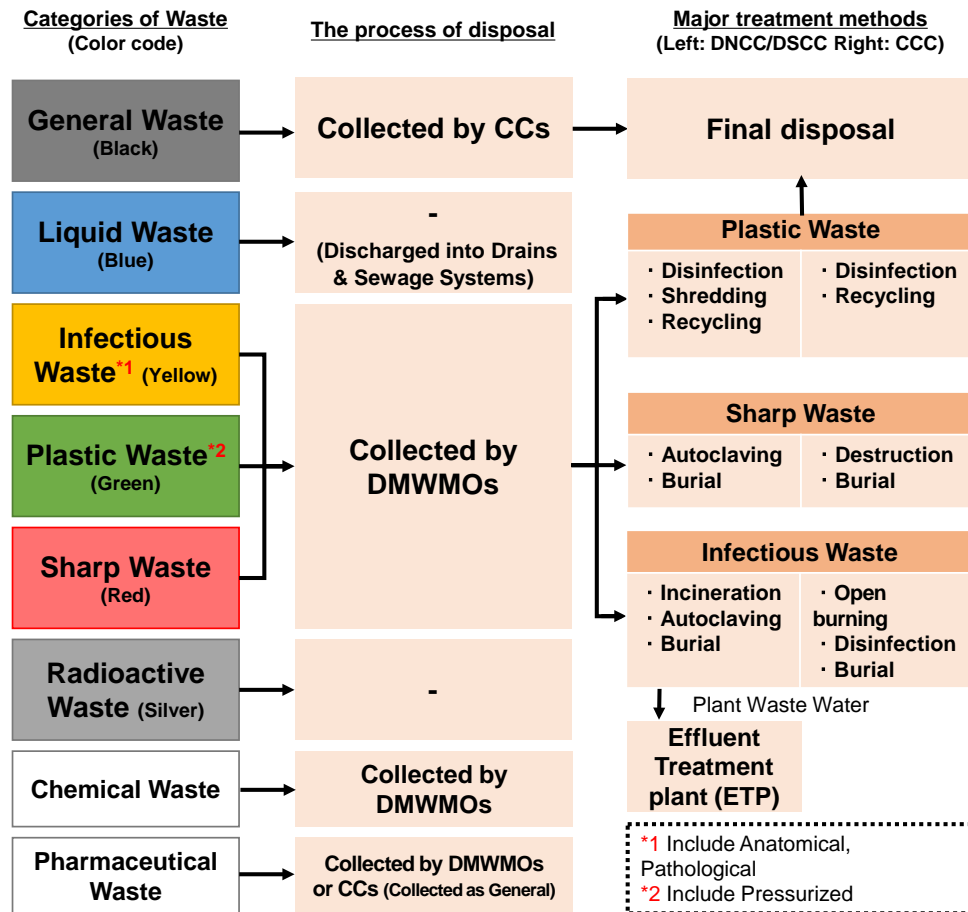


Fig.1 Waste flow diagram of medical waste

(Source of *Table.1/Table.2/Fig.1) JICA Project Team, “Survey Report on Medical Waste Management in Dhaka South and North City (2018)”

Overview of Disposal method based on “Medical waste (Management & Handling) Rules-2008”

- Incineration:** Incineration is the burning of waste at high temperatures by the incinerator.
- Open burning:** Open burning in a ditch or over Concrete slab is the least option for treatment and disposal waste, where incineration and autoclaving procedure are not available, and volume of generated waste is small.
- Autoclaving:** Steam under pressure is used to obtain a temperature of at least 140°C. Dedicated Autoclave machine should be used for waste treatment.
- Disinfection:** All used medical equipment’s will be treated as infected materials, so immediate after use all reusable equipment’s/logistics should be disinfected by suitable disinfectant solutions.
- Treatment & Disposal option for Sharp items:** Generally sharp wastes are non-incinerable item. It could be autoclaving for disinfection. Sharp waste treat and disposed by Concrete pit method or Deep burial pit method.
- Burial:** Especially for Primary / Secondary level Hospital, Incineration process or Dedicated Autoclaving facility are not available, and volume of waste is low, Burial should be done in secured area.

4. ASSESSMENT FLOW

The assessment flow of medical waste management response to COVID-19 can be used for developing a strategic plan of the necessary actions in each stage.

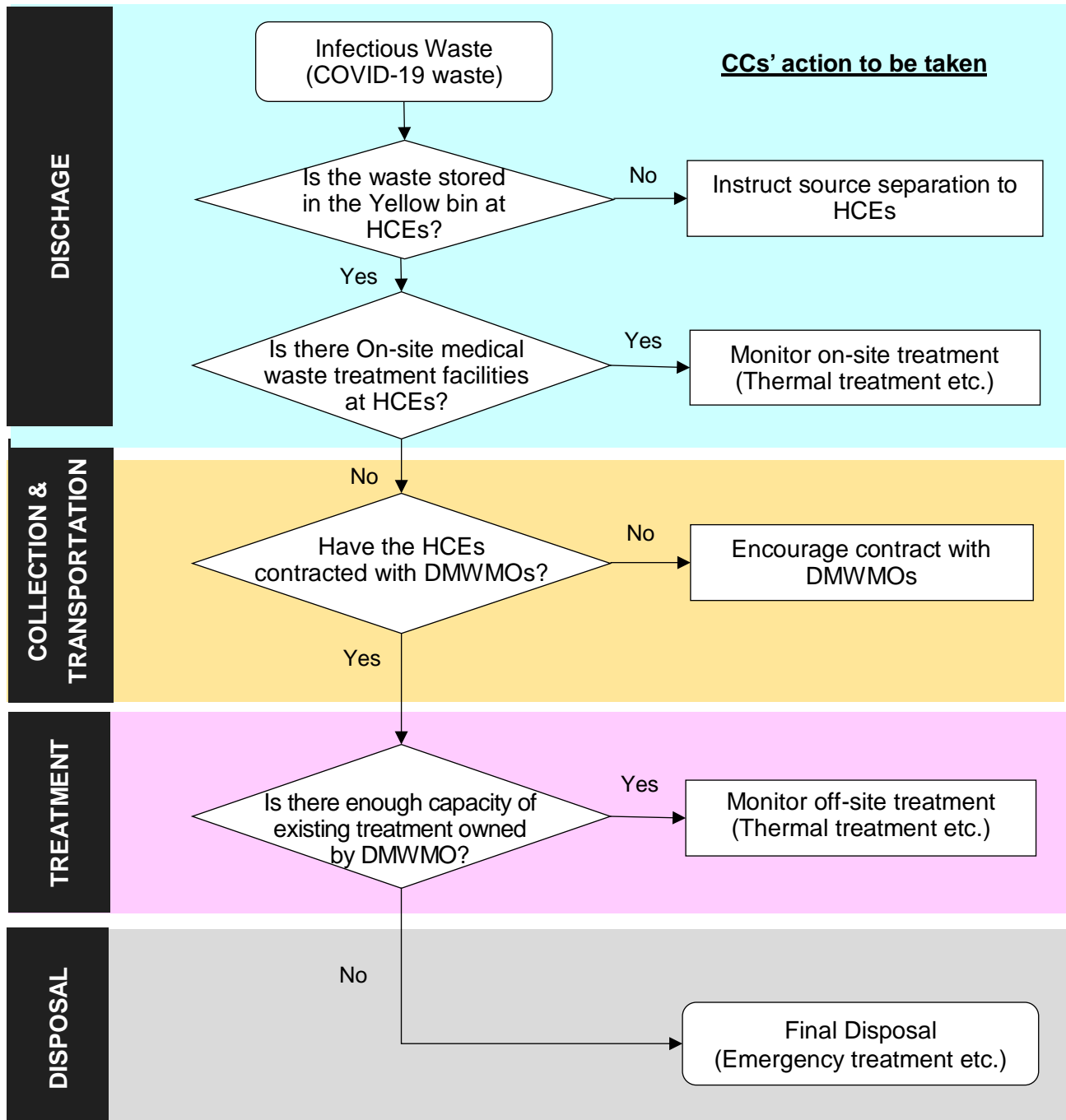


Fig.2 Assessment Flow of Medical Waste Management Response to COVID-19

5. ESSENTIALS OF MEDICAL WASTE MANAGEMENT

(1) Separate Infectious Waste at Source

- a) Potential sources or places where generate COVID-19 affected health care hazardous waste should be identified and managed by CCs based on the latest HCEs registration database.
- b) All health-care waste produced during patient care, including those with confirmed COVID-19 infection, is considered to be infectious (infections, sharps and pathological waste) and should be collected safely in Yellow bins. If yellow bins are not available, containers such as plastic box, plastic bag and cardboard can be used for safe storage.



Yellow bins

!! ATTENTION!!

- ☞ Please dispose the waste which mention below to **Yellow Bins** (Infectious Waste)
 - Masks used by suspected or confirmed COVID-19 patients and medical staffs who treated them
 - All the waste used for medical treatment on COVID-19 patients
- ☞ If there is a problem in categorization of waste, treat the waste as Infectious waste. COVID-19 waste will keep in biomedical yellow colored bag with proper labelling.

(2) Appropriate Contract Management of Medical Waste Disposal

- a) If HCEs don't have appropriate treatment facilities of medical waste on site, they should contract with the DMWMOs.

!! ATTENTION!!

- ☞ There is not enough capacity of transportation and treatment facilities of medical waste, hence CCs will increase DMWMOs to supplement the capacity.
- ☞ Portable autoclave or incinerator units may be used to support existing infectious medical waste infrastructure for the enhancement of the existing capacity of treatment.

(3) Ensure Safe Waste Treatment and Disposal

- a) If thermal treatment for infectious waste is not possible, the collected waste should be put in separate cells, covered at least daily with locally available material and access limited to a few personnel.

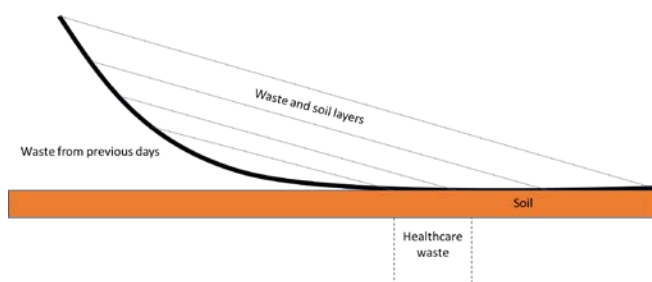
!! ATTENTION!!

☞ In the present circumstances, it is impossible to treat all infectious waste properly, hence CCs have to carry out emergency treatment for appropriate disposal.

- b) As an emergency treatment measures, CCs will adopt either following landfill methods proposed by World Health Organization (WHO):

1) Landfill in the tipping area

In a shallow hollow excavated in mature municipal waste (preferably over three months old) immediately in front of the base of the working face where waste is being tipped. When a load of health-care waste has been deposited, it would be covered during the same day by the advancing tipping face of fresh municipal waste (preferably creating a layer of municipal waste around 2m thick).



(Source) International Solid Waste Association (ISWA) "How to dispose of healthcare waste in landfills during the COVID19 crisis?" March 2020

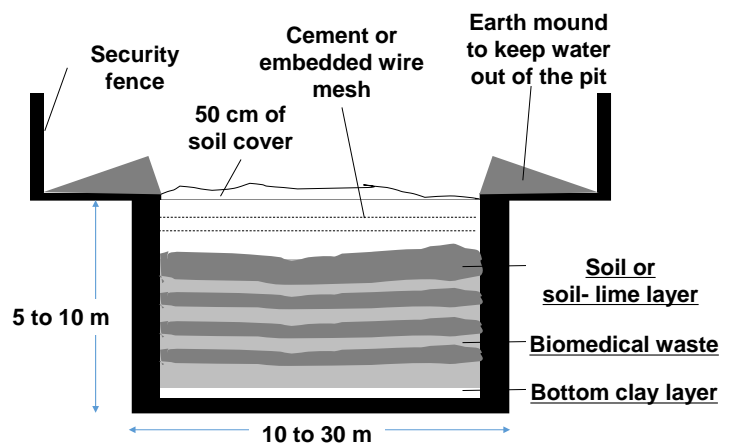
Scavenging in this part of the site must be prevented.

2) Landfill in the old part of sites

In a deeper (5–10 m) pit excavated in a covered area of mature municipal waste (i.e. waste at least three months old). The pit is then backfilled with the mature municipal waste removed previously, and an intermediate soil cover (approximately 30 cm) or topsoil cover (up to 1 m). Scavenging in this part of the site must be prevented.

3) A special burial pit

Dig a pit 10–30 m wide and 5–10 m deep. The bottom of the pit should be at least 2 m above the groundwater. Line the bottom of the pit with clay or permeable material. Construct an earth mound around the mouth of the pit to prevent water from entering. Construct a fence around the area to prevent unauthorized entry. Inside the pit, place alternating layers of waste, covered with 10 cm of soil (if it is not possible to layer with soil, alternate the waste layers with lime). When the pit is within about 50 cm of the ground surface, cover the waste with soil and permanently seal it with cement and embedded wire mesh.



(4) Protect Waste Workers, formal and informal

- a) All workers, formal and informal, must be trained on the risks and hazards associated with the exposure to the virus, as well as on appropriate workplace protocols to prevent/reduce the likelihood of exposure and infection.
- b) For further information on how to protect waste workers, please refer to “**Guidelines for Solid Waste Management During the COVID-19 Pandemic (Draft)**”

!! ATTENTION!!

- ☞ Drainage cleaners and road cleaners should be trained not to touch infectious/hazardous waste even if they are scattered on the road.
- ☞ No container (Bio-hazard bags/ Bins) should be filled more than 3/4th of its size.
- ☞ The inner and outer surface of the Medical Waste transport equipment (container, truck cage, cargo, hand cart etc.) should be cleaned properly and disinfected daily after emptying/use.