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BIO-MEDICAL WASTE MANAGEMENT IN INDIA: A LEGAL FRAMEWORK

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Abstract

Bio-medical waste generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals², As per the rules³, it is the duty of every occupier of every institution to take care of these measures generating the bio-medical waste.

Hygiene, sanitation and healthy environment is not only an integral process of the natural running cycle but it is a fundamental right of every single creature on the earth, whether it's human beings, animals, plants and micro-organisms. The rights includes but not limited to the right to health and sanitation merely, it has its wing spread around all over and when the environment is hampered, out.

Speaking of the health and sanitation, proper disposal of the waste generated by the hospital is extremely necessary. Bio-medical waste can cause a profound danger to each element of the environment. It can cause damage to the land, take out the natural essence of the land can negatively affects the aquifers, it pollutes the water, and it possess the capacity to jeopardize many lives on the earth. Bio-hazardous substance if not handled carefully then one can't anticipate the amount of injury it can cause.

These bio-medical wastes are not only limited to a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, labs, blood bank but in our houses too. Most of the human beings do not have the tendency to segregate the waste. Necessary steps to ensure that such waste is handled without any adverse effect to human health and the environment. Such caution in each stages, such as at the time of segregation, packaging, transportation, storage, disposal has to be made according to the guidelines. Considering the contemporary scenario, where the outbreak of pandemic not only imposed a threat on human lives but also levied a heavy risk on

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²<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4925840/#:~:text=Biomedical%20waste%20is%20defined%20as,testing%20of%20biologicals%20%5B1%5D>. (Last visited 18 Jan 2021).

³ Bio-Medical Waste (Management and Handling) Rules, Duties of the Occupier, section 4, Published vide Notification No. G.S.R. 343(E), 2016, (India).

the environment too, in this article we will analyse that to what extent we haven't been successful in tackling with the problems or failed to do so.

1. Introduction

Bio-medical waste is a waste that is considered as the natural part of the life cycle waste, in general it occurs when any organism returns substances to the environment. Living things that take in raw materials and evacuate wastes that are recycled by other living organisms, which is a natural phenomenon. However, it has been established that humans produce an additional flow of material residues that would overload the capacity of natural recycling processes. Therefore, the wastes essentially have to be managed in order to reduce their effect on our aesthetics, health, or the environment. Solid and fluid, hazardous and non-toxic wastes are generated in households, offices, schools, hospitals, and industries. No society is immune from day-to-day issues associated with the waste disposal. Generally in our household also we don't have bifurcation of the wastes and how waste is handled often depends on its source and characteristics, which not all of us are aware of as well. Practices generally differ for residences and industries, in urban and rural areas along with rules, policies made by any local, state, and central regulations that govern its management.⁴ In a general sense, to put it in a nutshell we can say waste originating from the medical institutions are known as Bio-Medical Waste.⁵ Bio Medical waste is any kind of waste that contains infectious material (or material that's potentially infectious).⁶ It includes waste generated by healthcare facilities like physician's offices, hospitals, dental practices, clinics, laboratories, medical research facilities, and veterinary clinics.⁷ Medical waste contains bodily and materially fluids and other contaminants. "Bio Medical waste generated during medical research, testing, diagnosis, immunization, or treatment of either human beings or animals. Some examples could be - culture dishes, glassware, bandages, gloves, discarded sharps like needles or scalpels, swabs, and tissue. The list is not inclusive"⁸ Thus, medical waste, also known as biomedical waste, clinical waste, biohazardous waste, etc. it all refers to waste created during the healthcare process that's either contaminated or potentially contaminated by infectious material and substances. The World Health Organization (hereinafter referred to as WHO) has categorized

⁴ <https://enviroliteracy.org/environment-society/waste-management/what-is-waste/> (Last visited 12/10/2020)

⁵ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4925840/> (Last visited 12/10/2020)

⁶ <https://www.medprodisposal.com/what-is-medical-waste-medical-waste-definition-types-examples-and-more> (Last visited 12/10/2020)

⁷ <https://www.medprodisposal.com/what-is-medical-waste-medical-waste-definition-types-examples-and-more> (Last visited 12/10/2020)

⁸ United States Medical Waste Tracking Act, 1988. (Last visited 12/10/2020)

sharps, human tissue, fluids, and contaminated supplies as “biohazardous” and non-contaminated equipment and animal tissue as “general medical waste.”⁹

Management of the Bio-Medical Waste (Pre- COVID-19)

The primary concern factor is the management of the Bio-medical waste (hereinafter referred to as BMW) it ought to be isolated from the general waste stream to guarantee the extraordinary dealing with and treatment required for this waste, since we know that the general waste and bio-medical waste requires discrete attention. Persons dealing with biomedical waste should consistently utilize individual defensive hardware, substances, equipment required in dealing with such waste disposal. “Sharps”¹⁰ and it ought to be set into an unbending and cut safe sealed holder committed explicitly for that reason and all the associated elements with regard to handling should be taken.

Problems Involved in the Management of BMW

There are various reasons prompting ill-treatment of medical waste by the medical services providers, we have witnessed many cases in history.

A few of the most widely recognized reasons that to be found underneath are:

- Lack of mindfulness about the inalienable dangers, inbuilt in the nature brought about by inappropriate management;
- Inadequate guidelines, instructions.
- Improper control of the waste administration framework;
- Absence of a national arrangement for the proper and systematic administration of health care wastes;
- Lack of or deficient system, and regulatory framework
- Insufficient proof on the negative effect of medicinal services on certain proficient groups
- Deficiency of proper investigation with regard to disposal according to the rules

⁹ <https://www.mwawaste.com/services/biohazard/> (Last visited 12/10/2020)

¹⁰ <https://www.jove.com/science-education/10403/proper-waste-disposal> (Last visited 12/10/2020)

- Insufficient data on sound waste management and treatment choices and their benefits etc.

Likewise, there are numerous reasons behind the lack, other reasons apart from these would be the absence of political will and act to create and actualize a legitimate administration and following the same has always been in issue, since these processes requires high numbers of financial consideration, that's the reason by several times it suffers ignorance on many levels. In addition to this, the fundamental relations among circumstances, cause and effects are uncanny, we can't anticipate what danger it can possess and cause on the environment. There may likewise be different reasons that are explicit can has been held more inadequate.¹¹

Illegitimate or improper transfer of untreated healthcare waste can degrade drinking and ground water in landfill, not all of us are aware of the fact that how it can cause danger to the aquifers and additionally discharge risky chemical substances in the earth which again destroys the land and takes out the natural essence from the earth. Inadequate and unsuitable waste cremation can likewise discharge perilous toxins noticeable all around, which can produce dioxins and furans, substances which have been connected to malignant growth and other unfavourable wellbeing conditions, at times, it barrens the land as the land absorbed these chemicals and it can last for years. Substantial metals, whenever burned, can prompt the dissemination of poisonous metals in the earth these again reduce the quality of land.¹²

One of the riskiest kinds of biomedical wastes is "sharps". These incorporate utilized syringes and scalpels. As the name infers, sharps can cut the individual who all are handling them. We are not being cautious in dealing with these substances for sure. The numbers are disturbing as it was found in a study of "the World Health Organization (WHO) it has submitted the report of estimates that 40% of hepatitis cases and 12% of HIV cases worldwide are caused by occupational exposure."

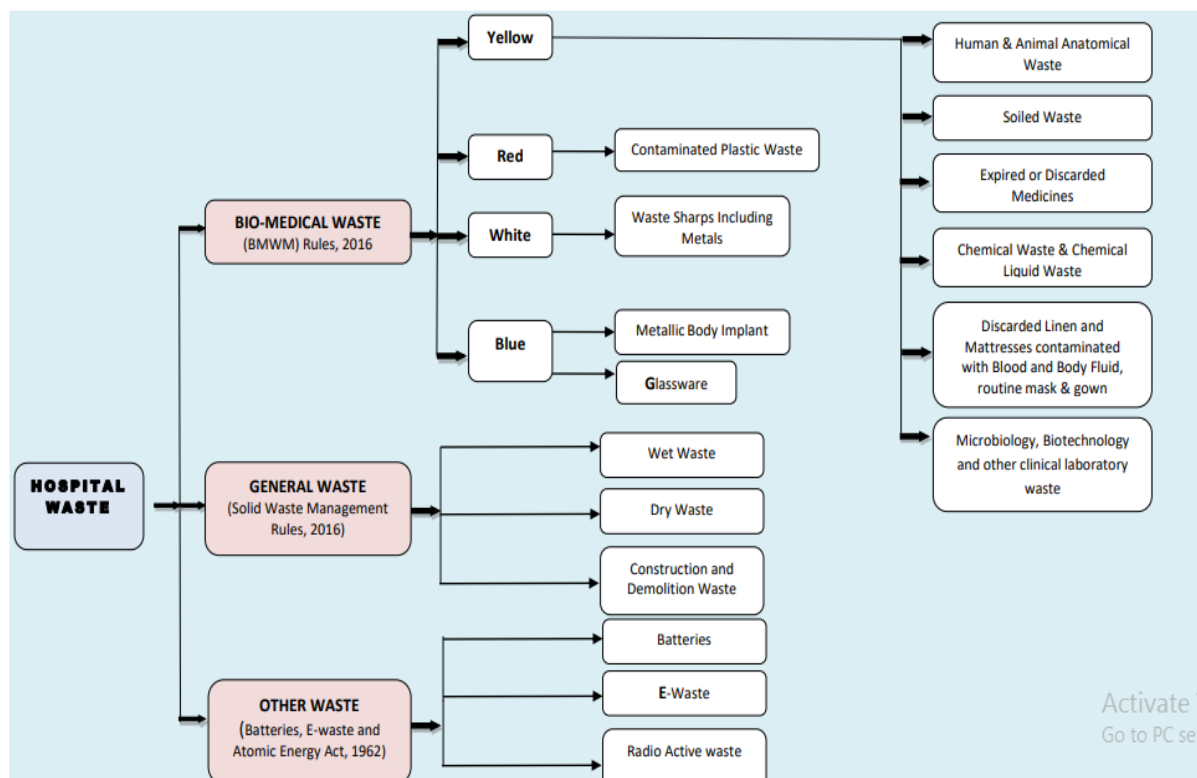
Hospitals likewise produce unlimited quantities of toxic substances, concoction, pharmaceutical, and radioactive waste which requiring specific handling. Add to this heap there are lot of normal trash, for example, nourishment wrappers and utensils, which can make up

¹¹ https://www.who.int/water_sanitation_health/medicalwaste/Polanalysis.pdf (Last visited 6/3/2020)

¹² <https://www.bioenergyconsult.com/challenges-in-hazardous-medical-waste-management/> (Last visited 6/3/2020)

80% of the waste stream.¹³ A bigger emergency clinic can create as much as a huge amount of waste ordinary.¹⁴

Categorization & Classification of Wastes in Health Care Facilities¹⁵.



The problems associated with Bio-medical waste in Indian healthcare delivery system is categorized into two major components – public and private.

a) Public Hospitals

The Government, i.e. public healthcare system comprises limited secondary and tertiary care institutions in key cities and focuses on providing basic healthcare facilities in the form of primary healthcare centers (PHCs) in rural areas. Public healthcare is free for those below the poverty line. The public health sector encompasses 18% of total outpatient care and 44% of

¹³ <https://www.jove.com/science-education/10403/proper-waste-disposal> (Last visited 6/3/2020)

¹⁴ <https://noharm-asia.org/content/asia/medical-waste-know-issue> (Last visited 6/3/2020)

¹⁵ <https://tspcb.cg.gov.in/Shared%20Documents/Guidelines%20for%20Management%20of%20Healthcare%20Waste%20Waste%20Management%20Rules,%202016%20by%20Health%20Care%20Facilities.pdf> (Last visited 6/3/2020)

total inpatient care. Middle and upper-class individuals tend to use public healthcare less than those with a lower standard of living. Additionally, females and elderly use public services more. The public health care system was originally developed in order to provide a means to healthcare access regardless of socioeconomic status.

b) Private Hospitals

The private sector provides a majority of secondary, tertiary and quaternary care institutions with a major concentration in metros, tier I and tier II cities. With the help of numerous government subsidies in the 1980s, private health providers entered the market. In the 1990s, the expansion of the market gave further impetus to the development of the private health sector in India. After 2005, most of the healthcare capacity added has been in the private sector, or in partnership with the private sector. The private sector consists of 58% of the hospitals in the country, 29% of beds in hospitals, and 81% of doctors. According to National Family Health Survey-3, the private medical sector remains the primary source of health care for 70% of households in urban areas and 63% of households in rural areas.¹⁶

Public health & Hospitals being a State subject, State Governments are primarily responsible for up-keeping, providing health care to people and maintaining information of hospitals.¹⁷

State/UT-wise Number of PHCs, CHCs, SDHs, DHs and beds in the Country.

State/UT/India	No. of Public facilities					No. of beds available in public facilities
	PHC	CHC	SDH	DH	Total	
All India	29,899	5,568	1,255	1,003	37,725	7,39,024

India, State/UT wise Number of Government Hospitals and Beds in Rural & Urban Areas

¹⁶ <https://hhbc.in/blog/healthcare-scenario-of-india/> (Last visited 19/08/2020)

¹⁷ As per the World Bank data available in the link '<https://data.worldbank.org/indicator/SH.MED.BEDS.ZS>', beds per 1000 Population in India are less than a number of countries. (Last visited 19/08/2020)

States/UTs	Rural hospitals		Urban hospitals		As on
	No.	Beds	No.	Beds	
INDIA	19810	279588	3772	431173	

State-Wise Distribution of AYUSH Hospitals and Beds as on 1-4-2017

Sr no.	State / UT	Number of Hospitals				Number of Beds			
		Govt.	Local Body	Others	Total	Govt.	Local Body	Others	Total
	TOTAL (A)	3694	35	164	3893	32476	2213	18337	53026
	B. CGHS & Central Government organization	50	0	0	50	2216	0	0	2216
	TOTAL (A+B)	3744	35	164	3943	34692	2213	18337	55242

Number of Hospitals and beds maintained by Ministry of Defence, State wise.

S. No.	Name of State	No. of Hospitals	No. of beds
	Total	133	34520

Number of Hospitals and beds in Railways (as on 21/03/2018)

S.No.	Zone / PU	Total No. of Hospitals	Total No. of Indoor Beds
26	Total	126	13748

Employees State Insurance Corporation Hospitals and beds (as on 31.03.2017)¹⁸

S. No.	States /UTs	Total No. of Hospital	Total No. of Beds
	Total	151	19765

Bio-Medical waste generated

Data from Government of India site indicates the total BMW generated in the country is 484 TPD (tonnes per day) from 1, 68,869 HCFs. Unfortunately, only 447 TPD is treated, and 37 TPD is left untreated. There are 198 CBMWTF in operation and 28 under construction. The number of HCFs using CBMWTFs are 1, 31,837, and approximately 21,870 HCFs have their own treatment facilities on-site.¹⁹

According to the CPCB annual report of 2016, total quantity of BMW generation in the country is approximately 517 tonnes per day (TPD). Besides, as per a joint report by Associated Chambers of Commerce and Industry of India (ASSOCHAM) and Velocity in 2018, the total quantity of medical waste generated in India is 550 TPD, and these figures are likely to increase close to 775.5 TPD by 2022. To grapple with these manifold increase in generation of BMW, 199 common bio-medical waste treatment facilities (CBWTFs) are in operation and 23 are under construction (CPCB, 2017).²⁰

¹⁸ <https://pib.gov.in/PressReleasePage.aspx?PRID=1539877> (Last visited 19/08/2020)

¹⁹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784295/> (Last visited 19/08/2020)

²⁰ <https://www.downtoearth.org.in/blog/health/biomedical-waste-management-in-india-still-a-looming-concern-63896> (Last visited 19/08/2020)

Management of Bio- Medical waste (Post COVID-19)

The wake of the COVID-19 pandemic, the Centre Pollution Control Board (“CPCB”) recently issued guidelines dated March 27, 2020 for handling, treatment and safe disposal of BM Waste generated during treatment, diagnosis and quarantine of patients confirmed or suspected to have COVID-19 (“**Guidelines**”). The Guidelines have been necessitated due to the super infectious nature of the Novel corona virus and provide for a mechanism for the segregation, packaging, transportation, storage and disposal of BM Waste in order to avoid further spread of the virus through BM Waste.²¹

Following specific guidelines for management of waste generated during diagnostics and treatment of COVID-19 suspected / confirmed patients, are required to be followed by all the stakeholders including isolation wards, quarantine centers, sample collection centers, laboratories, ULBs and common biomedical waste treatment and disposal facilities, in addition to existing practices under BMW Management Rules, 2016.

Using data from National Health Profile–2019, we observed that there are 7,13,986 total government hospital beds available in India. This amounts to 0.55 beds per 1000 population. The elderly population (aged 60 and above) is especially vulnerable, given more complications which are reported for patients in this age group. The availability of beds for elderly population in India is 5.18 beds per 1000 population.

We observe that many states lie below the national level figure (0.55 beds per 1000 population), these include Bihar, Jharkhand, Gujarat, Uttar Pradesh, Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Haryana, Maharashtra, Odisha, Assam and Manipur. These 12 states together account for close to 70% of the total population in India. Bihar has an acute shortage of government hospital beds with just 0.11 beds available per 1000 population. Some states do better on this metric such as West Bengal (2.25 government beds per 1000) and Sikkim (2.34 government beds per 1000). The capital city of Delhi has 1.05 beds per 1000 population and the southern states of Kerala (1.05 beds per 1000) and Tamil Nadu (1.1 beds per 1000) also have better availability of beds. The scenario is pretty similar when the analysis is done for just the elderly population: Northeastern states do far better than others; southern states also have higher number of beds available for elderly population — for example, Kerala (7.4), Tamil Nadu (7.8),

²¹ <https://www.mohfw.gov.in/pdf/63948609501585568987wastesguidelines.pdf> (Last visited 19/08/2020)

Karnataka (8.6) — while northern and central states have relatively low availability of government beds for elderly population.

The availability of government beds is abysmally low in India, and an epidemic like coronavirus can very quickly complicate the problem even further. An estimated 5-10% of total patients will require critical care in form of ventilator support. In a worst-case scenario, according to one estimate at least, we may end up with 2.2 million cases in India by May 15, which implies that we will need 110,000 to 220,000 ventilators. We have no official figures on the number of ventilators available in the public sector, however, we arrive at an estimated figure using the number of hospital beds available — 7,13,986 total government beds, out of which 5-8% are ICU beds (35,699 to 57,119 ICU beds). Assuming that 50% of these ICU beds have ventilators, we arrive at an estimate of 17,850 to 25,556 ventilators in the country. Even in the best-case scenario where all ICU beds are equipped with ventilators, we have a maximum of ~57k ventilators to cater to a growing number of COVID-19 patients. Clearly, the growing demand for ventilators is going to outstrip the limited supply really soon.²² Considering this the amount of biomedical waste generated during the time of pandemic it is impossible to say that the proper guidelines with regard to disposal is being followed.

Legislative Framework to Deal with the BMW

India's constitution guarantees free healthcare for all its citizens, but in practice, the private health care sector is responsible for the majority of healthcare in India, and most healthcare expenses are paid out of pocket by patients and their families, rather than through insurance. All government hospitals are required to provide healthcare free of cost.

When it comes to Bio-Medical waste, there are many legislation and rules has been established, implemented in this regard but satisfactory solution to the problem is still awaited. Nowadays Hospitals have become a source of commercialization as we all have been witnessed, whether it is private or public hospitals majority of them are least concerned about the health of people and the environment. There are lot of areas which need to be developed as per the need of contemporary scenario where diseases are spreading erroneously. Not even human beings but

²² <https://www.brookings.edu/blog/up-front/2020/03/24/is-indias-health-infrastructure-equipped-to-handle-an-epidemic/> (Last visited 19/08/2020)

animals too are suffering from the various known and unknown diseases, pollution and non-sanitation.

Protection of Environment is fundamental for our lives and wellbeing. The waste originated, manufactured or produced from the human activities not only reflects a genuine concern and cause a threat to nature and other complications. Ill management of waste created in medical services entities causes an immediate effect every day on the environment, large quantity of possibly irresistible and perilous waste are produced in the hospitals, labs and clinics etc. around the globe. Transfer of Bio-Medical Waste, improper disposal, handling etc., waste imposes a genuine risk on the environment. It requires explicit treatment and management preceding its end results.²³

National Framework for BMW

There has been various means and measures adopted by India in terms of dealing with the waste. However, there was no such legislation, which specifically deals with the Bio waste but in July 1998, first BMW rules were formed and notified by the Government of India, by the erstwhile Ministry of Environment and forest (hereinafter referred to as MOEF.) In India, BMW problem was further compounded because of the improper use of garbage and non-classifications of them as such by the presence of scavengers who sort out open, unprotected health-care waste with no gloves, masks, or shoes for recycling or to find an appropriate means for the disposal of reuse of syringe and other medical waste, without appropriate sterilization of them or to follow standard process in this regard.²⁴

The BMW 1998, Rules were modified several times in the following years – 2000, 2003, and 2011. The draft of BMW rules of the year 2011 has been remained as draft and it did not get notified because of dearth of consensus on categorization and standards.

During 2002 to 2004, the International Clinical Epidemiology Network²⁵ has explored the existing BMW practices, setup, and framework in primary, secondary, and tertiary health care facility (HCF) in India across 20 states. They found out that around 82% of the primary, 60% of secondary, and 54% of tertiary Health Care Facility in India had no credible BMW

²³ <https://www.nap.edu/read/1792/chapter/6> (Last visited 1/28/2020)

²⁴ <https://hspcb.gov.in/BMW%20Rules.pdf> (Last visited 1/28/2020)

²⁵ The International Clinical Epidemiology Network (INCLEN) was established in 1982 to strengthen the research capacity of medical schools in the developing world through the development of Clinical Epidemiology Units (CEUs). The role of these units is to promote a rational approach to clinical and health care decision making, drawing on the methods of clinical epidemiology, biostatistics, health economics and health social science.

management system²⁶ that has to be adopted or followed.²⁷ In the year 2009, around 240 people in the state of Gujarat, has affected due to hepatitis B, following reuse of unsterilized syringes. This and many more stances have taken place so far.

This demonstration that regardless of India being among the principal country to initiate measures for safe and secure disposal of BMW, there is an urgent need to take action for strengthening the existing system capacity, increase the funding and commitment toward safe disposal of BMW specially in government hospitals.

Afterwards, the Ministry of Environment, Forest and Climate change (MoEFCC) in the year 2016 have amended the BMW rules and implemented a new guideline.²⁸ These new rules not only have augmented the coverage but at the same time simplified the categorization and authorization while improving the segregation, handling, transportation and disposal methods to decrease environmental pollution. The new rules when made was stringent and elaborate enough and was focused on bringing about a change in the way, the BMW is being managed in India. Under the new rules of 2016, the coverage has increased to an extent where it include various health-care related camps such as vaccination camps, blood donation camps, and surgical camps.²⁹

Then, later on March 19, the government published in the e-gazette, another set of rules i.e. the Bio-Medical Waste Management (Amendment) Rules, 2019.³⁰ The crucial places of interest of the amended Rules were that the occupier of all bedded health care units, shall not only maintain but also update on a day to day basis the bio-medical waste management register. All bedded healthcare units shall display the monthly record of waste disposal management on its website and such health care facilities (irrespective of any number of beds), shall make the Annual Report available on its web-site before 19 March 2021, etc.³¹

Then again, considering current scenario, the year 2020 has kindled the BMW rules, 2020 on another level, several states has drafted a whole new guidelines due to worldwide pandemic. The Central Pollution Control Board of India for restricting the spread of pandemic, initiated novel and special guidelines, endeavours to ensure safe disposal of biomedical waste generated

²⁶ INCLEN Program Evaluation Network (IPEN) study group, New Delhi, India.

²⁷ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784295/> (Last Visited 1/28/2020)

²⁸ https://dhr.gov.in/sites/default/files/Bio-medical_Waste_Management_Rules_2016.pdf (Last visited 19/08/2020)

²⁹ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5784295/> (Last visited 19/08/2020)

³⁰ <http://egazette.nic.in/WriteReadData/2019/198301.pdf> (Last visited 19/08/2020)

³¹ <http://egazette.nic.in/WriteReadData/2019/198301.pdf> (Last visited 19/08/2020)

during handling, treatment, analysis, diagnosis and quarantine of patients with the novel Coronavirus disease (COVID-19). These guidelines on one hand provides series of steps for safe disposal of waste generated in hospital, isolation wards for COVID-19 patients, testing centres and laboratories, quarantine facilities and homes of suspected patients.³² This whole circumstance made us all think that, to what extent we have possessed the sanity to deal with the issues which was considered minor in nature before, Now it's high time for all the organization to not only strategize the handling but has to act according to the disposal guidelines.

Case Analyses

*B. L. Wadehra v. Union of India and Ors*³³, in this case the court said that the resident of Delhi have a salutatory right to live in a clean city and hence the Municipal Corporation of Delhi (MCD) and New Delhi Municipal Council (NDMC) are bind by statutory law to maintain and provide a city free from waste generated by the health care facilities. The main argument by the defendants were that the Danish company failed to provide them proper logistic for cleaning. The court went to an extend of saying that non availability of funds or insufficient machinery cannot be an excuse for non performance of their statutory obligations. Case is also important because it also lays down directives for collection, handling and disposal of bio medical waste. Thirdly it ask the authorities to promote awareness through mass media platform about their civic duties.³⁴

In *Maitree Sansad v. State of Orissa and Ors*³⁵, the court held that improper practices such as dumping of bio-medical waste in municipal dustbins, open spaces, water bodies etc., leads to the spread of diseases. Emissions from incinerators and open burning also leads to exposure to harmful-gases-which can cause cancer and respiratory diseases. Exposure to radioactive waste can in the waste stream can also cause serious health hazards. An often-ignored area is the increase of in-home healthcare activities. An increase in the number of diabetics who inject

³² https://tnpcb.gov.in/pdf_2020/BMW-GUIDELINES-COVID_Revised_April2020.pdf (Last visited 19/08/2020)

³³ AIR 1996 SC 2969.

³⁴ http://docs.manupatra.in/newslines/articles/Upload/D3D46A20-F27B-4868-BF59-DF2B971C096E.Bio-Medical%20Waste_Subornadeep%20Bhattacharjee_p33-44.pdf (Last visited 19/08/2020)

³⁵ 2007(Supp. 1) OLR 246

themselves with insulin, home nurses taking care of terminally ill patients etc., all generate bio-medical waste which can cause health hazards.

P. K. Nayyar & Ors. v. UOI & Ors³⁶, the question answered in this case is that, whether facility being run in collaboration with a private company of biomedical waste management is deemed near or far away from residential localities which are located at a distance of thirty to forty meters? The court held that, it is not in dispute that bio-medical waste is a hazardous waste which can be highly injurious to human life that precisely appeared to be reason for it being included in list of prohibited/negative list of industries. 30 meters or it is 40 meters could not be said to be a safe distance in sense that it was not unlikely to adversely affect health of residents of nearby complex and/or nearby habitats. In fact decision of Government of NCT of Delhi, which was a partner in concerned venture to shift it from present site was also an acknowledgement that being in close proximity of the residential colonies, facility was likely to cause damage to environment and adversely affect health of nearby residents - Further right to live in an environment free from pollution is a facet of fundamental right of life and liberty guaranteed under Article 21 of the Constitution.³⁷

Order of the Supreme Court of India in the matter of M. C. Mehta v. Union of India & Others dated 21/07/2020 regarding biomedical waste management.

The matter relates to dumping of biomedical waste in open areas in Delhi. It was pointed out, that biomedical waste of the corona patients was mixed with that of general patients and thrown in open. This could create havoc and thus its requisite treatment by incinerators and disposal was required. Under the Bio-Medical Waste (Management and Handling) Rules 2016, the individual hospitals can enter into a contract only with the State Pollution Board approved Common Bio-Medical Waste Treatment Facility (the Contractor) who collects the waste from the hospitals and manages the disposal of the waste.

The tracking of biomedical waste generated, collected, processed and recycled needs to be improved urgently by adopting the bar-code system, as specified in the 2016 Rules which has not yet been implemented completely. It was mentioned in the Environment Pollution (Prevention and Control) Authority (EPCA) report that one hospital in Meerut and two in Ghaziabad (Chhatrapati Shivaji Subharti Hosiptal, Paras Hospital and Lyf Hospital) had not adopted the bar code system.

³⁶ 198(2013) DLT 689

³⁷ https://shodhganga.inflibnet.ac.in/bitstream/10603/125223/11/11_chapter%204.pdf (Last visited 15/09/2020)

The SC directed that a meeting of the Central Pollution Control Board, Delhi Pollution Control Board and EPCA and the requisite stakeholders of the concerned departments of the Central Government and Delhi Government and National Capital Region, including the representatives of the corporations be called for urgently within three days and steps be taken with respect to clearing bio-medical waste of various hospitals and that of Corona patients. The SC said that notice be issued to the hospitals and asked to ensure that that bio-medical waste was not dumped in the open area and properly segregated and disposed of.³⁸

International Framework for Dealing with BMW

In the year 1989, The Basel Convention on the Control of “Transboundary Movements of Hazardous Wastes and their Disposal” was adopted usually known as the Basel Convention, as the name suggest it deals with the Transboundary movements of hazardous wastes and their disposal. The Basel Convention is relevant as it regulates the transboundary movements of hazardous waste and other related wastes under the umbrella of “prior informed consent” fundamentally depend on the standard of national or domestic legislation. To prevent and punish illegal traffic of hazardous waste and other wastes related thereof and to regulate the rules in this regard.³⁹

Aarhus Convention of the United Nations Economic Commission for Europe, 1998 the convention of United Nations Economic Commission provided an extensive dealing of the biomedical waste. This convention focuses on access to information, public participation in decision-making and aims at access to justice in environmental matters and rights of the people. The International Solid Waste Association (ISWA), it is an independent body, international and non-profit making association and that aims to promote, enhance and develop sustainable and professional waste management worldwide.⁴⁰ ISWA has constituted to protect human health and the environment as well as to ensure sustainable resource management and provides the following scientific, economic and social instruments. ⁴¹

Another effort in this area was of the Stockholm Convention, 2006 The Stockholm Convention on Persistent Organic Pollutants (POP), is a global treaty to protect human health and the

³⁸ <http://www.indiaenvironmentportal.org.in/content/468139/order-of-the-supreme-court-of-india-regarding-biomedical-waste-disposal-delhi-21072020/> (Last visited 15/09/2020)

³⁹ <http://www.ijmm.org/article.asp?issn=0255-0857;year=2017;volume=35;issue=2;spage=157;epage=164;aulast=Capoor#ref1> (Last visited 15/09/2020)

⁴⁰ <https://www.iswa.org/iswa/organisation/about-iswa/> (Last visited 15/09/2020)

⁴¹ Ensuring international fora recognise the importance of good waste management for health, economic, social and overall environmental progress towards a more sustainable society

environment from the POPs. These pollutants are polychlorinated dibenzo-p-dioxins and dibenzofurans, which are stable and have widely distributed, transferred and accumulate in the fatty tissue, these pollutants are toxic to humans life and as well as wildlife. It is essential to reduce or eliminate releases of POPs by incinerators and other combustion processes which is being used for the waste treatment, through best available techniques specified as Best available practices (BAT) guidelines. The BAT guidelines for BMW incinerators and wastewater require to achieve low air emission levels of dioxins and furans. It also aims that, the alternative technologies that need to be adopted to tackle with BMW. That promotes the best environmental practices known as (BEP).⁴² BEP includes training, collection, transport, source reduction, segregation, resource recovery and recycling, for new incinerators within the period of 4 years.⁴³

In a WHO meeting held in Geneva, in June 2007, the WHO policy paper provided a list of suggestions that government organisations should adopt for the purpose of recycling, polyvinyl chloride (PVC)-free medical devices, risk assessment and sustainable technologies to promote environmentally sound management of BMW.⁴⁴ Some core principles for achieving safe, healthy and sustainable management of health-care waste were developed and discussed. The first edition of the handbook by the WHO which was on safe management of wastes from health-care activities also known as “The Blue Book” was came out in the year 1999. Consequently, the second edition of the same “The Blue Book” was published in the year 2014. It has provided newer methods for safe disposal of BMW, nuances and new environmental pollution control measures, and detection techniques associated with it.⁴⁵

5. Conclusion

The government must take measures to ensure that the hospitals not only provide cost effective treatment but also provide better care and facilities for the waste also. In one study conducted

⁴² Stockholm Convention on Persistent Organic Pollutants 2006, Secretariat of the Stockholm Convention. Revised Draft Guidelines on Best Available Techniques and Provisional Guidance on Best Environmental Practices of the Stockholm Convention on Persistent Organic Pollutants. Geneva: Secretariat of the Stockholm Convention; 2006.

⁴³ WHO, core principles for achieving safe and sustainable management of health-care waste WHO (2007a). Geneva: World Health Organization; 2007
http://www.who.int/water_sanitation_health/medicalwaste/hcwprinciples/en/index.html (Last visited 15/09/2020)

⁴⁴ ibid

⁴⁵ <https://apps.who.int/iris/bitstream/handle/10665/259491/WHO-FWC-WSH-17.05-eng.pdf> (Last visited 15/09/2020)

by the industry body ASSOCHAM and Velocity has submitted its view as “India is prospectively generates near about 775.5 tonnes of the medical waste per day. These estimated in about to increase more by the year 2022 from the current level of 550.9 tonnes on a daily basis.⁴⁶ Therefore, like any other environmental issues this area which is not highly talked about should be discussed more and the conditions of the hospitals has to improve. Another study of medical waste is to be expected to nurture more at a compounded annual growth rate (CAGR) of about 7 per cent as reported in the study titled as “Unearthing the Growth Curve and Necessities of Bio Medical Waste Management in India-2018”, this study stressed on the need for strong participation by the government and people collaboratively.

We all are aware that unregulated, unprotected BMW is a public health problem that has to be dealt with suitable protection and care. The problem of waste has posed a grave hazard to not only to the environment but to all the natural resources. The current pandemic Covid-19 has led to another novel level of concern altogether, where appropriate disposal is not merely a procedure to follow with but a threat, for numerous reasons built under it.

To combat with these issues, well equipped and reliable methods for handling of BMW, knowledge in this regard should be given paramount importance. The thing one should be aware of that effective BMW is not only a legal necessity but also a social responsibility. Based on the current conditions of BMW, compliance of rules and regulations provided by the legislature should be adhered and followed strictly by all the entities. Various measures that International community adopts on national and international level, including ideas discussed in the conventions, follow up of the standards set by the conferences and treatment technologies used should be implemented as per the convenience, enhancement and development which has already taken place in foreign countries, as per the convenience India should also adopt the same.

BMW should ideally be the subject of a national strategy, policy with dedicated infrastructure, procedure from and with cradle-to-grave legislation. Competent regulatory authority has to make sure of these requirements and trained the concerned personnel accordingly. Improving the BMW should be a shared teamwork with committed government backing, good BMW practices followed by both health-care workers and Health care facility (HCFs), continuous monitoring of BMW practices, and strong legislature. Not to mention that it is our fundamental

⁴⁶ <https://swachhindia.ndtv.com/india-likely-to-generate-775-5-tonnes-of-medical-waste-daily-by-2020-study-18430/> (Last visited 15/09/2020)

right to live in clean and safe environment. All participants in BMW should pledge to guarantee a cleaner and greener environment and should make all endeavours to do so.

This interim guidance supplements the infection prevention and control (IPC) documents by summarizing WHO guidance on water, sanitation, hygiene (WASH) and waste management relevant to viruses, including coronaviruses. This document is an update to the interim guidance document entitled ‘Water, sanitation, hygiene, and waste management for the COVID-19 virus’, published on 23 March 2020. It is intended for water and sanitation practitioners and providers, and health-care providers who want to know more about WASH and waste risks and practices in relation to COVID19. The provision of safe water, sanitation and waste management and hygienic conditions is essential for preventing and for protecting human health during all infectious disease outbreaks, including of coronavirus disease 2019 (COVID-19). Ensuring evidenced-based and consistently applied WASH and waste management practices in communities, homes, schools, marketplaces, and healthcare facilities will help prevent human-to-human transmission of pathogens including SARS-CoV-2, the virus that causes COVID-19. This guidance was originally published in March 2020. This third edition provides additional details on risks associated with excreta and untreated sewage, hand hygiene, protecting WASH workers and supporting the continuation and strengthening of WASH services, especially in underserved areas. This additional information has been prepared in response to questions that the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) have received about the prevention and control of COVID19 in settings where WASH services are limited.⁴⁷

Suggestions for the Management of BMW

Other biomedical waste ought to be isolated into either a plastic pack or unbending holder with a well-fitted cover and named biomedical waste and has to be treated with proper guidelines. All biomedical waste compartments ought to be shading coded in red or yellow and obviously set apart as containing biomedical waste. All biomedical waste can be stored in an assigned biomedical waste stockpiling zone to escape from the mishap. Human anatomical and creature anatomical waste ought to be put away at a temperature at or underneath 4 degrees Celsius. Households are urged to put biomedical waste in inflexible and cut safe watertight compartments, suitable edification with regard to handing of bio-medical waste for household

⁴⁷ <https://www.who.int/publications/i/item/water-sanitation-hygiene-and-waste-management-for-covid-19> (Last visited 15/09/2020)

are necessary. Containers ought to be taken to the nearest wellbeing focus when full. Prior to transportation biomedical waste stockpiling compartments ought to be bolted or shut with the end goal that biomedical waste is not discharged or released during transportation whether inside or outside the office. The waste has to be parted from other domestic waste and such has to be dispose-off separately.

Apart from the measures that has been taken by the government with regard to safety, disposal, handling and management of the Bio medical waste, there is already lot many areas that to be worked on with regard to standards, policy and stringent regulation. The medicinal services providers can maintain a strategic distance from most restorative waste issues by holding fast to a couple of key prescribed procedures and following those consistently.

Representatives or the concerned should be well versed with the laws, rules and the policies, and that has to be characterize and updated accordingly. An isolated department should be dedicated to maintain all these standards. The wastes have to be managed systematically, all waste by type into the right, shading coded waste holders. Waste ought to be marked relying upon its class, and the correct documentation ought to go with all compartments during travel specially. A trustworthy medical waste transfer organization can enable an office either can be public or private, to give these accepted procedures a direction and has to be accountable for the requirements of the waste disposal in a proper manner and has to follow the medical waste laws and procedures related thereof. It's a fundamental requirements and all the relative organization have to be aware of the rules from every organization that they follow, we have been noticing various alterations which has occurred due to Covid-19, we require more circumspection while getting ready, moving, transferring and discarding the bio-medical waste, hazardous waste and group restorative waste effectively. Recognizing the sort of waste one is handling in the initial phase and planning it accordingly would make the process run smoothly, it would result in appropriate disposal of discarded material.

If the organization involved would separate the waste by type, yet it again will lead to smooth the functioning. Waste ought to be isolated out into the various classes, including sharps, pharmaceutical, compound, obsessive, non-hazardous and any other criteria of these. Managed bio-medical waste goes in red packs. Sharps that go into these packs must be placed into cut confirmation compartments first and has to be named properly and shall be handled with due care.

Utilize the correct restorative waste holders and other related tools to make sure that nothing spills. Put all waste in affirmed compartments relying upon how it's characterized and should be carried. Some waste can go in ensured cardboard boxes, while other waste gets put in unique tubs or even bolted up for travel with all the precautionary measures. Such as setting up the compartments appropriately and accordingly. Human services waste compartments and sacks must be taped for shipment, duly named, at that point of travelling or shipment bundled by limitations gave by the law. Compartments ought to be put away in a protected, dry zone before pickup or delivery. It's basic to appropriately mark all waste before ship also and check the security standards then and there.

Incorporate the correct documentation is also really important. It is necessary that there has to be list with the specified objects and there use and misuses. Appropriate documentation of insurance is pivotal to secure both the supplier and the waste transfer organization. The correct desk work of requirements ought to go with every compartment and pack all through the prescribed procedure. Utilize the bio-medical waste transfer shading code, symbols or with appropriate marks if any. The shading coding framework for waste isolation requires all sharps to go in cut safe red biohazard compartments. It has to be carried with that amount of care and precautions. Biohazard waste goes in red sacks and compartments. Yellow holders are for follow chemo waste, while pharmaceutical waste goes into dark compartments for hazardous materials and blue for all others. Radioactive wastes like Fluorine-18 or Iodine-131 get put in protected holders set apart with the radioactive image and has to be suitably managed⁴⁸. Contract the appropriate waste transfer organization or built one inside the organization to specifically deal with these sort of standards prescribed the government and some other which organization themselves should make one and follow the same. Some other safety criteria for the people who all are involved in these activities has to be made and to be followed. Numerous directing bodies which exposed to different dangers, and a few various types of waste present which can affect the health or have an overwhelming impact, a test for medicinal services workers should be there too. At times it is important to collaborate with the independent contractor for the secure disposal, banding together with a dependable merchant is could be beneficial and less hectic for the hospitals.

⁴⁸ <https://pubmed.ncbi.nlm.nih.gov/8790195/> (Last visited 18/01/21)