

**Summer Training at
Shri Mata Vaishno Devi Narayana Superspeciality Hospital,
Katra-Jammu**

**Plan for Management of Healthcare Waste and Hospital Infection –In a
New Hospital Set up**

**By
Sania Loona**

**Under the guidance of
Brig (Dr.) S.K. Puri**

**MBA Hospital and Health Management
2015-2017**



**The IIHMR University, Jaipur
2016**

CERTIFICATE

This is to certify that **Dr.Sania Loona** student of **MBA in Hospital and Health Management, 2015-17** from the IIHMR University; Jaipur has undergone summer training at **Shri Mata Vaishno Devi Narayana Superspeciality Hospital, Katra** from 1st April to 31st May, 2016.

The candidate has successfully carried out the study designated to her during summer training and her approach to the study has been sincere, scientific & analytical.

The internship is in fulfilment of the course requirements.

I wish her all success in future endeavours.



Col. (Dr.) Ashok Kaushik
Dean (Academics & Student Affairs)
IIHMR University, Jaipur



Dr.S K Puri
Professor
IIHMR University, Jaipur



SMVD/Trainee/ 003

Dt. 04th June' 2016

INTERNSHIP CERTIFICATE

This is to certify that **Dr. Sania Loona D/O Mr. S. K. Loona** bearing **Enrollment No: U/01/2015-17/0343** from **Indian Institute Of Health Management Research from Jaipur, Rajasthan**, has successfully completed his Project on **"Plan for Management of Healthcare Waste and Hospital Infection – In a new hospital"** from **01st April'2016 to 04th June'2016** at **Narayana Vaishno Devi Specialty Hospitals Pvt. Ltd**, Kakryal (Village & Post), Katra Tehsil, Reasi, District, Jammu & Kashmir- 182320

During her internship period, she has shown keen interest to observe and learn with good conduct.

We wish her all the best for her future endeavours.

for **Narayana Vaishno Devi Specialty Hospitals Pvt.Ltd**

Raman Kumar
Senior Manager - Human Resources

Narayana Vaishno Devi Specialty Hospitals Pvt. Ltd.

Shri Mata Vaishno Devi Narayana Superspeciality Hospital, Kakryal, Katra, Reasi, Jammu & Kashmir 182 320

(CIN No:U85110KA2014PLC076218). www.narayanahealth.org. Ph. : 01991-285511, 01991-285522

Registered Office: 258/A, Bommasandra Industrial Area, Anekal Taluk, Bangalore 560099

Corporate Office: 261/A, 2nd Floor, Bommasandra Industrial Area, Anekal Taluk, Bangalore 560099

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I am also grateful to all the department heads and staff for giving me time in spite of their hectic schedule .Without their active cooperation and participation it would not have been possible to accomplish my project successfully.

Sincerely
Dr. Sania Loona
(MBA HM, 2015-2017)

PREFACE

Summer internship is an integral part of MBA-HM curriculum. As a part of the course, the students of first year are required to undergo two months field training known as “Summer Training” at any reputed organization to get in depth exposure to various departments of the organization and understanding of health care delivery system and its functions.

The major objectives of the summer internship are as follows:

1. To understand and learn day to day micro-level operational management of a Hospital/ Health Care organization in field of health.
2. To study identified issues/problems associated with some specific operational area/programmes.

Summer training should be completed with dedication and should be valued for the exposure it provides.

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1. ORGANISATIONAL PROFILE

Shri Mata Vaishno Devi Narayana Superspeciality Hospital is a perfect blend of technological excellence, complete infrastructure, competent care and heartfelt hospitality - this is how the people, whom the hospital has been fortunate to serve, define the hospital. It is a 250 bedded Superspeciality tertiary care hospital, located at Kakryal, Katra within a sprawling campus of 30 acres offering high quality affordable medical care to the people within Jammu and Kashmir and bordering states as well.

Shri Mata Vaishno Devi Narayana Superspeciality Hospital is a unit of Narayana Hrudayalaya Ltd. in partnership with Shri Mata Vaishno Devi Shrine Board and is poised to cater to patients for over 20 different specialties with special focus on Cardiac Sciences and Oncology .Hospital commissioned OPD services on March 15, 2016 and IPD services on April 8, 2016. Till now hospital has provided OPD services to more than 10000 patients and IPD services to 1000 plus patients.

Narayana Health is a leading Health organization which is headquartered at Bangalore, India. The group was founded in the year 2000 under the guidance and stellar leadership of Dr. Devi Shetty, along with the “Asian Heart Foundation”. At present, the group has 31 hospitals at 19 locations, with over 1500 full time Doctors and has over 15,000 employees. On an average across all the locations, 150 surgeries are performed daily and over 80,000 outpatients are seen every month.

Narayana Health has also setup the first Health City in the outskirts of Bengaluru, spread over 25 acres. The Health City consists of more than a 1000 bed cardiac hospital and a 1400 bed multi specialty hospital, becoming one of Asia’s most advanced Cancer Care facility. It also has India’s largest Bone Marrow Transplant unit.

“Narayana Health has an aim of achieving **100% Patient satisfaction.**”



Shri Mata Vaishno Devi Narayana
Superspeciality Hospital

Managed by Narayana Health



1.1 Vision: "Our vision is affordable quality healthcare to the masses worldwide."

1.2 Mission: "Our dream of making quality healthcare available to the masses worldwide"

1.3 Values: Core values are represented by the simple acronyms **iCARE**

- I- Innovation & efficiency

To continuously reduce the cost of delivery of high quality health care and improve our reach.

- C- Compassionate care

In providing accessible service that makes a difference to our patients.

- A- Accountability

To honour commitments to our patients, employees and investors with integrity and transparency.

- R- Respect for all

Recognise the contribution of every employee and respect the rights as well as the dignity of every patient and employee.

- E- Excellence

Where we individual excel to collectively ensure the highest quality of consistence and reliable services to our patients and sustainable values to all our stakeholders.

1.4 Scope of Services:

- Anaesthesia & Critical Care
- Department of Cardiac Science
 - Cardiac Anaesthesia
 - Cardiac Electrophysiology
 - Cardiothoracic & Vascular Surgery
Paediatric & Adult
 - Interventional Cardiology
Paediatric & Adult
 - Non Invasive Cardiology
ECG, ECHO, HOLTER, TMT
- Department of ENT
- Department of Dentistry
- Department of Gastro Science
 - Gastroenterology & Haematology

- G.I & Laparoscopic Surgery
- Department of Neuro Sciences
 - Neurology
 - Neurosurgery
- Department of Paediatric
 - Neonatology
 - Paediatric
 - Paediatric Surgery
- Department of Plastic Surgery
- Department of Renal Sciences
 - Dialysis
 - Nephrology
 - Urology
 - Transplant Services (Liver)
- General & Laparoscopic Surgery
- Institute of Bone, Joint & Spine
 - Hand & Upper Limb Surgery
 - Joint Replacement
 - Spine surgery
- Internal Medicine
- Obstetric & Gynaecology
- Department of Nuclear Medicine
- Oncology Haematology
- Oncology Medical
- Oncology Surgical
- Radiation Oncology
- Pulmonology
- Pulmonology-Interventional
- Emergency / Casualty

DIAGNOSTIC SERVICES

1. Non Invasive Cardiology Services

- Echocardiography - Adult
- Echocardiography - Paediatric
- Foetal Echocardiography
- Trans-oesophageal Echocardiography
- Treadmill Test
- ECG and Holter
- EEG/ ENMG
- PFT

2. Radiology Services

- X-ray
- MRI Scan
- CT scan (128 slice)
- Ultrasound

3. Nuclear Medicine- Gamma Imaging

4. LINAC

5. Laboratory Medicine

- Biochemistry
- Clinical Pathology
- Haematology
- Histo-Pathology

- Microbiology

6. Blood Bank

7. Endoscopy / Bronchoscopy Services

SUPPORT SERVICES

1. Cardiac Rehabilitation

2. Counselling

3. Ambulance services

4. Telemedicine

5. CSSD

6. MRD

7. Human Resource

8. Purchase and inventory

9. Pharmacy

10. Morgue

11. Strategic Initiative- Includes Marketing , Branding , corporate communication cell, claims recoveries , corporate relations and relationship with other partners

12. Library

13. OP Pharmacy & IP Pharmacy

14. Waste management.

OUT SOURCE SERVICES FOR THE HOSPITAL

1. Housekeeping

2. Security
3. Laundry
4. F &B services
5. MEP services
6. Specialised Lab Investigations

1.5 DEPARTMENTAL SERVICES:

1. Outpatient Department:

There are 5 decentralised OPD:

1. East OPD (1-16)
2. West OPD (1-5, Gynae and Paediatrics)
3. Cardiac OPD
4. Gastro OPD
5. Oncology OPD

OPD Timings: 9am to 5pm.

Average no. of OPD patients 240-250 per day (Including old and new patients)

2. In-Patient Department:

- General Ward 1:
Location: Ground Floor
Bed Capacity: 6 Beds
- General Ward 2,3,4:
Location: First floor
Bed Capacity: 18 Beds
- General Ward 5,6,7
Location: Second Floor
Bed Capacity: 18 beds
- CCU
Location: First floor

Bed Capacity: 14 Beds

- SICU

Location: First floor

Bed Capacity: 10 Beds including 3 beds for isolation

- ANC Ward

Location: Second Floor

Bed Capacity: 5 Beds with 2 Beds in Labour room

- Paediatric Ward

Location: 1st Floor

Bed Capacity: 6 Beds

- PICU

Location: 1st Floor

Bed Capacity: 5 Beds

- NICU

Location: 1st Floor

Bed Capacity: 5 Cribs

- Post Operative Ward

Location: Second Floor

Bed Capacity: 14 beds

- Semi Private :

Location: (Ground Floor, First Floor, Second Floor)

Bed Capacity: 24 beds

- Private Ward

Location: (Ground Floor, First Floor, Second Floor)

Bed Capacity: 18 Beds

3. Emergency Services:

Location: Ground floor

Entrance: Separate entry from the main road

The Emergency Department is a well equipped 10 bedded department. 3 beds for each triage category Red, Yellow, Green and 1 bed for isolation

Staff: 1 Emergency In- charge, 3 MO, 1 Nursing In- charge, 10 Staff nurse.

Ambulance service is provided with collaboration of Shrine Board, 2 A.C.L.S (Advanced Cardiac Life Support Ambulances) have been created which cater to serve patients.

4. Operation Theatre:

There are total of 7 OTs

Location: Second Floor

Easy access to CCU, Blood Bank, Emergency and CSSD

Post Operative ward is attached to the OTs

Manpower: Head of the Department, 3 Anaesthetist, 2 OT in-charge, 5 OT Technicians, 10 Staff Nurse, and 3 House Keeping Staff.

5. Cardiac OPD:

Location: First floor

Separate OPD for cardiology cases

Facilities available:

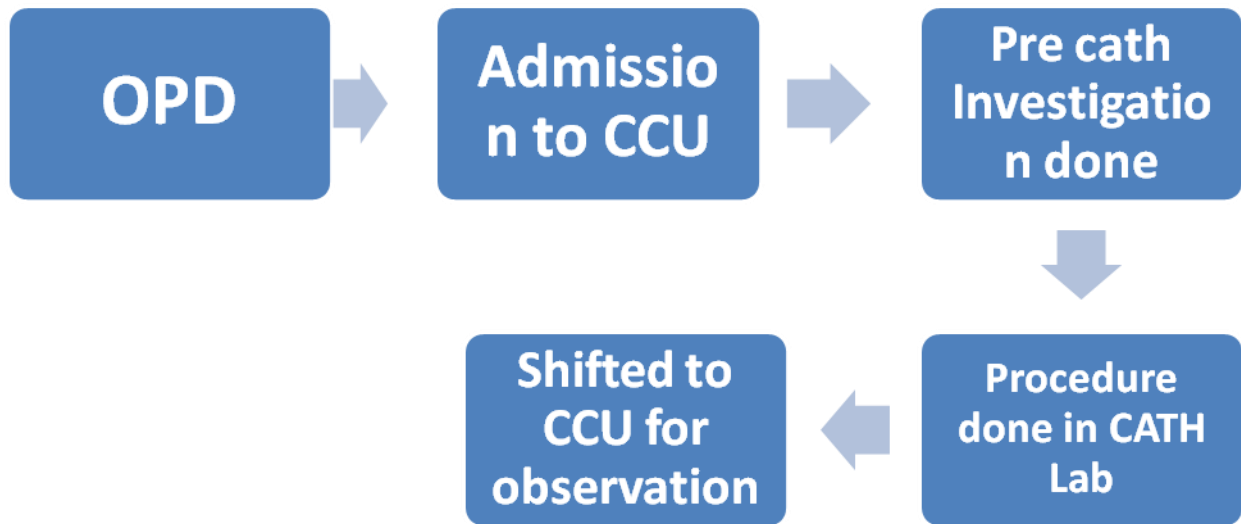
- TMT
- Electrocardiography
- Echocardiography
- Electromyography

6. Catheterisation Lab:

Location: First Floor

All Invasive Procedures are done in cath lab such as Angiography, Angioplasty, Cath Study, and Electro Physiological Study.

Process Flow:



7. CSSD-Central Sterile Supply Department

Location: Basement

Total Area is divided into 4 Zones:

- Zone I. (Dirty Utility) Reception , Inspection and Documentation
- Zone II. (Clean Area) Assembly and Packing
- Zone III (Sterile Area) Sterilisation
- Zone IV (Issue Area) Storage and distribution

Check for proper sterilisation

- Bowie dick test
- Leak test
- Sterilisation test
- Biological Indicator
- Batch monitoring test

Equipments in CSSD

- Washer disinfectant
- UV cleanser
- ETO
- Steam Sterilizer(2 in number)

8. Radiology Department:

Location: Ground Floor

Area:

- Reception Area
- Console Room
- Imaging service room
- Changing room

Different rooms for X-Ray, Ultrasound-2, MRI, CT scan, and Mammography

9. Phlebotomy Room (Sample collection room)

Location: Ground Floor

Samples collected and sent to laboratory for further processing.

10. Laboratory:

Location: First floor

All laboratory services related to Biochemistry, Microbiology, Histopathology and Haematology.

Equipments:

- Beckman Coulter
- Biochemistry Machine
- ABG Analyzer
- ELISER reader
- Immunoassay
- BIOSAFETY Cabinet
- Hot Air Oven

11. Blood Bank:

Location: First Floor

Equipments:

- Plasma thawing bath
- Ultra low freezer
- Refrigerated centrifuge machine
- Plasma freezer capacity
- Platelet incubator agitator stabilizer
- Bio safety Cabinet

12. Physiotherapy and Rehabilitation Centre:

Location: First Floor

Well trained team of 2 physiotherapist managing the department and providing rehabilitation therapy for joint disease, stokes, trauma etc.

Other facilities:

- Wax Therapy
- Hydro collator- hot pack
- Interferential Therapy
- IFT- Pain Relief
- Ultrasound therapy- piezoelectric effect
- TENZ
- Muscle Stimulator
- SWD etc

13. Chemotherapy department

Location: First Floor

2 day care centres – 9 beds in each day care centre

14. Medical Record Department:

Scope of Services:

- Maintenance of all medical record
- Storage of records
- Maintaining the integrity and confidentiality of all medical record

- Maintenance of MLC cases
- Numbering and filing
- Completion of all incomplete records.

15. Food and Beverages:

Location: Basement

Scope of services:

- To provide well balance nutritious food to all in patients as well as patients for dialysis as per their needs.
- To serve staff and patients attendants
- To helps in improving the patient's condition by providing hygienic, proper and nutritious food as prescribed by the dieticians.

Provide 5 servings for the general ward patients and 8 servings to the semi private and private ward patients.

Types of diet:

- Normal full diet
- Liquid diet
- Soft diet
- Diet for diabetic patients
- Diet for renal patients
- Diet post cardiac surgery patients.

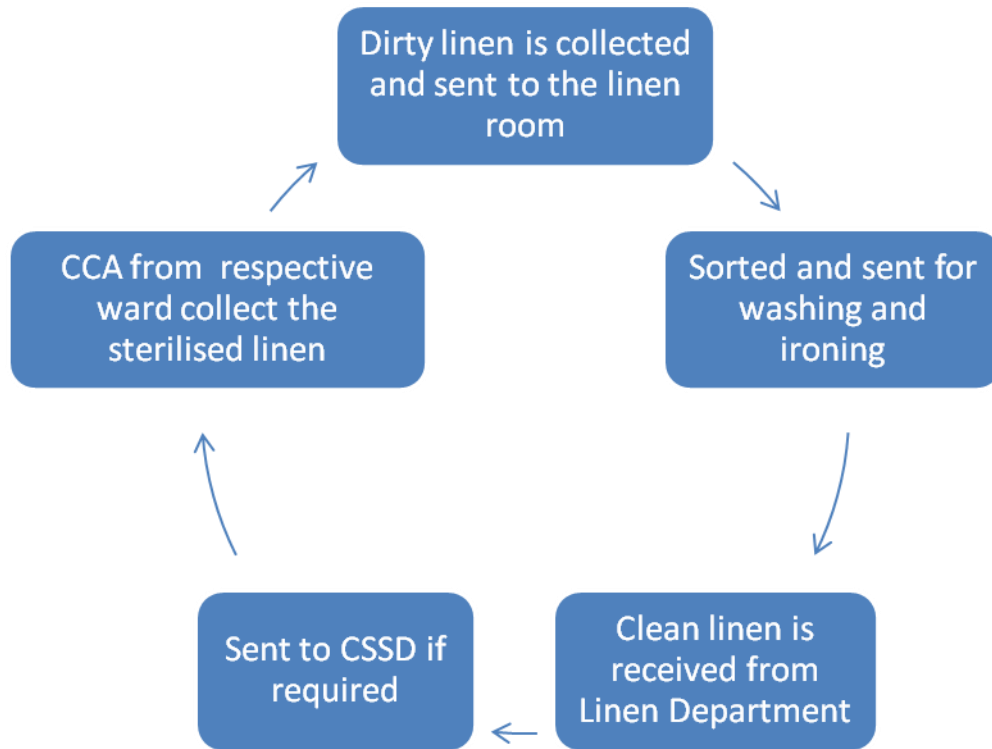
16. Housekeeping:

Services provided

- Maintain hygiene of the patients and the hospital
- Helping in patients preparation
- Infection control
- Waste disposal

17. Linen and Laundry:

Location: Ground Floor



Availability of coloured coded bags in each department. Yellow colour is for serology positive patients and Red bags for serology negative patients.

18. Pharmacy:

The hospital 2 different types of pharmacy:

- OPD Pharmacy(ground floor)
- IPD Pharmacy(first floor)

Functions:

Dispensing of drugs to all the admitted patients.

Dispensing of drugs for the OPD patients.

Demand estimation according to the formulary, in the absence of formulary, establishment of specification for drug procurement

Furnishing of new drug information to consultants and other professional staff
Quality control of drugs purchased

19. Diagnostic Services:

Location: - Basement

Scope of services

- Electroencephalography
- Pulmonary function test
- Bronchoscopy
- Endoscopy

Operational timings: 9 am to 5 pm.

20. Dialysis Department:

Location: ground floor

Bed Capacity: 14 beds including 02 beds for serology positive patients

No of procedures done per day: 2-3 dialyses per day

Shift of dialysis: 7 am to 12 noon, 12 noon to 5 pm and 5pm to 8 pm.

Every patient is provided with a meal, included in tariff and the meal is prescribed by the dietician.

21. Security Services:

Security service department of the hospital is outsourced.

Functions:

- To provide security services to all the staff, patients, relatives and visitors
- To protect the hospital property within the premises
- To analyse threats and vulnerability in conjugation with the managements , police and others
- To control the movement of vehicular traffic inside the premises.

22. Billing and Finance Department:

Location: Ground floor

Operational timings: 9am to 5 pm for the finance department
24 hr IP billing service.

Functions:

- To provide salary to all the staff in a timely manner
- To provide payment to all the vendors and contractors
- Tracking the expenses of in patients on daily basis
- Timely discharge of patients related to financial clearance
- To provide accurate and timely financial information for decision making.

23. Maintenance Department:

Location: Lower ground floor

Functions:

- To maintain continuous electric supply to the hospital.
- To maintain the chilling plant room of the hospital
- To maintain the supply of medical gases
- To maintain the proper functioning of STP

Operational timings: 24hr.

Infrastructure:

Low tension room

Air Handling Unit

Generator panel: 2 generator of 750 ampere each

Diesel tank- 24 kilolitres capacity

Sewerage treatment plan

Desk panel- control air handling unit

Chilling plant room

Gas manifold room

Oxygen Generation Plant

AGSS Plant

Biomedical waste management plant

24. Human Resource Department:

Location: ground floor

Functions:

- Recruitment based on requisition form from respective department duly signed by in-charge of the department, HR and facility director
- Induction and training programs- 3 days induction program for all new employees
- Performance appraisal ones in a year in the month of March
- Employee engagement activities such as birthday celebration, open house, and also on the job trainings such as fire safety. BLS training
- Grievance Handling
- Conduct employee exist interview

25. Fire safety Department:

Location: ground floor

The hospital has 08 fire exits door in each floor. A total 26 functional fire exist doors

Sprinklers are located in the entire hospital with a distance of 6 metres between two sprinklers and burst at 68 degree Celsius

Smokes detectors are also located in the entire hospital.

Fire Safety Equipments:

- | | |
|------------------------|----|
| • Horse Reel Drums | 10 |
| • Jockey Pump | 01 |
| • Alarm Valve | 05 |
| • Double Hydrant Valve | 28 |

Hospital follows “PASS” and “RACE” protocols.

PASS: Pull Aim Squeeze Sweep for operating a fire extinguisher

RACE: Rescue Alarm Contain Extinguish, Evacuate.

26. Radiotherapy Department

Location: basement

Equipments: Linear Accelerator
: Brachytherapy

PROJECT REPORT

Plan for management of Healthcare waste & Hospital Infection –In a New Hospital Set up”

Project Guide:

Dr.Harman Loona

G.M. Operation Management

2.1 INTRODUCTION

Hospital Acquired Infection (also called Nosocomial infection): This is defined by the World Health Organization (WHO) as: “An infection acquired in hospital by a patient who was admitted for a reason other than that of infection. An infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission which includes infections acquired in the hospital but appearing after discharge and also occupational infections among staff of the facility”.

Hospital-acquired infections add to functional disability and emotional stress of the patient and in some cases, lead to disabling conditions that reduce the quality of life. Nosocomial infections are also one of the leading causes of death.

The economic burden of HAI is considerable. The increased length of stay for infected patients is the greatest contributor to cost. The increased use of drugs, the need for isolation, and the use of additional laboratory and other diagnostic studies also contribute to costs.

Prolonged stay not only increases direct costs to patients or payers but also indirect costs due to lost work.

- **"Bio-medical waste"** waste generated during the diagnosis, treatment or immunisation of human beings or animals or research activities or in health camps, including the categories mentioned in *Schedule I of Bio-medical Waste Management Rules, 2016*.
- **"Bio-medical waste Authorisation"** means permission granted by the State Pollution Control Board (SPCB) for generation, storage and disposal of bio-medical wastes.
- **"Bio-medical waste treatment and disposal facility"** means facility wherein treatment and disposal of bio-medical waste or related processes is carried out, and includes common bio-medical waste treatment facilities (CBMWTF).
- **"Health care facility (HCF)"** means a place where diagnosis, treatment or immunisation of human beings or animals is provided irrespective of type and size of facility.
- **"Occupier"** means a person having administrative control over the institution and the premises generating bio-medical wastes.

2.2. LITERATURE REVIEW

Studies in India and other developing countries have shown lack of knowledge and poor practice of biomedical waste management (BMW). Hence study was undertaken to know the KAP of BMW in a hospital, to identify the gaps and to take necessary steps for rectification. This was an observational descriptive hospital based cross sectional study. The study group included the 337 healthcare personnel which included doctors (residents), nurses, laboratory technicians and multi-purpose workers. The study was done using a pre-tested semi-structured questionnaire. The data was analyzed using software SPSS 20 version. Proportions were used for interpretation. It showed that <50% of nursing staff and <25% of MPWs had the knowledge of color coding and segregation. There was also poor knowledge regarding disposal of sharps among technicians and MPWs. It also brought to our notice that only 50% of the doctors (residents) and nursing staff and 26% of the laboratory technicians have undergone training in BMW management. None of the MPWs had received training regarding BMW management. They had good knowledge regarding the diseases transmitted through improper bio medical waste handling. This study revealed that there is the need to continue the training programme for BMW and to include technicians and MPWs in the programme. It also shows that the administration needs to put protocols, provide PPE and other resources for better compliance of BMW rules. (**Malini A, Bala Eshwar; 2015**).

Rao P H, (2008) conducted a study on awareness and practice of hospital waste management in Hospitals/nursing homes and private medical practitioners in urban as well as rural areas and those from the private as well as the government sector in Andhra Pradesh, Maharashtra and Uttar Pradesh in India. Information on awareness of bio-medical waste management rules, training undertaken and practices with respect to segregation, use of color coding, sharps management, access to common waste management facilities and disposal was collected. Awareness of Bio-medical Waste Management Rules was better among hospital staff in comparison with private medical practitioners and awareness was marginally higher among those in urban areas in comparison with those in rural areas. Training gained momentum only after the deadline for compliance was over. Segregation and use of color

codes revealed gaps, which need correction. About 70% of the healthcare facilities used a needle cutter/destroyer for sharps management. Access to Common Waste Management facilities was low at about 35%. Dumping biomedical waste on the roads outside the hospital is still prevalent and access to Common Waste facilities is still limited. Surveillance, monitoring and penal machinery was found to be deficient and these require strengthening to improve compliance with the Bio-medical Waste Management Rules and to safeguard the health of employees, patients and communities. **Waseem Q. et al (2007)** conducted a study on awareness of bio medical waste management among the staffs of the Government SMHS hospital, Srinagar. 150 questionnaires were distributed among doctors, nurses and the paramedical staffs respectively. The answers obtained in the form of positive and negative responses were subjected to statistical analysis using t test and chi-square tests P values of, 0.005 were considered significant. The result of the study revealed that among doctors there is enough knowledge regarding awareness about hazards of bio medical waste and risk of infection like hepatitis and AIDS. Definite positive response regarding the subject was 86% (p value= 0.005). Significant awareness was found among nursing staffs as well, who were found aware of possible health hazards of bio medical waste. Positive response regarding the subject was 58% (p value=0.05). However among paramedical personnel positive response regarding the subject was 11% (p value=0.05). The findings suggest that there is inadequate knowledge about the subject and poor concept of bio medical waste among the paramedical personnel.

2.3 Rationale of the study:

Modern hospitals are complex, multidisciplinary systems which consist of different facets of medical care as well as research facilities. In the course of functioning of hospitals, there is a considerable amount of hospital wastes generated. There have been an expansion of both private and public sector hospitals in all countries and hence, the importance of hospital waste management is increasing day by day.

In India every day per bed in hospitals around one and a half kilogram of hospital wastes are generated. Amongst such wastes, about fifteen percent is hazardous of which ten percent is hazardous, infective and eighty five percent is non hazardous. Since only fifteen

percent is hazardous, it is important to stress on proper hospital waste management.

Biomedical wastes are hazardous and if they are not segregated at the time of disposal, then all the hospital wastes become hazardous. The rationale behind hospital waste management is that, injuries can occur from the sharps disposal if not properly handled; then again, patients with poor immunity systems can become infected with the hospital wastes if disposal is not properly implemented. Risk of infection is greatest amongst waste handlers and the general public who live in the vicinity of such landfill areas where such wastes are disposed. Hence, separate handling of the different category of wastes is important with color codes and proper training of hospital staff to ensure proper disposal and treatment of hospital wastes.

To comply with *Biomedical Waste Management Rules, 2016*, which pertain to the segregation and proper disposal of bio-medical wastes and to ensure that human health and the environment are protected.

2.4. CHALLENGES:

Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, nursing home authorities but also to the environment. The bio-medical wastes generated from health care units depend upon a number of factors such as waste management methods, type of health care units, occupancy of healthcare units, specialization of healthcare units, ratio of reusable items in use, availability of infrastructure and resources etc.

The proper management of biomedical waste has become a worldwide humanitarian topic today. Although hazards of poor management of biomedical waste have aroused the concern world over, especially in the light of its far-reaching effects on human, health and the environment.

Now it is a well established fact that there are many adverse and harmful effects to the environment including human beings which are caused by the “Hospital waste” generated during the patient care. Hospital waste is a potential health hazard to the health care workers, public and flora and fauna of the area. The problems of the waste disposal in the hospitals and other health-care institutions have become issues of increasing concern

2.5. PROBLEMS RELATING TO BIOMEDICAL WASTE

A major issue related to current Bio-Medical waste management in many hospitals is that the implementation of Bio-Waste regulation is unsatisfactory as some hospitals are disposing of waste in a haphazard, improper and indiscriminate manner.

Lack of segregation practices; results in mixing of hospital wastes with general waste making the whole waste stream hazardous. Inappropriate segregation ultimately results in an incorrect method of waste disposal.

Inadequate Bio-Medical waste management thus will cause environmental pollution, unpleasant smell, growth and multiplication of vectors like insects, rodents and worms and may lead to the transmission of diseases like typhoid, cholera, hepatitis and AIDS through injuries from syringes and needles contaminated with human.

Various communicable diseases, which spread through water, sweat, blood, body fluids and contaminated organs, are important to be prevented. The Bio Medical Waste scattered in and around the hospitals invites flies, insects, rodents, cats and dogs that are responsible for the spread of communication disease like plague and rabies. Rag pickers in the hospital, sorting out the garbage are at a risk of getting tetanus and HIV infections. The recycling of disposable syringes, needles, IV sets and other article like glass bottles without proper sterilization are responsible for Hepatitis, HIV, and other viral diseases. It becomes primary responsibility of Health administrators to manage hospital waste in most safe and eco-friendly manner⁶.

The problem of bio-medical waste disposal in the hospitals and other healthcare establishments has become an issue of increasing concern, prompting hospital administration to seek new ways of scientific, safe and cost effective management of the waste, and keeping their personnel informed about the advances in this area. The need of proper hospital waste management system is of prime importance and is an essential component of quality assurance in hospitals.

2.6. Need of biomedical waste management in hospitals

The reasons due to which there is great need of management of hospitals waste such as:

1. Injuries from sharps leading to infection to all categories of hospital personnel and waste handler.
2. Nosocomial infections in patients from poor infection control practices and poor waste management.
3. Risk of infection outside hospital for waste handlers and scavengers and at time general public living in the vicinity of hospitals.
4. Risk associated with hazardous chemicals, drugs to persons handling wastes at all levels.
5. “Disposable” being repacked and sold by unscrupulous elements without even being washed.
6. Drugs which have been disposed of, being repacked and sold off to unsuspecting buyers.
7. Risk of air, water and soil pollution directly due to waste, or due to defective incineration emissions and ash.

2.7. ADVANTAGE OF PROPER BIO-MEDICAL WASTE DISPOSAL

Effective medical waste disposal is the first and foremost way to prevent unwanted disease and prevent untoward infection from medical wastes. All staff in any hospital or laboratory is equally responsible in housekeeping. Good housekeeping can reduce the infection to a great extent. It also cuts down on the spreading of microorganisms and bacteria. The advantages of proper medical waste disposal include the creation of a healthy atmosphere that is free from microbes, thus minimizing the risk of infection to staff, visitors and other people, cutting off unpleasant sights and bad odors, and the reduction of fleas and insects.

2.8. RESEARCH QUESTION

An experimental study design among Housekeeping and Nursing staff of Shri Mata Vaishno Devi Narayana Superspeciality Hospital Katra between 1st May 2016 and 2nd June 2016 to assess the Knowledge, Attitude and Practice of Hospital Infection control

2.9. OBJECTIVES

- To organize the process flow of Hospital Infection control with a special focus on Biomedical waste in a new hospital start up
- To assess the knowledge, attitude & practise of proper waste disposal in hospital staff personnel.
- To organize the process flow of Bio-medical waste from Segregation to disposal.
- Active education, training & supervision of members of the health care team on aspects related to hospital infection control.

2.9.1 RESEARCH METHODOLOGY

- **Study Design:** Experimental Pre test post test control group design
- **Study Area** : Shri Mata Vaishno Devi Narayana Superspeciality Hospital, Katra
- **Sample Size** : 100 which include 50 Housekeeping staff and 50 nursing staff personnel.
Two Groups taken –Experimental group and Control Group
Of 50 Housekeeping staff-25 were randomly assigned to experimental group and 25 assigned to Control group.
Of 50 Nursing Staff-25 were randomly assigned to Experimental group and 25 assigned to Control group
- **Study Period:** 1st May 2016 till 2nd June 2016

2.9.2 MODE OF DATA COLLECTION:

The data is collected through survey questionnaire.

Separate questionnaire was prepared for Housekeeping and Nursing staff.

Questionnaire for housekeeping staff included their awareness level on biomedical waste segregation and disposal –set of 17 questions was prepared

Questionnaire for nursing staff included their awareness level on biomedical waste segregation, Hand washing technique and do's and don'ts for needle stick injury-a set of 18 questions was prepared.

Cases were randomly assigned to experimental and control group.

Program intervention in form of regular training sessions on Hospital infection control including bio-medical waste was carried out.

Post training assessment was carried out in form of survey questionnaire and weekly audit in all departments.

Data collected was analyzed and interpreted.

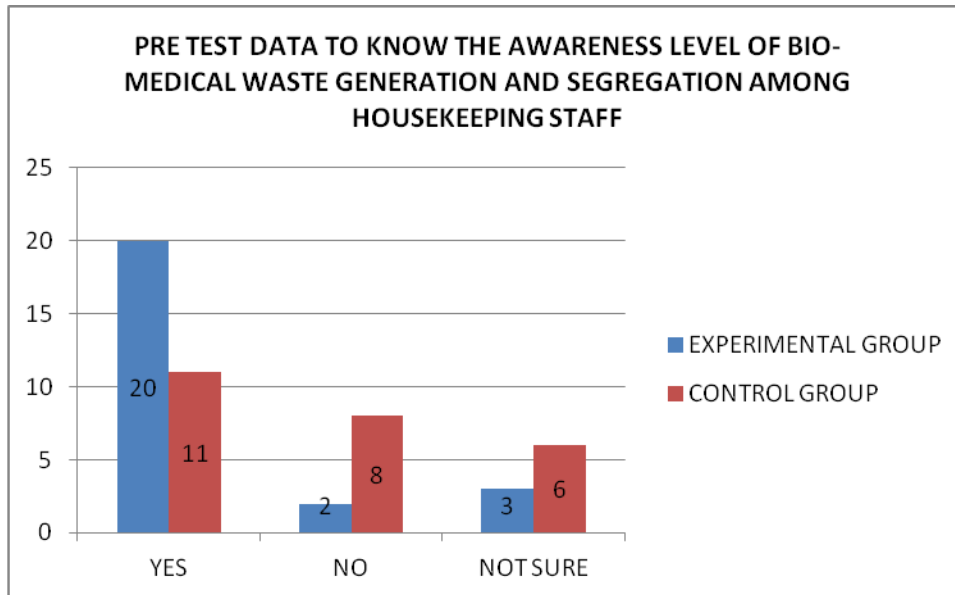
2.9.3 DATA COMPILATION AND ANALYSIS

2.9.3.1. Knowledge about Bio-Medical Waste Generation and Segregation

It is basically to know the awareness level about bio-medical waste generation and segregation.

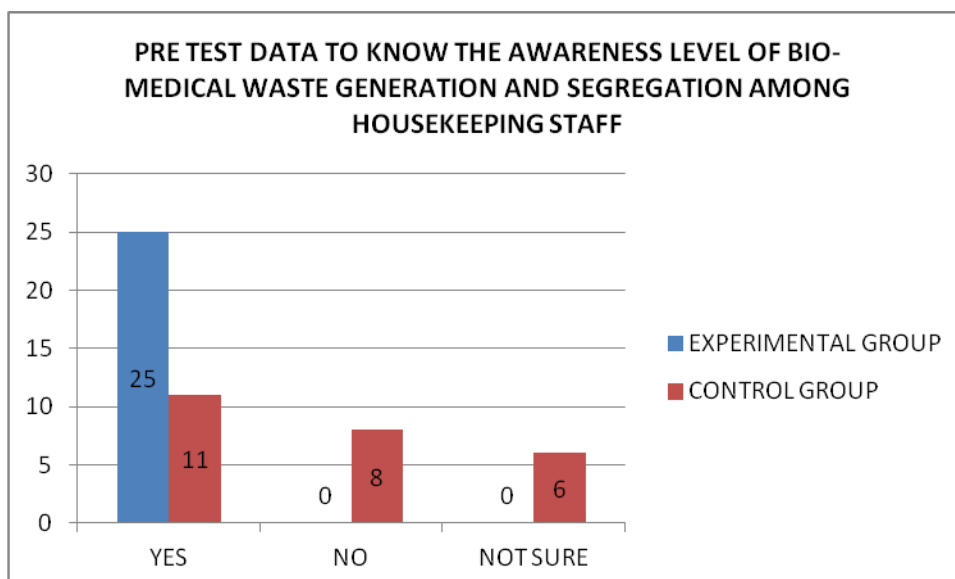
2.9.3.2. Pre Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	20	2	3
CONTROL GROUP	11	8	6



2.9.3.3. Post Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	25	0	0
CONTROL GROUP	11	8	6

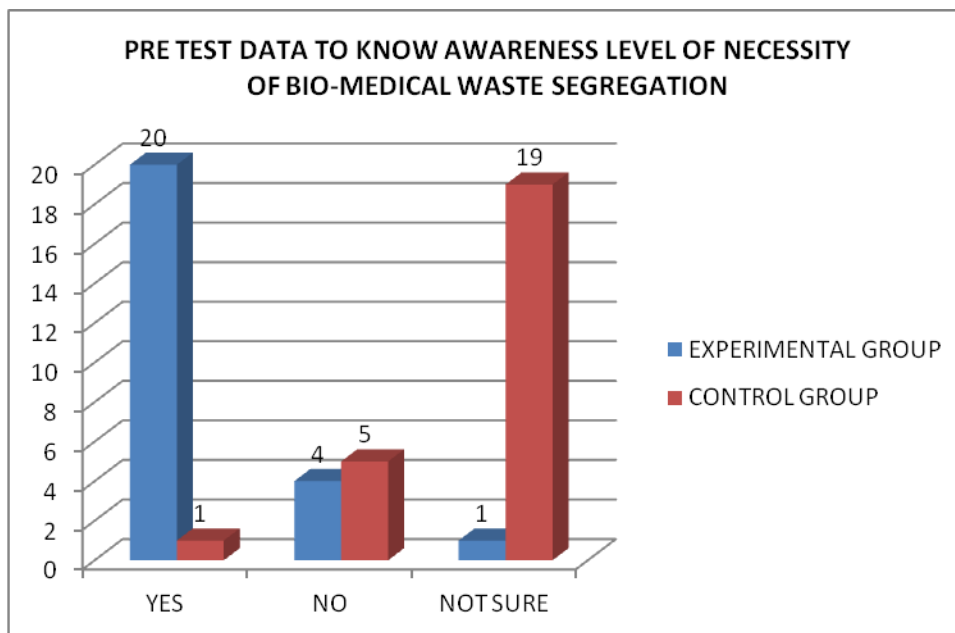


2.9.3.4 Knowledge about necessity of Bio-medical waste segregation

It is basically to know the awareness level of necessity of Bio-medical waste segregation

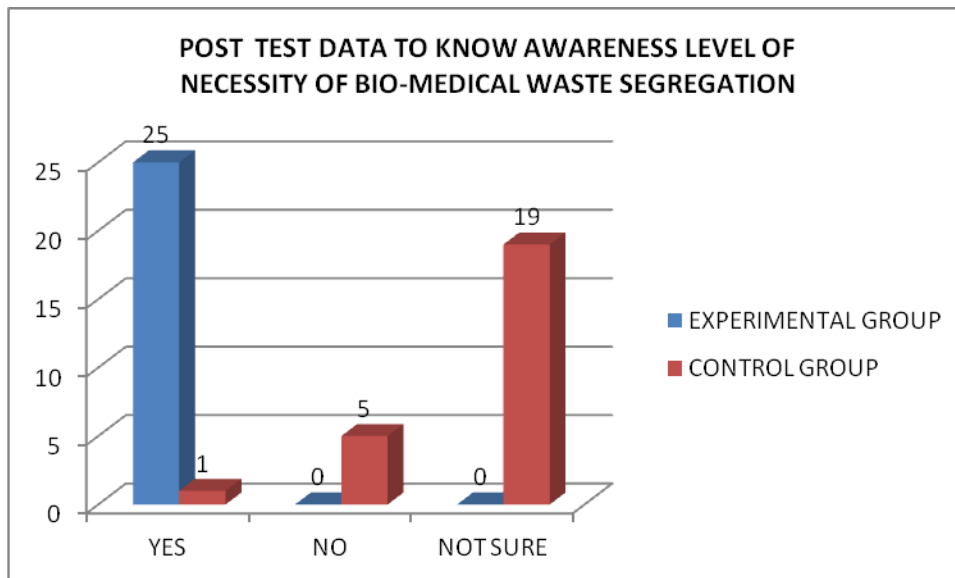
2.9.3.5. Pre Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	20	4	1
CONTROL GROUP	1	5	19



2.9.3.5. Post Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	20	4	1
CONTROL GROUP	1	5	19

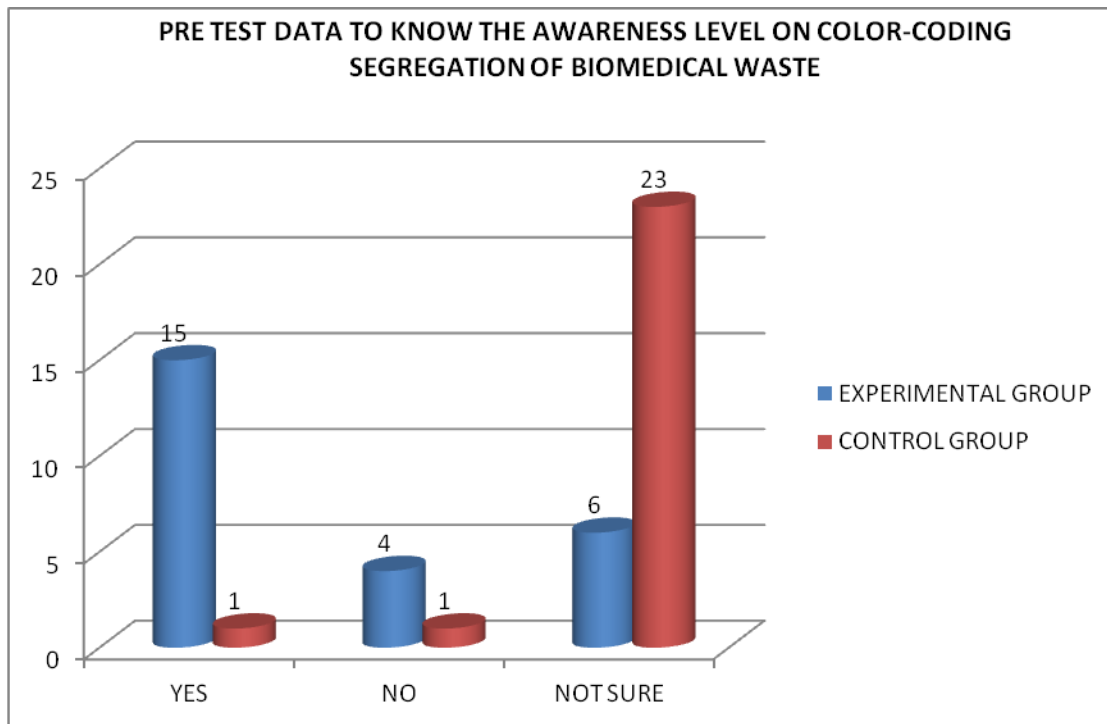


2.9.3.6 Knowledge about Color-coding segregation of Bio-medical waste

It is basically to know the awareness level of Color-coding segregation of Bio-medical waste

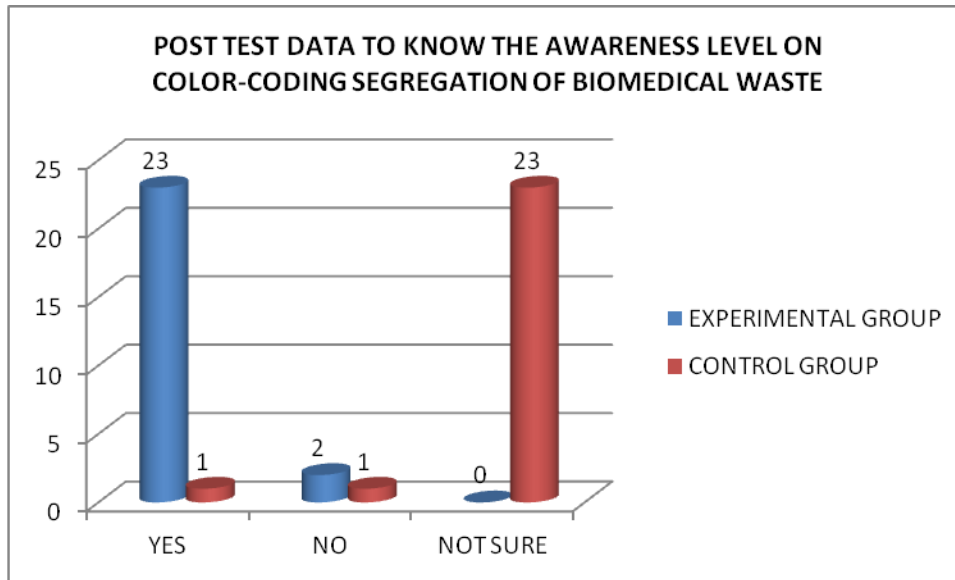
2.9.3.6.1 Pre Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	15	4	6
CONTROL GROUP	1	1	23



2.9.3.6.2. Post Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	23	2	0
CONTROL GROUP	1	1	23



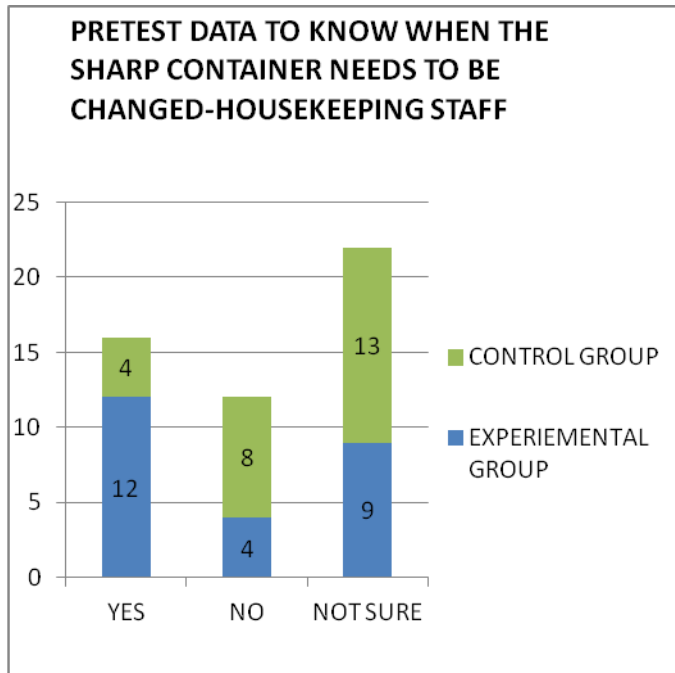
2.9.3.7 Knowledge about when the Sharp container needs to be changed

It is basically to know the awareness level for when the sharp container needs to be changed.

Correct response as per guidelines by Ministry of Health and Environment 2016 is when the sharp container gets 2/3rd filled it is to be changed

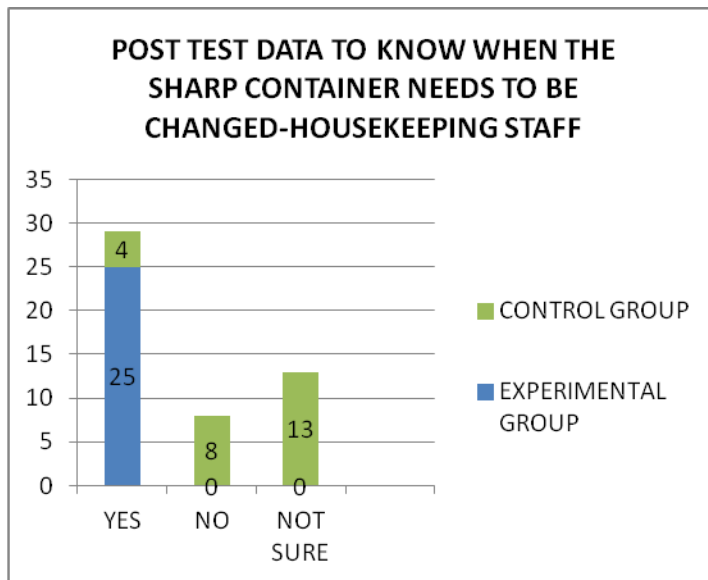
2.9.3.7.1 Pre Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	12	4	9
CONTROL GROUP	4	8	13



2.9.3.7.2 . Post Test data

	YES	NO	NOT SURE
EXPERIMENTAL GROUP	25	0	0
CONTROL GROUP	4	8	13



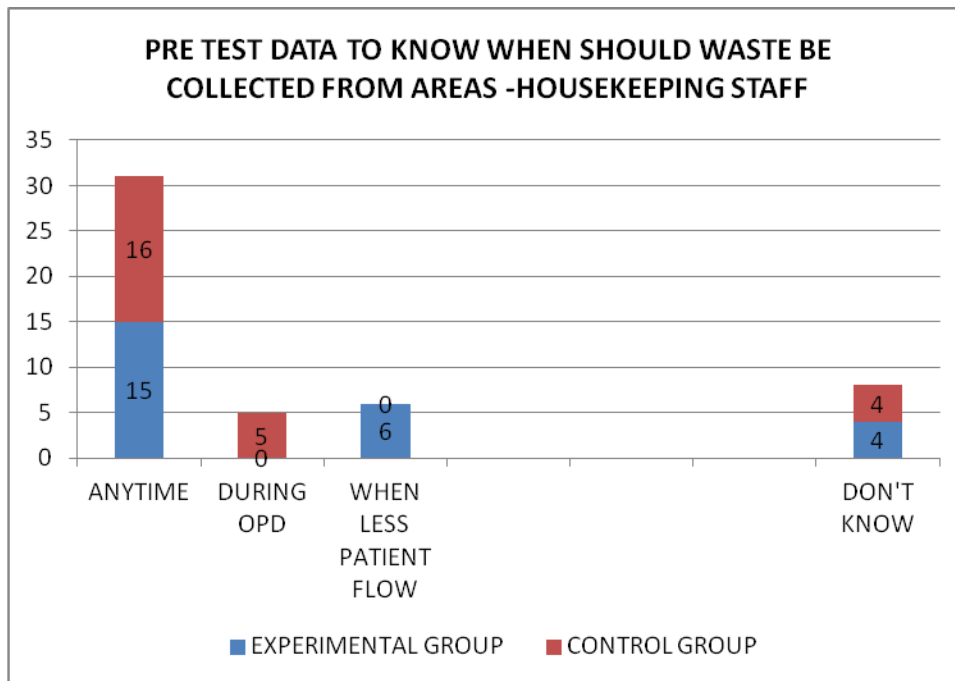
2.9.3.8. Knowledge about when bio-medical waste should be collected from areas

It is basically to know the awareness level and attitude of Housekeeping staff to know when the waste should be collected from areas.

Correct response is waste should only be collected either during early morning or late evening when the patient flow is less and should be transported through Ramp to prevent spread of infection.

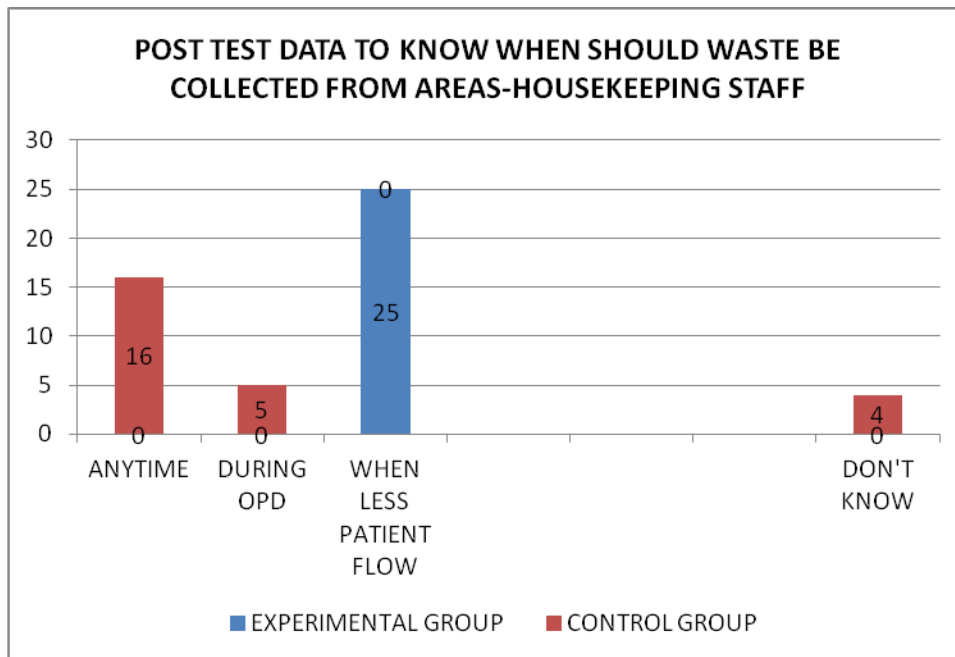
2.9.3.8.1. Pre Test data

	ANYTIME	DURING OPD HOURS	DURING EARLY MORNING OR LATE EVENING WHEN PATIENT FLOW IS LESS	DON'T KNOW
EXPERIEMNTAL GROUP	15	0	6	4
CONTROL GROUP	16	5	0	4



2.9.3.8.2. Post Test data

	ANYTIME	DURING OPD HOURS	DURING EARLY MORNING OR LATE EVENING WHEN PATIENT FLOW IS LESS	DON'T KNOW
EXPERIMENTAL GROUP	0	0	25	0
CONTROL GROUP	16	5	0	4



2.10. INTERPRETATIONS

- Remarkable difference in experimental and control group was noted in knowledge and awareness of housekeeping and nursing staff on hospital infection
- Practicing the Hospital infection control norms is as important as having knowledge and attitude.

2.11. RECOMMENDATIONS

- Regular training sessions are necessary to keep the staff updated about Hospital infection control norms
- Weekly Audits for Biomedical waste Segregation and Waste transportation should be made a protocol.

ANNEXURE

1. Contribution was made in getting the awareness poster approved and implemented with regards to Bio-medical waste segregation and disposal, hand hygiene technique, 5 Moments of hand hygiene, Hand scrub and Needle Stick Injury. Approved Copies are attached herewith:



Shri Mata Vaishno Devi Narayana
Superspeciality Hospital



Managed by Narayana Health

Biomedical Waste Management

“Do not mix hospital waste – follow the colour code below”
Ensure segregation at the point of generation of waste



Biomedical Waste Management

Infectious Waste

- Cotton, gauze and dressing
- Plasters, bandages and diapers
- Mouth Mask, head cap & Shoe covers
- Disposable drapes and disposable gowns
- Body parts and human tissues
- Microbiology & Biotechnology waste
- Expired or discarded medicines
- Blood bags

Contaminated Waste

- Tubings
- Empty syringes without needles
- Vacutainers with their needles cut
- Latex glove, hand care glove & plastic apron
- Empty plastic IV bottles & IV tubes & sets
- Catheters and empty urine bags

Sharps

- Needles from needle tip cutter,
- Scalpels and blades
- Syringes with fixed needles.
- Broken Glass Vials and tubes

General Waste

- (non-infectious)**
- Dry waste, Flowers, Office waste, Papers
 - Food waste, Kitchen waste

- Unbroken or discarded & contaminated glass
- Medicine vials & ampoules except contaminated with cytotoxic waste
- Metallic Body Implants

Bins lined with yellow plastic bags



Bins lined with red plastic bags



Puncture proof container

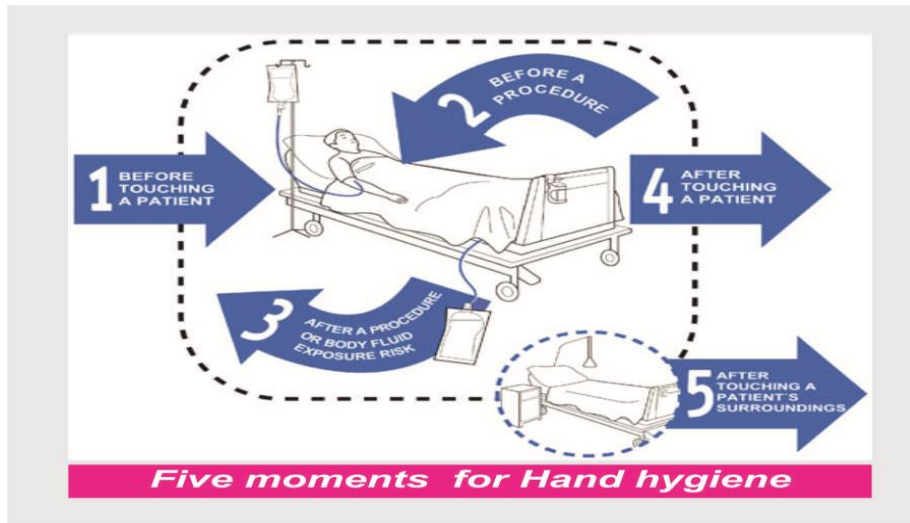


Bins lined with dry & wet black plastic bags



Designated Blue Cardboard container





STEPS OF HANDWASHING

1. Wet hands with water
2. Apply sufficient soap to cover the surfaces of both hands.
3. Follow the steps given below:



Hand to Palm



Back to Palm (both sides)



Interlace (in between web space)



Back of Fingure on Palm
(both the sides)



Thumb
(Rotational rubbing both sides)



Scrub your nail on palms
(bothsides)



Note:-

- Handwashing (rather than using alcohol hand rub) is to be performed when hands are visibly contaminated & after removing gloves.
- Duration of Hand washing(40-60 seconds)
- Open the tap, wet your hands & apply hand wash
- Dry the hands with sterile paper towel
- Close the tap by elbow or with paper towel
- Moments of hand hygiene to be followed



Shri Mata Vaishno Devi Narayana
Superspeciality Hospital



Managed by Narayana Health

SURGICAL HAND SCRUBBING PROCEDURE

Antiseptic solution to be used:
7.5% w/v povidone iodine or 4% w/v chlorhexidine

STEP : 1	Remove all rings, watches and jewellery. Wet hands with water. Apply recommended amount of antiseptic solution onto the hand (press the dispenser three times – 6ml will be the quantity dispensed in total). Use the antiseptic solution to wash hands and forearms thoroughly.
STEP : 2	Apply antiseptic solution again and spread over hands and forearms.
STEP : 3	Clean the hands again paying particular attention to finger tips.
STEP : 4	Thoroughly cleanse nails, fingers, interdigital spaces, palms and back of hands. Wash each finger as if it has four sides.
STEP : 5	Scrub the wrists.
STEP : 6	Once wrists have been scrubbed, scrub the forearm, being sure to move from forearm towards elbow. Repeat the same process with the other forearm.
STEP : 7	Thoroughly rinse hands and forearms being sure to hold hands higher than elbows.
STEP : 8	Allow excess water to drip off at elbows. Dry with a sterile absorbent towel. The overall time taken for performing the surgical scrub is 3-5 minutes.



Shri Mata Vaishno Devi Narayana

Superspeciality Hospital

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NEEDLE STICK INJURY (NSI)



AVOID NSI	AFTER NSI
A Always discard sharps in puncture proof container. Dispose it off, when 2/3rd full V Vaccination against HBV. O Observe universal precaution. I Immediately dispose off sharps after use. D Don't ever recap a used needle or sharp.	Do's - Wash with soap & water. - Inform your supervisor - Report to emergency department, infection control department - Fill the incident report form Don't - Do not PANIC - Do not squeeze the injured area. - Do not put the injured area in mouth. - Do not use alcohol/ betadine.

2. PRE & POST ASSESSMENT QUESTIONNAIRE FOR NURSING STAFF REGARDING BIOMEDICAL WASTE MANAGEMENT

Employee ID:

Name:

Age:

Gender:

QUESTION	YES	NO	NOT SURE
Do You Know about Biomedical Waste generation and Waste Segregation?			
Do you think that biomedical waste Segregation is necessary?			
Do you know about colour-coding segregation of biomedical waste?			
Do you follow colour-coding for biomedical waste?			

- What all colours are there which should be followed?

- According to Biomedical waste (Management and handling) rules, waste should not be stored beyond
 - a) 12 hours
 - b) 24 hours
 - c) 48 hours
 - d) 72 hours

- Do you know when the sharp container needs to be changed?
 - a) Once fully filled
 - b) Once 2/3rd filled
 - c) Can be changed anytime
 - d) Don't Know

- Objects that may be capable of causing punctures or cuts, that may have been exposed to blood or body fluids including scalpels, needles, glass ampoules, test tubes and slides are considered Biomedical waste. How should these objects be disposed off?
 - a) Black Bags
 - b) Yellow bags
 - c) Blue bags
 - d) Puncture proof sharp container

- The colour-code for Biomedical waste to be autoclaved, disinfected is
 - a) Black
 - b) Blue
 - c) Yellow
 - d) Red

- Blood stained Linen will go in which bag?
 - a) Orange Bag
 - b) Yellow Bag
 - c) Green Bag
 - d) Black bag

- Laboratory Culture waste will go in which bag?
 - a) Yellow Bag
 - b) Black Bag
 - c) Blue Bag
 - d) Orange bag

- Where do you dispose cotton, gauze and other items contaminated by blood?
 - a) Yellow Bag

- b) Blue Plastic bag
 - c) Orange Bag
 - d) Black bag
- Cytotoxic drugs are discarded in
 - a) Black bag
 - b) Yellow bag
 - c) Blue bag
 - d) Orange bag
 - Human Anatomical waste should be discarded in which bag?
 - a) Yellow bag
 - b) Black bag
 - c) Blue bag
 - d) Orange bag
 - Sharp Container is filled with
 - a) 7.5% w/v Povidone iodine
 - b) 7.5% w/v Chlorhexidene
 - c) 1% Sodium Hypochlorite
 - d) Anything can be used

QUESTION	YES	NO	DON'T KNOW
• Is needle-stick injury a concern?			
• Should the used needle be re-capped?			
• After Needle stick injury, should the injured area be squeezed?			

3. PRE & POST ASSESSMENT QUESTIONNAIRE FOR HOUSEKEEPING STAFF REGARDING BIOMEDICAL WASTE MANAGEMENT

Employee ID:

Name:

Age:

Gender:

QUESTION	YES	NO	NOT SURE
• Do You Know about Biomedical Waste generation and Waste Segregation?			

• Do you know that biomedical waste Segregation is necessary?			
• Do you know about colour-coding segregation of biomedical waste?			
• Do you follow colour-coding for biomedical waste?			
• Do you know when the container needs to be changed?			

- What all colours are there which should be followed?

- Where Sharps are to be collected?

A) Yellow Bag

B) Black Bag

C) Puncture Proof Container

D) Red bag

- Plastic waste to be collected in

a) Yellow Bag

b) Black Bag

c) Blue Bag

d) Red Bag

- Blood stained Linen will go in which bag?

a) Orange Bag

b) Yellow Bag

c) Green Bag

d) Black Bag

- Laboratory Culture waste will go in which bag?

a) Yellow Bag

b) Black Bag

c) Blue Bag

d) Orange Bag

- Where do you dispose cotton, gauze and other items contaminated by blood?
 - a) Yellow Bag
 - b) Blue Plastic bag
 - c) Orange Bag
 - d) Green bag
- When should you collect waste from areas?
 - a) Anytime
 - b) During OPD hours
 - c) During evening or early morning when patients are less.
 - d) Don't know

QUESTION	YES	NO	NOT SURE
• Can you pick up the bag by placing hand under the bag?			
• Do you know where waste disposal area in this hospital is?			
• Do you know how to transport waste from areas to waste disposal area?			

- Plastic waste is to be disposed through
 - a) Autoclave
 - b) Shredder
 - c) Incinerator
 - d) Don't know
- What is the maximum time limit for which Biomedical waste can be stored?
 - a) 24 Hours
 - b) 48 Hours
 - c) 72 Hours
 - d) No limit