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Hospital Waste Management Practices

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# HOSPITAL WASTE MANAGEMENT PRACTICES AT PAKISTAN FIELD HOSPITAL LEVEL II IN UNITED NATIONS MISSION IN LIBERIA

**Amir Ali, Roomana Anwar, Atia Suhail, Waqar Dahri**

Combined Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

## ABSTRACT

***Objective***: To assess the knowledge about hospital waste management amongst doctors, paramedic`s and general duty staff and to know various techniques of hospital waste disposal practiced at PAKMED.

***Study Design***: Cross sectional descriptive.

***Place and Duration of study***: Pakistan Field Hospital level II (PAKMED), United Nation Mission, Liberia (UNMIL), from May 2017 to Oct 2017.

***Methodology***: A total of 69 participants, age ranging between 24 to 50 years of age including 14 doctors, 40 paramedics and 15 general duty staff of different departments were selected. A questionnaire consisting of 20 questions divided in two sections was used.

***Results***: Out of 69 participants, 62 (89.85%) were males and 7(10.1%) were females. One (7.1%) of the doctors, 5 (12.5%) of paramedics and 8 (53.3%) of general duty (GD) staff was not aware of the different types of hospital waste generated in different departments. Two (14.2%) doctors, 11 (27.5%) paramedics and 8 (53.3%) general duty staff was not aware of the color coding for different types of hospital wastes. About 56 (81.1%) of the participants segregated the waste. Regarding the disposal of sharp wastes like needles, 42 (60.8%) of all participants break the needle and 21 (30.4%) use needle burner to destroy it which is the ideal method.

***Conclusion***: Knowledge about hospital waste and its management and techniques of its disposal was appropriate among majorities of doctors, paramedics and general duty staff. However there is need for improvement in the knowledge about hospital waste management system.

**Keywords**: Hospital waste, Management, Paramedic, Physicians.



## INTRODUCTION

Any surplus solid substance produced from activities related to health safety, medical diagnosis, treatment, scientific research, immunization as well as dental and veterinary departments in a hospital is referred as Medical waste[1] and waste produced at cook house, dinning and in living area containing infectious, contaminated and hazardous waste like discarded sharps, non-sharps, blood, body parts, toxic chemicals, pharmaceuticals, medical devices and radioactive substances is hospital waste[2]. Medical waste is a concern due to its ability to cause injury, potential for disease transmission and environmental pollution. The management of waste produced by hospitals using techniques and procedures that will help to check the spread of ailments through hospital standing operating procedures is Hospital Waste Management[3]. Because of its utmost importance due to its likely environmental and public health risks with high tendency to spread, medical waste management (MWM) has become a critical issue[4-5]. Infections can be transmitted to the hospital staff, attendants, and the nearby public because of Infectious waste produced from the hospitals[6]. Environmental and health dangers to the society do occur due to healthcare delivery facilities and their underlying activities which often end up with some waste products. General waste category constitutes 85% and highly infectious or toxic radioactive materials 15% of waste materials generated from healthcare facilities[7-8]. Health care waste may cause serious health issues to the society through their related environmental pollution and can become the root cause of some diseases and

**Correspondence: Dr Atia Suhail,** Pakistan Air Forces, Faisal Base, Karachi Pakistan (*Email: atiasuhail70@gmail.com)*

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epidemic outbreaks due to absence of some defined guidelines for their timely removal[4,9]. Lack of knowledge, insufficient funds, and poor discarding are the predictors which are the cause of disappointing biomedical waste management worldwide in about 18–64% of Health Care services[10].

Reports regarding the lack of health care waste management in poor countries and the problems as to why health care waste management in these countries is not up to the mark and loaded with difficulty has been highlighted among the limited number of studies available from resources. Lack of strict application of rules, lack of knowledge, and inspiration, shortage of proper technological involvements, unacceptable management-strategies, too little funds or a combination of all are the reasons of inadequate health care waste management. In the eleventh Sustainable Development Goal (SDG) of United Nations given on 71st anniversary 2016, the sixth target highlights that by paying special attention to air quality and municipal and other waste management, countries should by 2030, decrease the adverse per capita environmental impact of cities.

Studies also indicted that main risks of environmental pollution do occur due to low quality of the practices of health care personnel. They do not practice segregation which is the main step in waste management. Poor training may be the one possible causes. Another study also suggested that general practitioners needs to be trained due to poor hospital waste management practices rendered by them. Frequent training and refresher courses must be organized and conducted by hospital administration for health care workers regarding how to deal with infectious wastes. 10-15% infectious waste needs special attention and must be dealt by specialized health care workers otherwise even this small quantity of waste may create and cause health hazards and outbreaks. This can only be prevented by segregation method done by specialized health workers[10].

There is little or no data or studies regarding the production of waste, handling and disposal of waste in Liberia in general and PAKMED in particular. To best of my knowledge, this is the first study from PAKMED on health care waste management in which different hospital members including doctors, paramedics and GD staff participated. The study was an attempt to scrutinize doctors, paramedics and GD staff acquiescence with hospital waste management procedures in PAKMED level II hospital. It will also highlight the deficiencies in present system and recommendations for its improvement.

To assess the knowledge about hospital waste management amongst doctors, paramedic`s and general duty staff and to know various techniques of hospital waste disposal practiced in PAKMED level II hospital Monrovia Liberia.

## METHODOLOGY

A cross sectional study was conducted to assess the knowledge of hospital waste management by doctors, paramedics and GD staff. This study was carried out from May 2017 to Oct 2017, at Pakistan Field Hospital level II (PAKMED) in United Nation Mission in Liberia (UNMIL). Data was collected by using validated questionnaire for the study. A minimum sample size of 63 was calculated by WHO Sample size calculator with a confidence level of 99% and non-probability convenient sampling technique was used. We included all the staff (n=69) at PAKMED Level II hospital Liberia including doctors of all specialties in this study. Ethical clearance was obtained from the ethical committee of PAKMED level II hospital Liberia and informed written consent was taken from all the participants. Objective of this study was to evaluate knowledge and practices of doctors, paramedics and GD staff regarding hospital waste management at PAKMED level II hospital, a specifically designed questionnaire consisting of 20 questions was floated and it was divided into two sections. The first part of the questionnaire includes socio-demographic data of respondent. The confidentiality of respondents and data was kept private. In second part,

questions related to the knowledge, insight and practices of the respondents regarding the management of different hospital wastes were included. Investigator circulated the questionnaire to respondents and all complete questionnaires were made clear to avoid any doubt. The questionnaire were collected after one week. The data was updated on an excel sheet using Microsoft Excel 365 and data analysis was done using SPSS-20.

## RESULTS

The age of doctors, paramedics and GD staff ranged between 24-48 years, (mean age of participants (33 ± 6.5). Out of 69 members, 62

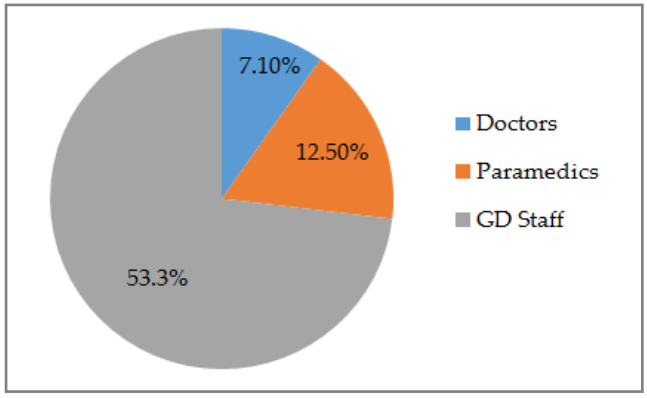


**Figure-1: GD staff lack of awareness of the different categories of hospital waste generated in ifferent departments.**

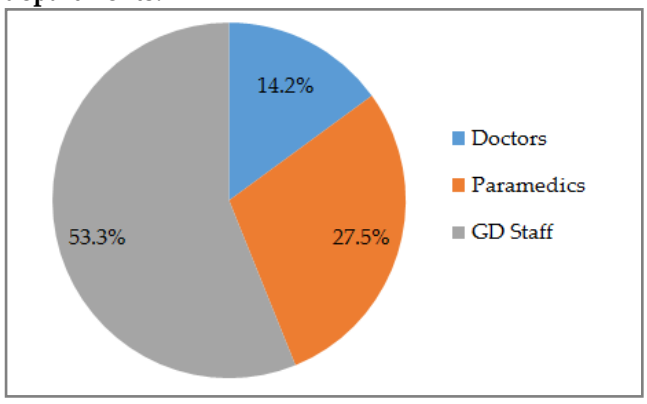


**Figure-2: GD staff lack of awareness of the color coding for different types of hospital waste.**

(89.86%) were males and 7 (10.14%) were females. When asked about the category of removed IGTN, 49 (71%) gave a right answer that it comes under the category of infected waste. Out of 69, 20 (28.9%) were not knowing the category of used needles and syringes and 40 (57.9%) were aware of category 4 (waste sharps). Only 21 (30.4%) participants said expired drugs come under cytotoxic waste. When asked about used cotton, 42 (60.8%) correctly said it falls under soiled waste. About 4 (5.7%) participants were not aware of the hospital waste management WHO SOP. About 48 (69.5%) knew that human anatomical waste should be disposed in yellow color container and 14 (20.2%) did not know. Regarding the practices of the doctors, paramedics and GD staff regarding hospital waste management about 56 (81.1%) of the participants segregated the waste. Regarding the discarding of sharp

**Figure-3: United Nations Waste Disposal Unit.**

**Figure-4: Pakmed Personnel Burying Ash after using Incinerator.**

wastes like needle, 42 (60.8%) would break the needle and 21 (30.4%) used needle burner to demolish it which was the perfect technique. Uncovered x-ray films which could be considered as general wastes were disposed in common bin

by 47 (68.12%) of the participants. Forty nine (71%) of the participants dispose orthopedic wires and implants in common bin and 15 (21.7%) deformed and disposed it. Outdated and contaminated medicines were disposed in common bin by 15 (21.7%) the participants and 50 (72.4%) disposed it in secured landfill which was the ideal method. One (7.1%) of the doctors, 5 (12.5%) of paramedics and 8 (53.3%) of GD staff were not aware of the different types of hospital waste generated in different departments (fig-1). Regarding the color coding of different types of hospital wastes, 2 (14.2%) doctors, 11 (27.5%) paramedics and 8 (53.3%) general duty staff were not aware of the fact (fig-2).

**Table: Hospital Waste Categories and Disposal**

| Category | Type of Waste | Appropriate Treatment & Disposal |
|---|---|---|
| 1 | Human anatomical waste | Incineration/deep burial |
| 2 | Animal waste | Incineration/deep burial |
| 3 | Microbiology & biotechnologywaste | Incineration/deep burial |
| 4 | Sharps | Incineration/disinfection/chemical treatment /mutilation |
| 5 | Medicines and cytotoxic drugs | Incineration/destruction and disposal in secured landfill |
| 6 | Soiled waste (Blood and Body fluids) | Autoclave/chemical treatment/burial |
| 7 | Solid waste (disposable items) | Autoclave/chemical treatment/burial |
| 8 | Liquid waste (blood & body fluids) | Disinfection by chemicals/discharge into drains |
| 9 | Incineration Ash | Disposal in municipal landfill |
| 10 | Chemical waste | Chemical treatment/secure landfill |

## DISCUSSION

About various steps involved in the process of hospital waste management, health-care waste associated risks and prevention and transmission of associated infections, general information and knowledge of the participants' was very much according to their professional qualifications[11-16]. Non-infectious which becomes infectious and hazardous when the two types get mixed, forms main bulk of health care waste. As per guidelines, isolation should be a rule without exception. The problems and issues of waste disposal from hospital practices can be divided into two main areas. First, there is a lot of environmental burden of different unsafe products and second, the persons who handle the waste are directly exposed to this danger. The results of this study give an important insight into correct practices in the hospital waste management and in the consequent need for development to educate the participants. Bring up to date, clarity, input, significance, basic necessities and overall management needs improvement however knowledge and watchfulness were reasonable[17,18].

A similar study was conducted in America illustrated that majority of the administrators, not only well thought-out hospital waste management an important issue, but also intended at reducing 67% of the waste by re-cycling to decrease waste generating products[19].

On the other hand, a study in Karnatika, India, showed that for efficiently completing individual task in hospital waste disposal, proper training in separate teaching elements at each level should be targeted[20].

In PAKMED level II hospital Liberia, there are different important people involved in the management of Hospital waste starting from paramedical staff in wards to plastic disposal unit (PDU) (fig3), photograph was taken with the consent. All contingents to appropriately handle risky substances, including medical material and equipment as per Environmental Policy for UN Field Missions. In the mission area hospital waste is disposed through incineration (fig-4),

sterilization, microwave methods and electro-thermal deactivation or by local contracts with medical agencies of the host nations. It is pertinent that medical authorities make sure that the disposal method does not pose any immediate or future danger to health workers or the local population regardless of the disposal method adopted by them[21]. At present, there are clearly elaborated guidelines or policies regarding the suitable management of medical waste in PAKMED hospital Liberia. PAKMED hospital has agreed to procedure for safe disposal of hospital waste in association with local suppliers hired by United Nation and Social welfare department, Government of Liberia.

Right from production of hospital waste to its removal from the hospital, the study finds out knowledge of hospital staff about the hospital waste management practice. This generated information will be helpful in developing appropriate management policies for improving it in many similar settings. Design, question material, study and response rates can influence the soundness and dependability of questionnaire based surveys. The benefit of a questionnaire as a data compiling technique is chance of collecting a lot of data from large number of respondents comparatively fast and sensibly.

## CONCLUSION

Knowledge about hospital waste and its management and techniques of its disposal is appropriate among majorities of doctors, paramedics and GD staff. However there is need for improvement in the knowledge about hospital waste management system.

## RECOMMENDATIONS

1. Continuing hospital education on hospital waste management for hospital doctors, paramedics and GD staff is an always needed.
2. To enhance hospital waste management practices, co-ordination between doctors, paramedics, other staff and the managers needs to be established.
3. Doctors should try to decrease the hospital waste production in their departments.
4. To create a uniform policy for implementation all across UNO like other policies, a multi mission wide survey of waste management procedures and practices indifferent levels of UN hospitals across the globe is recommended.

## CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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