

Common Health Hazards in Healthcare Facilities & Impact on Healthcare Workers/Professionals/patients – Remedial Measures – An analysis

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Abstract

Globally in any healthcare facility there are numerous healthcare hazards such as Infectious diseases, Occupational diseases are common and affecting not only healthcare workers, professionals and such other healthcare workforce attending patients but also patients and their accomplice. While providing healthcare services i.e. preventive, curative and rehabilitative to the patients who visit the healthcare facilities for their ailments / discomfort in some unavailable circumstances the healthcare personnel (healthcare workforce, professionals etc) face healthcare hazards. Unlike other service oriented organizations where one can choose any service that the consumer wants on their own but where as in healthcare it is case specific and the customer namely the patient has to go to a specific place (healthcare facility) and to a specific professional who is capable of extending that particular service needed by the patient. Hence, the healthcare providers and the healthcare professionals should be very careful in handling / treating the needy patients and at the same time to protect themselves from the healthcare hazards and the communicable diseases that are common in any healthcare facility. Though much development took place in medical science/medical technology, procedures and the present system of medical modern technology has made healthcare very complex with many hazards. The main healthcare hazards that are common in any healthcare facility are Biological hazards (viruses, bacteria and parasites), Chemical hazards (disinfectants, drugs and diagnostics), Physical hazards, Ergonomic hazards, Occupational hazards, Occupational exposure to Vancomycin, BRSA Infections, Radiation effect, Violence, Exposure to reproductive health hazard, Stress disorders etc. In this article an attempt is made to discuss about various healthcare hazards that are commonly prevalent in the healthcare facilities in addition to occupational diseases and infectious diseases causing innumerable damage and hardship not only to the workforce and professionals and to the patients in form of other but mainly through transmission and improperly used equipment and maintaining the healthcare facilities in improper environment. Due to increased work load because of human immune deficiency virus, hardships of increased. Also the preventive measures and necessary infrastructure to combat such hazards and infectious diseases, as per the guidelines of the World

Health Organization the steps that are to be taken in this regard by the healthcare facility providers are also discussed threadbare.

The Constitution of India though does not expressly guarantee a fundamental right to health, there are multiple references in the Constitution to the public health and the role of the state, the provision of healthcare to others. In India this right which is a natural corollary to promoting public health is protected under the Constitution of India in multiple ways.

Keywords: Healthcare hazards, Biological hazards, Chemical hazards, Physical hazards, Ergonomic hazards, Occupational exposure to Vancomycin, BRSA Infections, Radiation effect, Violence, Exposure to reproductive health hazard, stress disorders, Corporate Social Responsibility (CSR).

Introduction:

According to World Health Organization (WHO),

“Health is a state of complete physical, mental and social well being and not merely the absence of disease. The WHO goes on to clarify that it is the state’s legal obligation to ensure uniform access to, timely, acceptable and affordable healthcare of appropriate quality as well as to provide but the underlying determinants of health, such as safe and potable water, sanitation, food, housing, health related information in education, and gender equality, to all people”.

In India this right, which is a natural corollary to promoting public health, is protected under the Constitution of India in multiple ways.

The Constitution of India does not expressly guarantee a fundamental right to help; however there are multiple references in the Constitution to Public Health and the role of the state, the provision of healthcare to citizens.

In any healthcare facility there are numerous healthcare hazards that come across, while working in healthcare facilities; these hazards will cause serious health problems not only to the healthcare workers and professionals but also the patients and the visitors and the people in and around the facility, if the hazards are not identified, contained if not totally eliminated. The misnomer in the public mind that *“when working in healthcare facility, it is healthy and safe place to work. Surprisingly working healthcare settings, whether in hospital, nursing home, home of seniors, group homes are in the community providing care in clients homes is as hazardous as working in other environments”.*

Some of the healthcare hazards are, (a) Biological hazards, (b) Chemical hazards, (c) Physical hazards, (d) Ergonomic hazards, (e) Occupational exposure to Vancomycin, BRSA Infections, (f) Radiation effect, (g) Violence, (h) Exposure to reproductive health hazard, stress disorders etc., are some of the major hazards in an healthcare facility and to Healthcare Workers, Professionals, Patients and others.

Some of these hazards, if they are not properly contained and handled if not eliminated, the healthcare workers, personnel’s, professionals will become the victims of the effects of hazards. Healthcare facility

is predominantly human service oriented, comprising of workers, Healthcare Professionals, nurses, technicians, laboratory workers, social workers, respondents at various levels, maintenance, security, administration, foodservice, housekeeping, mortuary will be the victims of these health hazards. Healthcare Personnel refers to all the work force working in an healthcare facility who have the potential exposure to patients and/are to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces or contaminated air. The hazards also include blood born pathogens (biological), drugs, anesthetic gases, laser, work violence, and people associated with laboratories, radioactive material, X-Ray waste, lifting and repetitive to tasks. In this article an attempt is made to enlighten the different types of hazards of any form in the healthcare facility that are prone to human force of all categories employed in the healthcare facility in addition to patients and their accomplice, how patients and the visitors, unless a thorough planning and implementation of eradicating or minimizing the effect of these hazards, and the mandatory legal obligations of the healthcare providers to strictly observe the conditions stipulated and failure to do so. The punishment, in terms of fines, day recognition of healthcare facilities, cancellation of registrations of the facilities and the healthcare professionals, in addition to, the provider's obligation to the public at large and the protection of environmental pollution surrounding the healthcare facility are also examined and discussed. In addition the Corporate Social Responsibility (CSR) is also discussed whether the facilities are discharging their CSR and if so to what extent.

Health hazards in healthcare facilities to the healthcare personnel is a burning problem all over the Globe, inspite of World Health Organizations recommendations, the respective State and Central Governments directives, the results are not up to the mark. The Covid – 19 pandemic and the subsequent variants that has shaken the healthcare sector Universally, brought these lacunas in majority of the healthcare facilities in and around the Globe including the advanced and developed countries. There is a saying that,

“Prevention is better than cure”

I. What is a Hazard?

A hazard is something like an element/situation/environment that has the potential to cause harm or damage or to have an adverse effect to a person/persons. Normally people will always confuse themselves the difference between hazard and risk, especially when it is related to **“occupational health and safety”**. The risk or level of risk is determined by the likelihood of a person may be harmed or experience an adverse effect, if the persons are exposed to a hazard or hazardous situation; it means an hazard will have a negative impact on an individual's health and safety. The sources of these health hazards can be categorized to a, substance, material, process and practice that can cause harm.

II. Most common safety and health hazards

1. Biological hazards:

Normally biological hazards are referred to as Bio Hazards, that means any biological or organic substance that have the potential to cause harm or pose a threat to human health. Some of the examples of Biological Hazards are, when persons are exposed to animals while working, exposed to infected plants, these

biological hazards will cause adverse health effects and at times result in death. The Biological Hazards can be transmitted in number of ways including, injection, absorption, ingestion or inhalation. These Biological Hazards are found in the variety of work places including healthcare facilities, laboratories, in schools, care homes, farms and food processing industries.

a. Some of the situations where in an individual can be exposed to Biological Hazards. When they contact with any of the following:

1. Blood and other body fluids
2. Medical/Healthcare process waste
3. Fungi Moulds and Yeasts
4. Bacteria and Viruses
5. Animal and Bird droppings
6. Environmental specimens such as plants and soil
7. Biological toxins and Venoms
8. Insect bites
9. Hospital waste
10. Healthcare waste (solid like disposal injections, medicinal bottles, cotton, glass and such other surgical waste).
11. Affiliate coming from the healthcare facilities (untreated)
12. Healthcare waste sewage etc.,

These Biological Hazards can be grouped into four depending upon the level of infection/risk that they cause to the humans and in the group one having the lowest effect and the group four having the highest effect.

2. Chemical hazards:

Chemical hazards that cause health hazard can be in the form of Solid, Liquid or Gaseous and of these, some are most harmful, some are less harmful. However these Chemical Hazards are the substances that cause hazards or will affect the health of any person from disability to irritation, breathing problems, respiratory system, irritation and sometimes blindness. Though Chemical Hazards are most common in many of the working places but in the healthcare facility they have serious effects because of the nature of chemicals that are being used.

Hazardous Chemicals are classified according to the effect they cause such as Harmful, Toxic, Very Toxic, Corrosive, Flammable, Extremely Flammable, Oxidizing Agents and Explosives.

3. Physical hazards:

Normally Physical Hazards are neither seen nor touched but one can feel the effect of it. That means the factors and conditions of that particular situation/environment that causes harm to a person.

a. In the healthcare facilities some of the physical hazards are,

1. Height (roof height of various working places where movement is restricted causing harm)
2. Loud noises – if the noise is too much around the inpatient wards it will have bad impact and effect on patients' health. Hence noise pollution should be strictly followed, else, not only the patient but also health care professionals will also be effected and distracted from their normal course of action; it creates communication problems.
3. Exposure to sunlight or ultraviolet rays: In healthcare facility where the laboratories or testing facilities are having this ultraviolet ray which are used for healthcare purposes should be full proof and should not cause harm to the healthcare professionals and patients. Maintenance of temperatures in ICUs and Operation Theatres.

The controlling of the temperature is most important in ICUs, CCUs and Neonatal Baby Care Units, Operation Theatres etc., should be maintained to the extent that is required; else excess/less temperature will have adverse effect on healthcare professionals/workers and patients (Alternative Power System in case of emergency in electrical failures should be established).

4. Body stressing from repetitive or strenuous work : Healthcare workers/professionals and other healthcare personnel who are working in the healthcare facilities should not be exposed or tasked with heavy work that is not recommended under any circumstances; if so it will have an adverse impact on their handling of the work/procedure which will ultimately affect the patient's health.

5. Confined spaces, Poor Ventilation and Contamination: While designing a healthcare facility, the designer/architecture should have full information regarding the utility and purpose of that particular Facility and the ultimate outcome should be kept in mind and collect such information from healthcare providers; because in healthcare facility each area/room/space is utilized for a specific purpose/movement/rest, and such particular environment should be created, while designing a facility.

6. Electrical appliances/Power Systems/Alternative Power system: These are the most important aspects especially in Operation theaters ICUs, CCUs and Neo-Natal-ICUs where Premature Babies are kept. There are many incidents wherein, in the Neo-Natal Care Units where premature babies are kept under particular temperature, light and environment, improper installations and breakdowns, fires occurred and many infants lost their lives.

7. Vibrations/Slippery: Another important aspect of physical hazard is patients falling in the bathrooms causing physical disabilities and at times even loss of life unconnected with their health problems but because of the physical environment in the healthcare facilities. Hence, the floors of the rooms of the patients, wall paintings, proper room sanitation, non slippery floorings etc., are to be taken into account, else they will cause more harm to the patients, because of their restricted movement condition due to their ailments/discomforts.

4. Ergonomic Hazards:

Ergonomic Hazards are physical conditions that may pose a risk of injury to the musculoskeletal system. Ergonomic Hazards include awkward postures, static postures, high postures, repetitive motion, or short intervals between activities. The risk of injury is often magnified when multiple factors are present (Wikipedia)

Ergonomic Hazards in healthcare facility are depends mainly on

- a. Healthcare facility design
- b. Availability of equipment for the use of the professionals, patients and paramedics and their positioning.
- c. Movement of material, equipment and patients in a proper posture.
- d. Ventilation/illumination in ICUs and Operation Theatres to minimize Ergonomic Hazards to the professionals who are attending healthcare procedures etc.

In the new era of healthcare facility design, the Architecture/Designers should keep in mind while designing the facilities all the above factors into consideration. In addition to make use of the space available to its maximum and to get maximum output with less or no strain to the professionals mainly who are working in such environments to control Ergonomic Hazards. One of the best way of reducing Ergonomic Hazards in Healthcare Facility is to apply Scientific Management Tools by identifying the Time Study, Motion Study and Method Study of the professionals, equipment and the motion of the patient so that those Healthcare Facility Environments are not subjected to Ergonomic Hazards.

5. Occupational Hazards:

Health workers face a range of Occupational Risks associated with infections, unsafe patient handling, hazardous chemicals, radiation, heat and noise, psychological hazards, violence and harassment, injuries, inadequate provision of safe water, sanitation and hygiene (World Health Organization).

Normally occupational hazards in healthcare facilities include accidents, radiation, exposure to noxious chemicals, drug addiction and physic problems and assaults.

a. Occupational Infections: The most common occupational infections in an healthcare facility, concerned with healthcare professionals and workers are Tuberculosis, Hepatitis B and C, HIV/AIDS and Respiratory Infections such as Influenza and the present Pandemic of Covid-19 and its Variants.

b. Unsafe Patient handling: The other occupational hazard is unsafe handling of the patients, such as lifting, transferring, repositioning and moving patients without using proper techniques or handling equipment can cause musculo skeletal injury (Back Injury and Chronic Back pain)

c. Exposure to hazardous chemicals: The most common hazardous chemicals in the healthcare facility include, cleaning and disinfecting agents, sterilents, mercury, toxic drugs, pesticides, latex and laboratory chemicals and reagents.

d. Effect of Radiation (Exposure to Radiation): Ionizing (X-Rays, Radionuclides) and non ionizing radiation (UV Lasers), exposure may occur in healthcare settings and pose specific risks to the health and safety of healthcare professionals.

e. Occupational stress, burnout and fatigue: Pressure of time, lack of control over work tasks, long working hours, shift work, lack of support and moral injury are important risk factors for occupational stress, burnout and fatigue among healthcare professionals. The present Covid-19 pandemic is a result of burnout, fatigue and stress of the healthcare professionals who worked day in and day out in the peak.

f. Violence and harassment: In spite of the best efforts to mitigate the suffering of the patient's by the healthcare professionals in odd working hours and in emergency situations still the professionals are being abused, if something goes wrong and is called work related abuse, and becomes fatal at times if the violence is uncontrollable (Mob Hysteria if the patients acts of violence against professionals)

g. Threats or assaults: Among healthcare force, themselves indulging in physical, sexual, verbal and psychological abuse and workplace harassment. In addition at times the relatives/accomplice of the patient are assaulting the healthcare professionals if anything goes wrong. Especially in the case of drug addicts and patient with mental disorders the professionals will always face abuse and violence and sometimes leads to irreparable loss / injury / death to the healthcare professionals.

h. Risks in ambient work environment: These are work related factors in healthcare facilities such as thermal discomfort (heat or cold stress) and noise, that may cause harm to healthcare professionals.

i. Occupational Injuries: Common Injuries such as slips, trips and falls, road traffic injuries (ambulance crashes, motor bike and bicycle injuries), electric shocks, explosions and fire.

j. Environmental health hazards: Unsafe and insufficient drinking water and for washing, inadequate sanitation and hygiene, hazardous healthcare waste and climate related risks may cause work related diseases and injuries.

6. Exposure to Reproductive Health Hazards:

After the invention of Reproductive system, of-late, it was observed that it was not only the possible effects on the fetus but also reproductive health in general. Later studies found that reproductive toxins may also induce hormonal imbalance which might affect other aspects of reproductive health such as menstruations, ovulation, fertility and quality life. That is why presently attention is being drawn towards the pregnant women and the foetus, to the entire spectrum of health hazards in the reproductive system of both genders. The effects of Reproductive hazards include infertility, miscarriage and both defects; in addition

development of disorders in the children. Reproductive health hazards are caused due to lead (Chemical) radiation (physical) and viruses (biological). Workers may be exposed to reproductive hazards by inhalation or by contact with skin and by swallowing also.

7. Stress disorders in Healthcare:

Acute stress disorder is one of the most frequent mental illness occurring during emergency situations. This condition namely acute stress disorder is noticed in covid-19 pandemic situation that has erupted globally like a Volcano. If these stress disorders among healthcare professionals and workers are left unresolved, will result in various disorders and in extreme circumstances they become fatal. Burnout syndrome of emotional exhaustion, depersonalization towards patients, and reduced sense of personal accomplishment are not uncommon. There are various forms of stress disorders and they are mainly dependent on the environment in which the healthcare professionals and workforce are put in, the environmental conditions, emergency situations, lack of amenities, lack of trained personnel and material including medicines in emergency situations are some of the causes for this stress disorders on the healthcare professionals and the workforce. These things are noticed during covid-19 pandemic such as lack of beds, lack of oxygen, PPT kits, masks have exposed how this healthcare professionals and workers are succumbed to such stress disorders.

8. Health and Safety Hazards:

As mentioned above, any hazard is something that has the potential to cause harm, damage or adverse effect on a person's health or persons who are working in such environment. That means in healthcare, a hazard whatever may be the type that causes harm or adverse effect if safety norms are not taken into consideration; it means a hazard will have negative impact on an individual's health and safety when exposed to.

III. Following are some of the safety concerns in Healthcare:

a. A Study conducted in this regard revealed that **"Healthcare Facility Errors"** are the third leading cause of death in general, where patient safety is of prime importance in healthcare facilities, and to reduce healthcare hazards. The healthcare professionals/workers should know the mistakes/errors committed during procedures/care taking.

i. Medication errors: Medication errors are also the cause of harm/hazard to a patient if the healthcare professional / workforce, administers a wrong drug, wrong dosage and combination of drugs that interact poorly. If these mistakes happen, by whatever way it will have adverse impact on the health of the patient and is also a kind of health hazard due to human error.

ii. Diagnostic Errors: Normally diagnostic errors occur when an healthcare professional /lab technician makes a mistake such as, wrong diagnosis, missed diagnosis, delayed diagnosis, no diagnosis, failure to recognize complication, failure to diagnose a related disease, failure to diagnose unrelated disease causes harm to the patients health.

iii. Discharge errors: When a patient undergoes procedure/treatment for the ailment/discomfort in any healthcare facility it is the responsibility of the professionals/provider/care giver at the time of discharge the patient should be provided with necessary inputs and care to be taken, once they leave the healthcare facility. In this regard, the professional should be careful enough not to provide too much information or less information to the patient for after care, else things will go wrong.

iv. Workplace safety: If the healthcare facility is not properly designed and equipped with the necessary facilities, possibility of injury to the patient, professionals and the workforce and even to the visitors will cause more harm. In addition if proper care is not taken in the facility the risk of infection and life threatening environment will occur causing damage / harm not only to professionals but also to the patients and visitors. Hence, occupational safety and health administration is one of the most important aspects in any healthcare facility to reduce healthcare facility hazards and injuries. There are many studies that focused on occupational safety and administration, proved that, it is major concern in any healthcare facility causing irreparable loss and sometimes these losses are retrievable.

IV. The most common Occupational Diseases:

a. What is most common Occupational Diseases

The Covid-19 Pandemic that caused havoc globally has opened the Ponderous box regarding Occupational Diseases and Infectious Diseases that have affected healthcare workers, Professionals, Patients and Community at large.

“Occupational Diseases are conditions or disorders that result for the nature of your work. An Occupational Disease is one that is caused by work environment or activities that are part of your occupation”.

The Canadian Centre for Occupational Health and Safety (CCOHS) states that,

“In general, Health conditions or disorders that occur among a group of people with similar occupational exposures at higher frequency than the rest of the population are considered to be occupational diseases”.

b. The most common Occupational diseases are

1. Dermatitis: According to the National Institute for Occupational Health and Safety (NIOSH), the ILO (International Labour Organisation), The European Agency for Safety and Health Work,

“The most important cause of occupational skin diseases, and account for 15 to 20 percent of all reported occupational diseases in the U.S, dermatitis is caused by a wide array of physical, biological or chemical agents.”

According to NIOSH 75 percent of patients with occupational contact dermatitis end up developing chronic skin diseases.

2. Respiratory Illness: Respiratory Illnesses include Asthma, disease of the lung and Chronic Obstructive Pulmonary Diseases. Asthma is considered to be the most common occupational living disease. According to OHCOW, there are over 300 chemicals in the work place that are known to cause Asthma and is more prevalent in non-healthcare sectors but had its impact on healthcare sector also.

3. Musculoskeletal Disorder: Already mentioned above

4. Cancer: The European Agency for Safety and Health at Work states that, Cancer accounts for 24 percent of global work related deaths. In cancer, that includes Lung cancer, Gastrointestinal Cancer, Cancer of the Larynx are Pharynx and Mesophelioma (A Cancer which occurs in the thin layer of tissue covering most internal organs).

5. Stress and Mental Health Disorders: Already explained above.

6. Infectious Diseases: NIOSH mentions that, Healthcare Workers, run the risk of contracting infectious diseases such as Tuberculosis, Hepatitis B & C, Human Immuno Deficiency Virus (HIV) and at times Tuberculosis etc.

V. Infection Control Mechanism in Healthcare Settings:

In any healthcare facility, an Healthcare Worker is the primary source of transmission of Infectious Diseases. As the Healthcare Workers are exposed to infections and they are not only at the risk of acquiring infections but also a primary source of transmission of infection to patients. Hence, it is the responsibility of the healthcare facility providers to protect both the patient and healthcare worker from contracting or transmitting healthcare facility acquired infections by adopting recommended infection control measures.

a. The infection control committee and the occupational health services of the Healthcare facility should focus on, personal hygiene, monitoring of carriage of specific micro organisms, monitoring of infectious disease outbreaks, identification of infection risks and planning of preventive measures in such situations.

b. This prevention of **“Infectious Disease Control Mechanism”** will serve three purposes such as

i. Health of the Healthcare workers

ii. Prevention of work restrictions

iii. Minimizing, if not eliminating hospital acquired infections

iv. The important aspect of improving compliance with the guidelines of infection control/prevention measures are educating the work force. The work force should be taught about the risk of infection and the root of transmission of pathogens. They should be taught regarding hand hygiene and the standard precautions prescribed in preventing transmission of infectious diseases to patients whom they are attending.

v. The other aspect of protecting healthcare workers from specific infectious agents is by immunization.

vi. The Committee should always assess the situations of the patients with the signs of symptoms of infectious transmission diseases by taking appropriate measures such as isolation etc., to prevent the spread of infectious diseases from one to other.

VI. The World Health Organization defined disinfection guidelines under five procedures.

a. Hand-Disinfection:

1. Before touching a patient
2. Before clean/aspect procedure
3. After body fluid exposure risk
4. After touching a patient
5. After touching patient surroundings

b. Patient Safety: According to WHO, in any Healthcare Facility, Patient Safety is a fundamental to delivering quality essential health services. It means, Quality Health Services across the world should be effective, safe and people centered and must be timely, equitable, integrated and efficient in controlling infectious diseases or disinfection.

Safety of the patient when they are in the facility for any health services, the services should be safe and of high quality and free from all healthcare hazards/infectious diseases.

c. The World Health Organization identified a patient safety burden that poses a major and significant risk. The challenges are,

1. Clean care is safer care (2005); with this goal, reducing healthcare associated infection, by focusing on improved hand hygiene
2. Safe surgery saves lives (2008); dedicated to reducing risks associated with surgery.
3. Medication without harm (2015); with the aim of reducing the level of service, avoidable harm related to medications globally by 50 percent over five years.

d. Unsafe Transfusion Practices: This practice expose patients to the risk of adverse transfusion reactions and the transmission of infections.

e. Radiation errors: This involves over exposure to radiation and cases of wrong patient and wrong site identification.

f. Unsafe Injection Practices: It is not uncommon to notice that in any Healthcare facility transmission of infections with unsafe injections including HIV and Hepitite B & C and pose direct danger to patients and Healthcare workers as well.

g. Unsafe Surgical care Procedures: This kind of health procedure causes complications and millions of surgical patients world over suffer significant complications.

h. Healthcare Associated infections: It is estimated that 7 to 10 out of 100 Hospitalized patients are affected with healthcare associated infections.

VII. Healthcare Waste from Healthcare Facilities:

According to WHO, of the total amount of Waste generated from the Healthcare facilities by healthcare activities, 85% is general, non hazardous but the remaining 15% is considered hazardous material that may be infectious and include chemicals and radioactive substances.

a. Types of Waste:

World Health Organization has classified healthcare waste

1. Infectious Waste: Waste contaminated with blood and other body fluids (discarded diagnostic samples), cultures and stocks of infectious agents from laboratory/testing facilities (Waste from autopsys, and infected animals from laboratories) or waste from patients with infections (Swabs, bandages and disposable medical devices)

2. Pathological Waste: Human Tissues, organs or fluids, body parts and contaminated animal carcasses

3. Sharp Waste: Syringes, needles, disposable scalpels

4. Chemical Waste: Solvents and reagents used for laboratory preparations, disinfectants, sterilants and heavy metals contained in medical devices (Mercury in broken thermometers) and batteries.

5. Pharmaceutical Waste: Expired, unused and contaminated drugs and vaccines,

6. Cytotoxic waste: Waste containing substances with genotoxic properties (highly hazardous substances that are, mutagenic, teratogenic or carcinogenic) such as cytotoxic drugs used in cancer treatment and their metabolites

7. Radioactive Waste: Radioactive waste such as products contaminated by radionuclide's including radioactive diagnostic material or radio therapeutic materials and finally,

8. Non hazardous or general waste: Waste that does not pose any particular, biological, chemical, radioactive or physical hazards.

The major source of healthcare waste are, from, Healthcare Facilities, Laboratories and Research Centres, Mortuary and Autopsy Centres, Annual Research and Testing Laboratories, Blood Banks and Collective Centres and Nursing Homes from the elderly. A study revealed that high income countries generate around 0.5 kgs of hazardous waste per bed per day in a healthcare facility, whereas low income countries

generate 0.2 kgs. The real problem lies because of non separation of hazardous and non hazardous waste, making the real quantity of hazardous waste much higher.

b. Adverse health associated outcomes from Healthcare Waste and their byproducts:

1. Sharps - inflicted injuries.
2. Toxic Exposure to pharmaceutical products, in particular, antibiotics and cytotoxic drugs released into the surrounding environment and to substances such as mercury or dioxins, during the handling or incineration of healthcare waste.
3. Chemical burns arising in the context disinfection, sterilization or waste treatment activities.
4. Air pollution arising as a result of the release of particular matter during medical waste incineration.
5. Thermal injuries occurring in conjunction with open burning and the operation of medical waste incinerators and finally radiation burns.

c. Educating the people who are handling Healthcare Waste, the risks involved in handling healthcare waste and adopting safe practices to minimize the risk and selecting safe and environmental friendly management options when collecting, handling, storing, transporting, treating or in disposing of the healthcare waste.

d. A comprehensive system is to be built for healthcare management and disposal, by addressing the responsibilities of the persons who are involved, allocation of resources for the same are the prime important factors.

e. Since healthcare waste is case specific and different from one healthcare facility to other. Management/Provider of Healthcare Facilities should develop their own strategies and regulations in disposal of the healthcare waste, segregation, destruction by adopting national and international standards for the same. Finally, the healthcare waste can be minimized by adopting proper procedures and equipment more so disposable equipment and by applying proper methods in the disposal of the same.

VIII. In this regard, World Health Organization (WHO) developed a Global and comprehensive guidance document on, **“safe management of wastes from healthcare activities”**

This guidelines addresses aspects such as, **“regulatory framework, planning issues, waste minimization and recycling, handling, storage and transportation, treatment and disposal options and training. The document also envisages, managers of healthcare facilities, policy makers, public health professionals in managers involved in waste management views in framing the document in line with WHO guidelines also the document should focus on monitory sustainable development goals in the waste management in addition water management, sanitation etc.”**

The World Health Organization in collaboration with other related organizations developed series of training modules on healthcare waste management covering all aspects of waste management activities from identification, classification and finally safe disposable either by using non incineration or incineration strategies.

World Health Organizations on guidance document on healthcare waste that is available include,

1. Monitoring Tool
2. A Cost assessment Tool
3. Rapid assessment Tool
4. A Policy Paper
5. Guidance to develop national plans
6. Management of waste from Injection activities
7. Management of waste at primary healthcare centres
8. Management of waste from mass immunization activities, and finally
9. Management of waste in emergencies.

IX. Protecting Workers Health:

World Health Organization proposed some strategies to improve health coverage of workers including those working in small companies, informal sectors with the following strategic directions,

1. Increasing skills of Primary Care Providers: General Practitioners, Nurses, Paramedics, environmental and public health technicians, community health workers are supposed to provide basic occupational health services, such as advice on improving working conditions, monitoring the health status of workers and detecting the most common occupational diseases among workers in small companies, rural areas, farms, the informal sector and among migrants.

2. Expanding the coverage and improving quality of specialized occupational health services: With a focus on assessing and reducing occupational risks; surveillance and improvement of the working environment, work organization, machinery and equipment; early detection and rehabilitation of occupational diseases; promotion of health and the provision of first-aid at the work places.

3. Establishing connections between occupational health services and primary care centres: To facilitate the care of workers suffering from chronic diseases and they are returned to work after long term absence due to sickness.

4. Developing work place health initiatives, tools and methods: For empowering the organizations and other work settings to take better care of health, without unduly relying on professional health services.

5. Including occupational health: In the pre-and-in-services training of all frontline health providers and certain medical specialists dealing with cancer, skin, respiratory and neurological diseases, and musculo skeletal disorders.

6. Developing roadmaps: For scaling up access of workers to essential intervention and services, as defined nationally, for prevention and control of occupational and work related diseases. These include monitoring coverage and setting realistic targets in line with available human and financial resources for health in local traditions.

X. Guidelines formulated by Government of India – Ministry of Health and Family Welfare for Managing Health Care Workers (HCW) working in Covid and Non-Covid areas of healthcare facilities, on 9th January 2022

i. Background:

It is to be noted that the Healthcare Workforce is a valuable resource for the country. The Healthcare personnel working in healthcare facilities are at increased risk of acquiring the infectious diseases like Covid-19 and the subsequent variants, if there is a breach in the personal protection while managing patients. It is important to ensure proper advisory to protect healthcare workers in particular in the context of “*Safety from healthcare associated infections (HAIs)*”, while managing Pandemics like Covid-19 situations.

ii. The purpose of this document is to provide guidance on,

- a. Prevention measures to be observed at the Institution/Facility level.
- b. Testing and Isolation measures for healthcare functionaries.

iii. Institutional Mechanism for preventing and responding to healthcare associated infections (HAIs) among healthcare workforce or healthcare workers:

- a. All healthcare facilities shall, activate their healthcare facility infection control committee. This Committee in healthcare facility is responsible for implementing the infection, prevention and control (IPC) activities and organizing regular training on IPC for HCWs
- b. A Nodal Officer called Infection Control Officer shall be identified and appointed by each healthcare facility to address all matters related to healthcare associated infections, with a reference to preventing such infections among healthcare workers/workforce. The Nodal Officer should see that,
 1. Health workers in different settings of hospital shall use PPEs appropriate to their risk profile.
 2. All healthcare workers have undergone training in infection prevention and control and that they are aware of common signs and symptoms, need for self health monitoring and need for prompt reporting of such symptoms.
 3. Provision should be made for regular (Thermal) screening of all hospital workforce
 4. All HCWs are vaccinated with two doses of Covid Vaccine and also take the precautionary third dose as per prescribed protocol norm.
 5. Provisions should be made for prompt reporting of breach of PPE by the facility staff and follow up action.

iv. Action of Health Care Workers:

Ensure that all preventive measures like

- a. frequent washing of hands, use of alcohol based and sanitizers, respiratory etiquettes using tissue/handkerchief while coughing or sneezing etc. are followed at all times.
- b. Appropriate PPE is used at all times while on duty.
- c. A buddy system to be followed to ensure that there is no breach in infection prevention control system
- d. Any breach in PPE and exposure is immediately informed to the Nodal Officer/HOD of the particular Department.
- e. Healthcare workers after leaving the patient care units (Wards/OPDs/ICUs) at the Doctor's duty rooms/hostel/canteen or outside the HCF must follow physical distancing and masking to prevent transmission to / acquiring infection from other healthcare workers who may be positive.
- f. Pregnant/lactating mothers and immuno-compromised healthcare workers shall inform their medical condition to the facility authorities for them to get posted in appropriate areas

v. SOP for health workforce deployment during Covid-19:

- a. SOP to be followed in case of HCW reports exposure/breach of PPE: All the healthcare workers must report every unprotected exposure/breach of PPE while managing Covid-19 patients to the concern Nodal Officer and HOD of the concerned department immediately. Such exposed healthcare workers shall continue to work wearing appropriate PPE and test themselves at day five of the exposure or if symptoms develop any time within fourteen days from the day of exposure.
- b. In care, healthcare workers report symptoms suggestive of Covid-19, SOP to be followed as under.
 1. In case of mild case, HCW will have an option of home isolation, subject to the conditions stipulated in the *“revised guidelines for home isolation of mild/assymptomatic covid-19 cases”* such cases would end their home isolation as per time line provided in the said guidelines.
 2. In case where home isolation is not feasible, such mild cases will be admitted to a covid care centre.
 3. Moderate cases that require oxygen therapy shall be managed at a dedicated Covid health centre.
 4. HCWs can resume duties while wearing appropriate PPEs if symptoms have resolved (except mild cough) and they are afebrile.
 5. Those HCWs who test negative and continue to be symptomatic, will be treated in Non-Covid Ward as per their clinical diagnosis. They can resume work based on the clinical diagnosis and the medical certification by the treating healthcare professional.

6. Discharge of Covid-19 positive healthcare workers will be in accordance with the Discharge Policy available.

7. Regular quarantine of healthcare workers after performing duty in Covid-19 areas

i. quarantine/isolation of health workers, other than stipulated above is not warranted

(<https://www.mohfw.gov.in/pdf/RevisedHomeIsolationGuidelines05012022.pdf>)

(<https://www.mohfw.gov.in/pdf/RevisedDischargePolicyforCOVID19updated9thJanuary2022.pdf>)

XI. What is Corporate Social Responsibility (CSR)?

The Ministry of Corporate Affairs in India, through sec 135 of the Companies Act 2013 has made it mandatory for companies to carry out CSR with atleast 2% of its profits from past three financial years. This policy has never been implemented by any government before in any country and in India is the first one to set up.

Sec. 135 - Corporate Social Responsibility,

“Every company having networth of Rupees Five hundred crores or more or turnover of Rupees 1000 crores or more or a net profit of Rupees Five Hundred Crores or more during any financial year shall constitute a Corporate Social Responsibility Committee of the Board consisting of three or more directors out of which at least one director shall be an independent director”

Corporate Social Responsibility in Healthcare:

In healthcare, Corporate Social Responsibility means that there is an ethical obligation that requires hospitals and other organizations to do something beneficial in issues such as delivering quality in healthcare to everyone who is entitled to it (<https://www.ncbi.nlm.nih.gov/pmc>)

XII. Conclusion:

Smt. K. Sujatha Rao, IAS (Retired), Former Health Secretary, Govt. of India, on June 9th, 2022 expressed that, I quote,

“It is time our Political Systems listen to people and take care of their everyday needs, instead of going for easy options like privatization, commodification, and medicalisation of healthcare. The lesson emerging most unequivocally from the pandemic experience is that if India does not want a repeat of the immeasurable suffering and the social and economic loss we need to make public health a central focus. The virus is still around. We have no option but to live with that reality. Covid has also shifted the policy dialogue from health budgets and medical colleges towards much needed and badly delayed institutional reforms.”

In any healthcare facility, the healthcare workers and the professionals are often exposed to infections and any transmissible disease can occur in the healthcare facility settings and may affect them. As an observation made by many Research Scholars this workforce in any healthcare facility are not only at risk

of acquiring infections but also a source of infection to patients. It is the primary responsibility of the healthcare facility administration/healthcare providers to protect both the patients and the healthcare workers from contracting/transmitting healthcare facility acquired infections by applying recommended infection control measures.

Prevention of Infectious Diseases, Occupational Diseases requires,

“The prevention of work restrictions, the reduction of healthcare facility acquired infections, in addition education, to the healthcare workforce is an important factor for improving compliance of guidelines and prevention measures. All the healthcare workers should understand the risk of infection and the route of transmission of pathogens. Hand Hygiene and standard precautions are the foundation of preventing transmission of infectious and occupational diseases to patients”

The other healthcare hazards in an healthcare facility are (a) Biological hazards, (b) Chemical hazards, (c) Physical hazards, (d) Ergonomic hazards, (e) Occupational exposure to Vancomycin, BRSA Infections, (f) Radiation effect, (g) Violence, (h) Exposure to reproductive health hazard, stress disorders etc. There are many newspaper reports both National and International regarding wide spread burnout and mass exodus of healthcare workers due to long hours and heavy work load and compounded by gravity of caring for patients especially in the Covid-19 Pandemic situation. This Pandemic Situation has opened the eyes of the healthcare providers and the government to take immediate measures to contain this.

The main important aspect of protecting the healthcare force in such situation is immunization to the healthcare workforce from specific infectious agents. Preventing infection in healthcare workforce will prevent transmission of infection from them to other healthcare workforce and patients also whom they are attending for this the evaluation committee of any healthcare facility should always in their shoes to evaluate such situations and appropriate control measures should be taken for patients as well as healthcare workforce when signs and symptoms of transmissible infectious diseases are noticed and thus reducing the impact of hospital acquired diseases. A recent study observed that 152 healthcare facility acquired infection outbreaks with a healthcare workforce as a source. These outbreaks identified are mainly associated with surgical procedures, neo-natology and gynecology departments; of which the frequently encountered pathogenes were Hepatitis B Virus, *Staphylococcus aureaus*, and *Streptococcus pyogenes*.

The important infection prevention control measures is hand hygiene and hand disinfection as per the WHO guidelines and it specifies five hand hygiene movements and are, (a) Before touching a patient, (b) Before clean/aspect procedure, (c) after body fluid exposure risk, (d) after touching a patient, (e) after touching patient surroundings.

When the healthcare workforce exposed to occupational diseases there may transmitting the same to the patients and other co-workers. The major procedures adopted by the Occupational Health Department of that healthcare facility are, (a) Identification of all health workers exposed to the patient, (b) Nasal swabs of all healthcare workers who are identified, (c) Selection of a restricted healthcare worker group to handle the infected patient – weekly Nasal Swab monitoring, (d) Cooperation with the Infection Control

Committee by reinforcing Infection control precautions, (e) Cooperation with the Micro Biologic Department by creating a swift communication system for Nasal Swab results, (f) Cooperation with the department of human resources and creation of dismissal of such healthcare workforce from that workplace by taking care of their financial position, (g) Cooperation with the hospital pharmacy for the supply of Mupirocin for all colonized or infected health workers.

There is a saying that,

“Prevention is better than Cure”

Controlling and minimizing healthcare hazards if not eliminated in any healthcare facility is a unique challenge because it involves humans, that are healthcare workforce, professionals, patients and relatives and friends of the patients should also be taken into consideration. In this regard, the health management system, technology, preventive control measures of that healthcare facility must work in synergy to control and contain exposure of infectious diseases, occupational diseases and health hazards. In such a way, that they does not interfere with safe patient care. In spite of all these things sometimes the healthcare hazards and other infectious diseases will blow in an uncontrollable manner due to lack of knowledge of the same to the healthcare workforce, management lethargyness in implementation and insufficient allocation of funds to improve the facilities that are required to combat such situation.

Administrative measures are critical in any healthcare facility to contain the transmission of such hazards from suspected to healthy ones. Tuberculosis is one such infection which is airborne. Hence, all the healthcare facilities should follow a Written Infection Control Plan, Prompt Detection and Isolation of Suspected cases as per the situation, training of staff, rapid reporting of diagnostic test results, educating the patients and the relatives and increasing awareness among all the people who are connected with the situation. In addition effective environmental controls, so that to prevent airborne, waterborne infections, by providing adequate and sufficient environment as suggested by the Prevention Control Committee of that facility. It is also important to eradicate radiation effect, Ultraviolet lights should not be placed lower in the rooms/wards where exposure to the eyes of occupants of that particular areas because even few seconds of exposure can cause eye injury. As already mentioned immunization for Healthcare Associated Infections is to be strictly followed.

Finally, in emergencies, disasters and spread of pandemics and such other crisis situations, lives and well being of the effected population must always be protected infraction of minutes otherwise the losses will be high.

For a safe and healthy facility that is accessible to such situations where immediate human control is needed. The following key factors should be kept in mind

- a. In any healthcare facility, health infrastructure that can resist exposures and forces from all types of hazards.
- b. Medicines and medical equipment that are essential in such situations should be easily accessible and protected from damages and losses from all hazards including climate change impacts.
- c. Community Infrastructure and critical services such as water, food, electricity, medical oxygen, PPT kits, Firefighting equipment, accessible passages for eviction of the patients in emergency are to be taken care of.

d. The healthcare workforce and the paramedics who are directly in touch with the patients are should be well trained in such situations to evacuate themselves and the patients from such environment to a safe place with minimum impact of the disaster.

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