

Summer Internship
In

Aditya Birla Memorial Hospital, Pune

(April 3-June 3, 2015)

A Report

Submitted by

Dr. Abhishek Rai

MBA in Hospital & Health Management
2013-2014



Institute of Health Management Research, Jaipur

CERTIFICATE

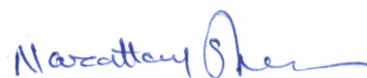
This is to certify Dr. Abhishek Rai has undergone his Summer Training **Aditya Birla Memorial Hospital, Pune** from 3rd April 2015 to 31th May 2015. The candidate himself carried out all the studies related to his Summer Training. His approach to the study has been scientific and analytical.

The summer training is in partial fulfilment of the course requirement recommended for the award of Master in Business Administration-Hospital & Health Management.

I wish him success in all his future endeavours.



Col. (Dr.) Ashok Kaushik,
Dean (Academic and Student Affairs)
IIHMR University, Jaipur



Mr. Narottam Das Sharma
Assistant Professor
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1st Jun'15

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Abhishek Kumar Rai**, student of **Institute of Health Management Research, (IIHMR), Jaipur** has completed his Summer Training in **Operations Department** at Aditya Birla memorial Hospital, Pune from **3rd April 2015 to 30th May 2015**.

For **Aditya Birla Health Services Limited**,

Rajesh Chandra Dubey

Mr. Rajesh Dubey

Operations Department

Shilpa Bhalgat

Dr. Shilpa Bhalgat

Human resource Department



ADITYA BIRLA HEALTH SERVICES LIMITED

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I respect & thank **Ms. Rekha Dubey, CEO of ABMH**, for giving me an opportunity to do the summer internship and for the kind cooperation and encouragement which helped me in developing project.

The guidance and support received from **Mr. Rajesh Chandra Dubey (Senior Manager Operations and Quality)** and **Mr. Chandrakant Bhosale (Assistant Manager, Operations Department)** ABMH, whose contribution to this project was vital for the success of project. I am grateful for their constant support and help.

I am obliged to all the HODs and staff members for the valuable information provided by them in their respective fields. I am grateful for their cooperation during the period of my assignment.

I also show my gratitude to all hospital staff who contributed in one way or the other in the course of the projects.

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ACRONYMS/ ABBREVIATIONS

- ABMH- Aditya Birla Memorial Hospital
- A & E- Accident and Emergency
- BME- Biomedical Engineering
- COO- Chief Operating Officer
- CT- Computed Tomography
- CSSD- Central Sterility Store Department
- HACCP- Hazard Analysis and Critical Centre Point
- HR- Human Resource
- HIS- Hospital Information System
- IPD- In Patient Department
- ISO- International Organization for Standardization
- JCI- Joint Commission International
- NABH- National Accreditation Boards for Hospitals
- OPD- Out Patient Department
- ICD-International Classification of Disease
- IQR-Inpatient Quality Reporting
- HAI-Healthcare Associated Infection
- BMW-Biomedical Waste Management
- CBWTF-Common Biomedical Waste Management Treatment facility
- HCE-Health Care Establishment
- PCMC- Pimpri Chinchwad Municipal Corporation
- MPCB-Maharashtra Pollution Control Board
- MICU-Medical Intensive Care Unit
- PICU-Paediatric Intensive Care Unit
- CCU-Critical Care Unit
- HDU-High Dependency Unit
- SICU-Surgical Intensive Care Unit
- CVTSR & OT-Cardiovascular Terminate and Stay Resident & Operation Theatre
- NICU-Neonatal Intensive Care Unit

About ABMH

Aditya Birla Memorial Hospital (ABMH) is a multi-specialty medical centre located at Pimpri-Chinchwad, Pune. The quaternary healthcare centre provides high quality and cost-effective medical services. A tribute to the visionary founder of the Aditya Birla Group, the hospital fulfils the late Mr. Aditya Vikram Birla's dream of building a world-class healthcare facility in India. It is the first and only hospital in Pune to have coveted JCI (Joint Commission International) accreditation in addition to NABH, ISSO and NABL accreditation. It is a 500 bedded hospital with which was incorporated in the year 2006. It is a private limited organization and Mrs. Rajashree Birla, chairperson of the Aditya Birla Foundation, is personally steering this project. Oncology centre is one of its major milestones of expansion.

Vision:

Excellence first and always

Mission:

Compassionate quality healthcare

- ☐ The hospital is committed to maintain the highest standard of care and respond to the needs of the community in a compassionate manner.
- ☐ To provide state-of-the-art, high quality and cost-effective healthcare services and latest information to improve and maintain health for the well-being of the community.
- ☐ To unrelentingly pursue the creation of value for our customers, shareholders, employees and society at large.
- ☐ To foster a therapeutic relationship based on compassion that is felt, quality that is measurable and cost that is affordable.
- ☐ To become partners in health promotion with every section of society.

□ Super specialty services

Cardiology and Cardiovascular	Pain Management
thoracic surgery	
Neurology and Neurosurgery	Oncology
Orthopaedics & Joint Replacement	Haematology
Gastroenterology	Internal medicine
Minimal Invasive Surgery	Endocrinology
General surgery	Accident and Emergency
Paediatrics & Neonatology	Physiotherapy
Obstetrics and Gynaecology	Radiology
Infertility Clinic	
Intensive Care	Bone Marrow Transplant Unit
Dietetics	Transfusion Medicine
Nephrology	Plastic surgery
Urology	Dentistry
Ophthalmology	Pulmology
Telemedicine	Preventive Medicine
ENT	Pathology
Blood Bank	Rheumatology

The hospital is constructed in a plot size of 53,000 square meters and the covered area of the building is 35,820 square meters. There are three buildings in the hospital one for OPD and one for IPD which are joined by atrium in the centre and a separate building for Oncology. In the OPD building there is ground plus 2 floors where as in IPD building there is basement plus ground plus 4 floors and oncology building has 5 floors. There is a single basement which is having non-clinical departments like laundry, finance, HR, CSSD, Mortuary, Store and purchase etc. in the IPD building. Parking space is well organized with staff parking at the basement with a space of 4,000 square meters and a separate paid parking, with a space of 6,000 square meters is provided for patients with in the hospital premises. There are 14 lifts in the hospital with a capacity of 26 people in each lift. Number of stair cases are 4 and there is one ramp for material access. Other amenities like cafeteria, coffee vending shop, stationary shop, garment shop, photocopy shop; ATM and Idol of Lord Ganesha are present in the atrium. Aditya Birla Memorial Hospital is a quaternary health care centre with 18 specialties.

It has got numerous accreditations like JCI (Joint Commission International), NABH (National Accreditation Board for Hospitals), ISSO, NABL (National Accreditation Board for Laboratories). There are a total of 500 beds in the hospital with around 350 functional beds. Wards are broadly divided into Gold Male, Gold Female, Gold paediatric, Gold plus, Platinum, Emerald, Ruby Deluxe, Sapphire and Diamond suits with different bed charges, consultant, nursing charges etc. Few departments are out sourced like laundry, housekeeping, security, engineering, canteen etc. in which only man power is outsourced but the infrastructure is provided by the hospital

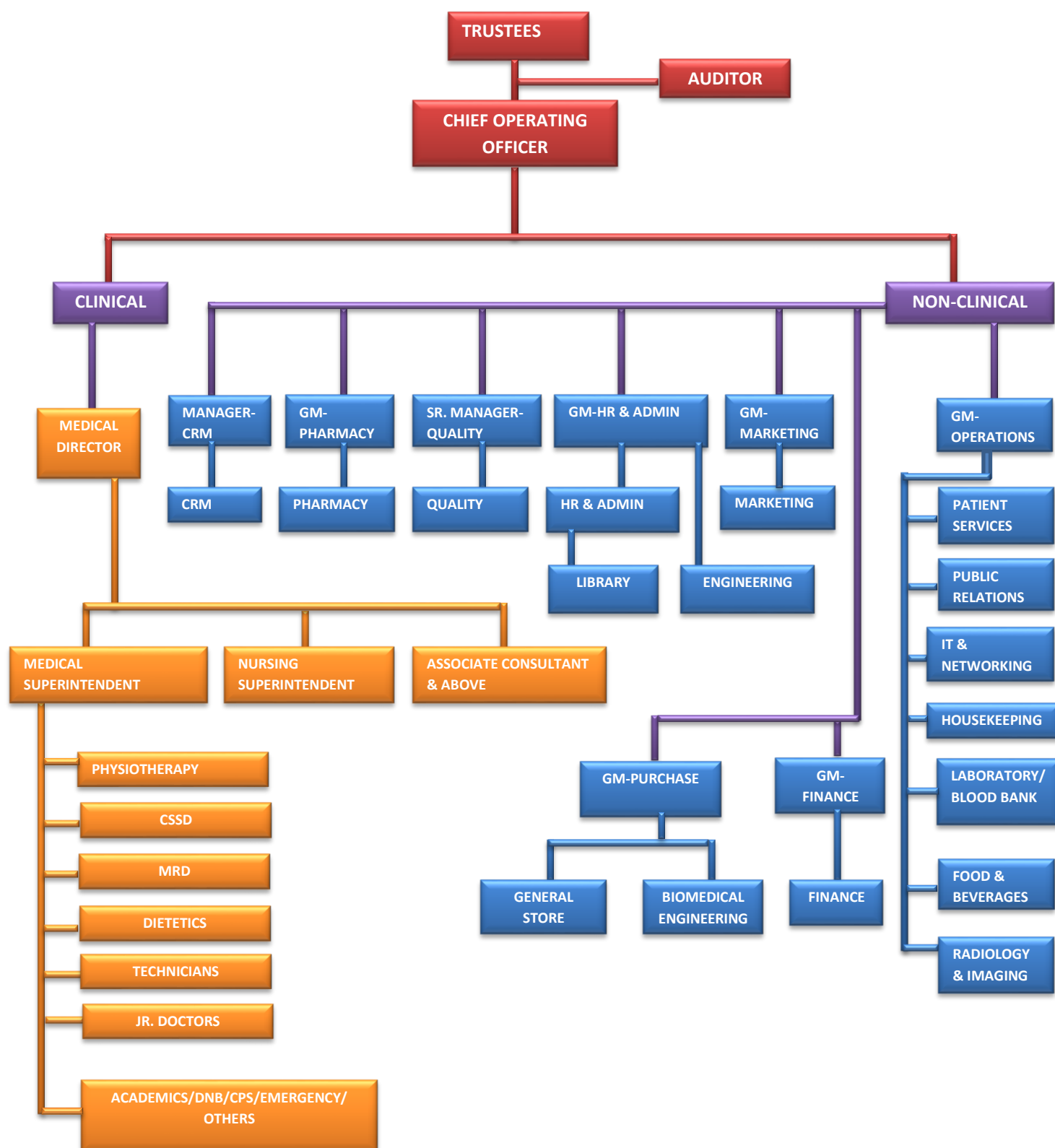
QUALITY POLICY

- At Aditya Birla Memorial Hospital, a multi super speciality institute, are committed to serve our users and society at large.
- Our endeavour is to achieve utmost satisfaction of our users by delivering compassionate, affordable quality services on a sustainable basis. Our focus is on continuous improved patient care, aligning ourselves with technological advances in medical field.
- All efforts are made, and will continue to be made, to put medical practices in place to comply with National and International Standards like ISO, NABH, NABL and JCI to maintain excellence.
- We are committed to abide by ethical codes of practices and are responsive to the safety, Welfare and needs of all our stakeholders.

Awards and Achievements



ORGANOGRAM OF ADITYA BIRLA MEMORIAL HOSPITAL



AN AUDIT REPORT TO STUDY THE CURRENT HOSPITAL REPORTING SYSTEM AND TO PROVIDE SUGGESTIONS RESEARCH QUESTIONS

Is the current reporting system of hospital satisfactory and to find out the gaps if not satisfactory?

INTRODUCTION

Hospital reporting system defines the standards for collecting financial and statistical data related to the day-to-day operation of the hospital. Every department maintains reports related to its functioning. These reports are generated either manually or through system and after authorisation these reports are sent to various destinations either through mail or by hand/courier.

Hospitals are required to report both internally as well as externally. Internally departments report to:

- Other departments
- Head of the department
- Top level managers

Externally departments reports to:

- Government bodies
- Accreditation bodies
- Higher management

Reliable and timely information, obtained from a wide range of sources, is a prerequisite to support the systemic planning and management of hospital system. Accurate, relevant and up to date information is essential to hospital managers if they are to recognize weakness in hospital services. And take action that will improve service delivery.

OBJECTIVES

- To determine the current reporting system of the hospital.
- To provide suggestions and recommendation.

NEED FOR STUDY

The reports generated by each department are different with different formats. There is no proper standard that the department has to follow while generating or submitting the reports. This leads to:

- Lack of continuity
- Lack of comparable statistical data
- Limitations for analysis.

Proper reporting standard in a hospital will lead to:

- Ability to benchmark against peers based on indicator tools and provincial feedback reports
- Demonstrate efficiencies and effectiveness of services
- Implement efficiencies and best practices in operations and business policies
- More efficient data submission to the external bodies
- Hospital reporting system defines the standards for collecting financial and statistical data related to the day-to-day operation of the hospital.
- Defines rules for data collection and aggregation
- Establishes standard chart of accounts within a consistent reporting framework
- Facilitates the development of performance measurement indicators
- Ensure the coordination and integration of all quality improvement activities across all departments within the Hospital
- Identify and prioritize performance indicators in all clinical, managerial, and technical areas

AREA TAKEN FOR STUDY

All the departments of the hospital

REVIEW OF LITERATURE

The work of an organization must be viewed as a process that is never finished. Any program can always be improved, and must be changed as the needs of the community. Reporting is a valuable mechanism for hospitals and the health system to monitor and track progress against desired outcomes and to meet quality assurance and improving standards for accreditation.

Hospitals measure their performance and use internal data analyses to align decision-making with internal goals and external performance expectations. Collecting and reporting data are critical to measuring hospital performance and assisting with making internal decisions. Measures that are most valuable from the perspectives of the organization and senior management include those linked with quality and safety, and efficiency/financial considerations (e.g., cost per weighted volumes, total margin, current ratio, wait times, readmission rate, and alternative level of care, patient satisfaction, wait times and employee satisfaction/engagement).

Various efforts go into reporting hundreds of measures to the clinical quality commissions, regulators, the General Medical Council, and local governing bodies. The majority of these are measuring the wrong thing, such as mortality measures and the overall performance of hospitals. Yet overall mortality simply is far too limited a measure when the quality of hospital care is concerned.

The reporting framework should be consistent through time to identify long-term trends. The framework should be sufficiently broad to encompass measures that can help identify emerging issues, or areas for improvement.

A range of government agencies report on aspects of patient safety should facilitate information sharing to ensure clarity and consistency of messaging

Joint Commission to provide a uniform set of national hospital quality measures to be implemented in the hospital inpatient setting to promote high quality care for patients receiving services in hospital inpatient settings.

Hospital Reporting Requirements

Measurement specifications

[Data Collection Guide for Emergency Department Transfer Communication Measures](#). A guide to the ED Transfer Communication measures, that aim to provide a means of assessing how well key patient information is communicated from an ED to any health care facility.

[Inpatient specification manual](#). Developed by the Centers for Medicare & Medicaid Services and Joint Commission to provide a uniform set of national hospital quality measures to be implemented in the hospital inpatient setting to promote high quality care for patients receiving services in hospital inpatient settings.

[Outpatient specifications manual](#). Developed by the Centers for Medicare & Medicaid Services (CMS) to provide a uniform set of quality measures to be implemented in hospital outpatient settings to promote high quality care for patients receiving services in hospital outpatient settings.

[AHRQ quality indicators](#). Agency for Healthcare Research and Quality (AHRQ) measures of health care quality that makes use of readily available hospital inpatient administrative data.

[Healthcare Associated Infection \(HAI\)](#). Operational Guidance for Acute Care Hospitals to Report on required CMS Measures for the purpose of fulfilling CMS's Hospital Inpatient Quality Reporting (IQR) Requirements.

Spontaneous reporting is the main tool used to detect errors and adverse events in most countries, and reporting systems are believed to be important for improving patient safety. Collecting and reporting data are critical to measuring hospital performance and assisting with making internal decisions.

RESEARCH METHODOLOGY

STUDY AREA

Aditya Birla Memorial Hospital

STUDY TYPE

Analytical study

DATA COLLECTION

DATA COLLECTION TOOL

MS Excel Sheet was prepared to note down observation

DATA COLLECTION TECHNIQUE

Interaction with Staff

Questioner: format used is shown below:

Department:

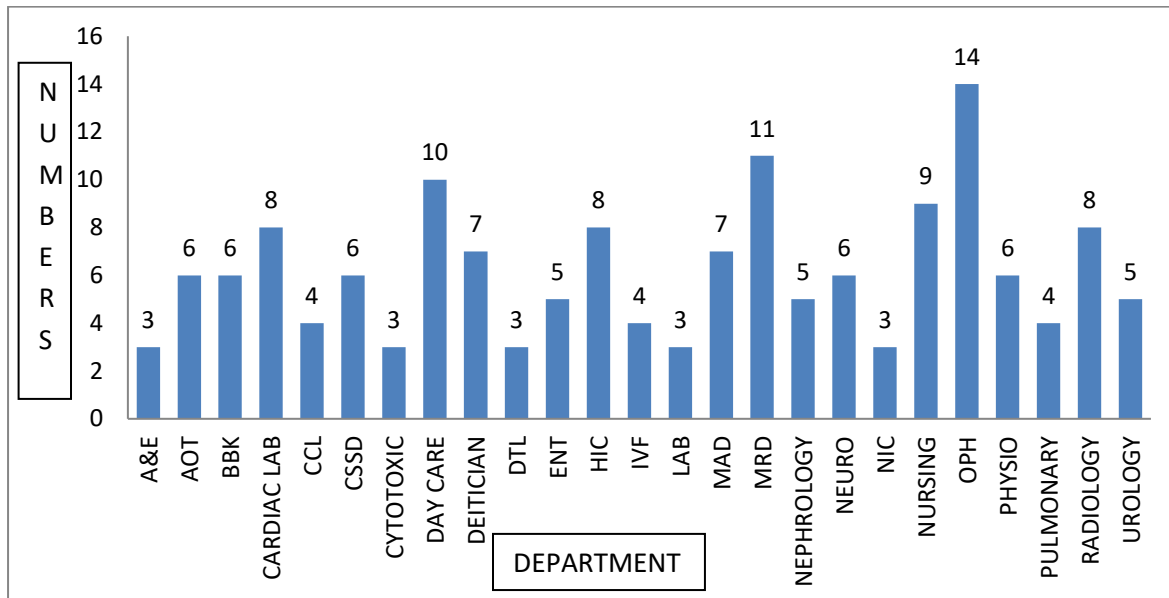
Sr. No.	Report Generated	Data Fields	Source	Method	Duration	Sending to	Authorizatio n	Generated by
01					H / D / W / M / Q / Y ASAP			
02					H / D / W / M / Q / Y ASAP			
03					H / D / W / M / Q / Y ASAP			
04					H / D / W / M / Q / Y ASAP			

ANALYSIS AND INTERPRETATION

Table showing the number of reports produced by each department in the hospital.

DEPARTMENTS	TOTAL
A&E	3
ACCOUNTS	21
AOT	6
BBK	6
BMD	8
CARDIAC LAB	8
CCL	4
CSSD	6
CYTOTOXIC	3
DAY CARE	10
DEITICIAN	7
DTL	3
ENG	10
ENT	5
F&B	13
HIC	8
HK	12
HRD	6
IT	2
IVF	4
LAB	3
LAUNDRY	4
MAD	7
MRD	11
NEPHROLOGY	5
NEURO	6
NIC	3
NURSING	9
OPH	14
PATIENT SER	69
PHARMACY	8
PHYSIO	6
PULMONARY	4
PURCHASE	9
RADIOLOGY	8
TPA-B.O.	4
TPA-F.O.	2
UROLOGY	5
Grand Total	322

Graphical presentation of Reports generated by Clinical departments



Graphical presentation of Reports generated by Non-Clinical departments

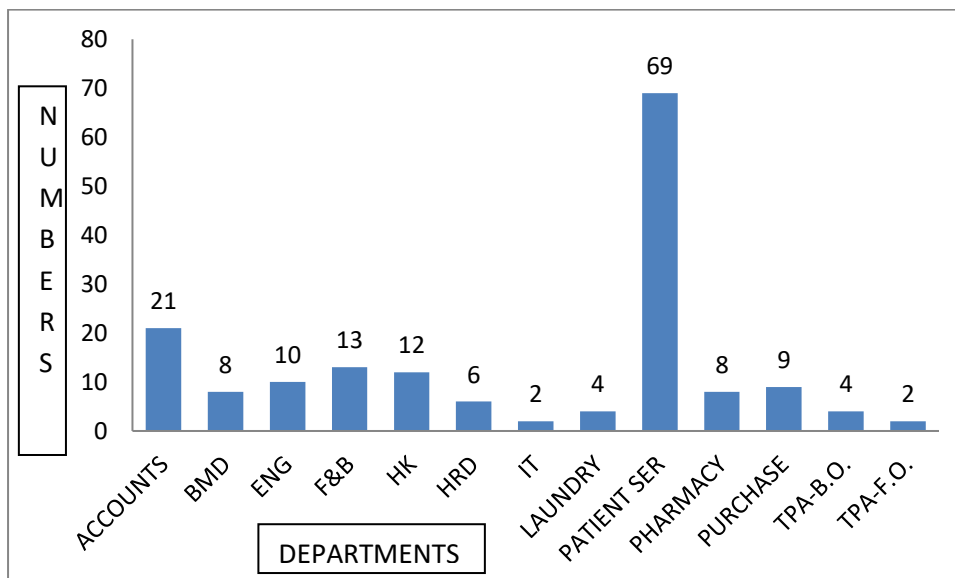


Table showing the number of reports produced by different sources.

SOURCE	REPORTS
MANUALLY	134
MANUALLY+SYSTEM	29
SYSTEM	159
Grand Total	322

Graphical representation showing percentage distribution of manually, system and manually+system generated reports.

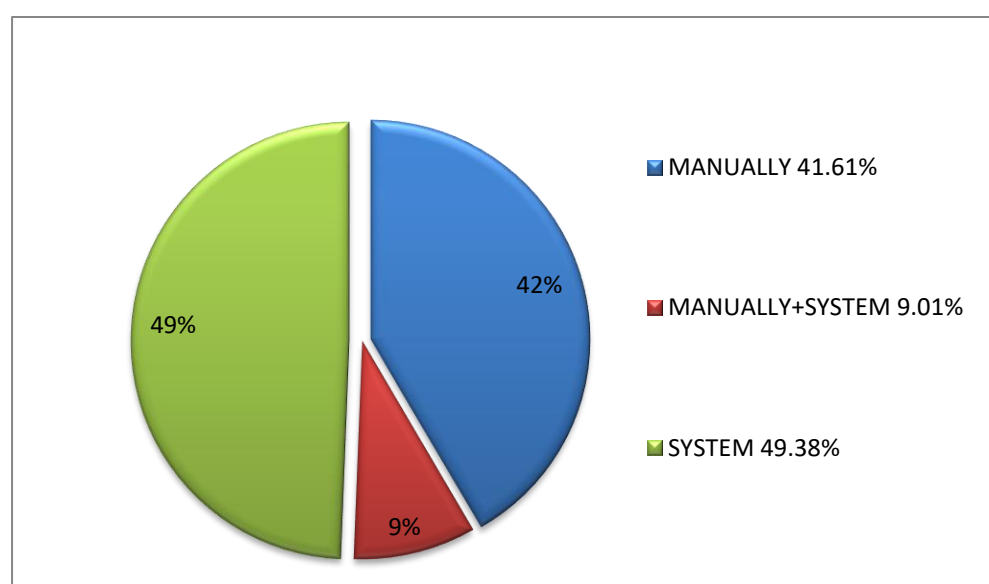


Table showing the total number of reports sent outside (externally) and distributed within the hospital (internally)

EXT/INT	REPORTS
EXTERNAL	14
INTERNAL	308
Grand Total	322

Graphical representation showing percent distribution of reports internally and externally

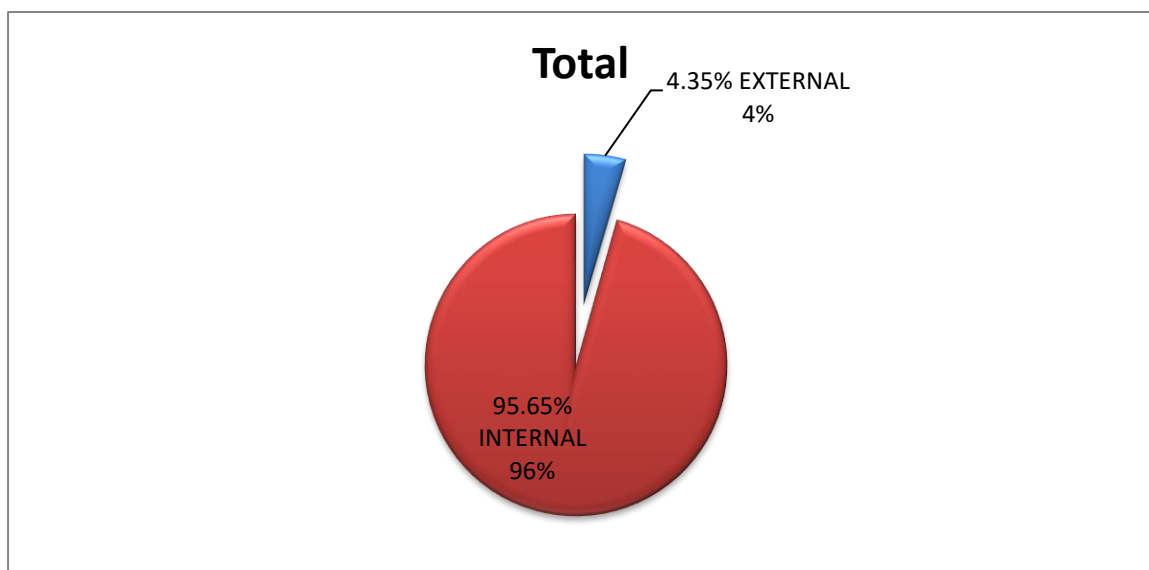
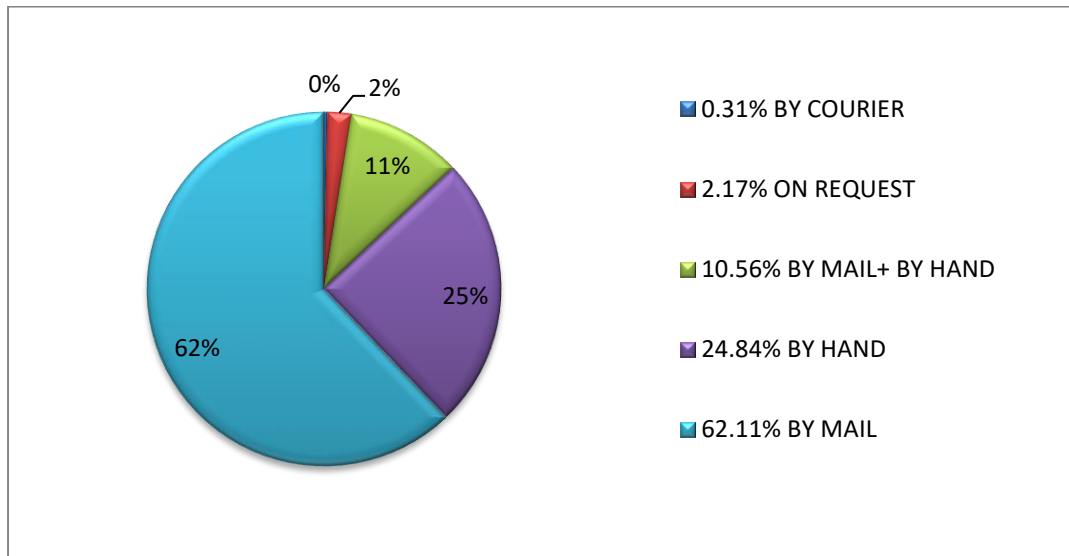


Table showing different types of methods used to send reports.

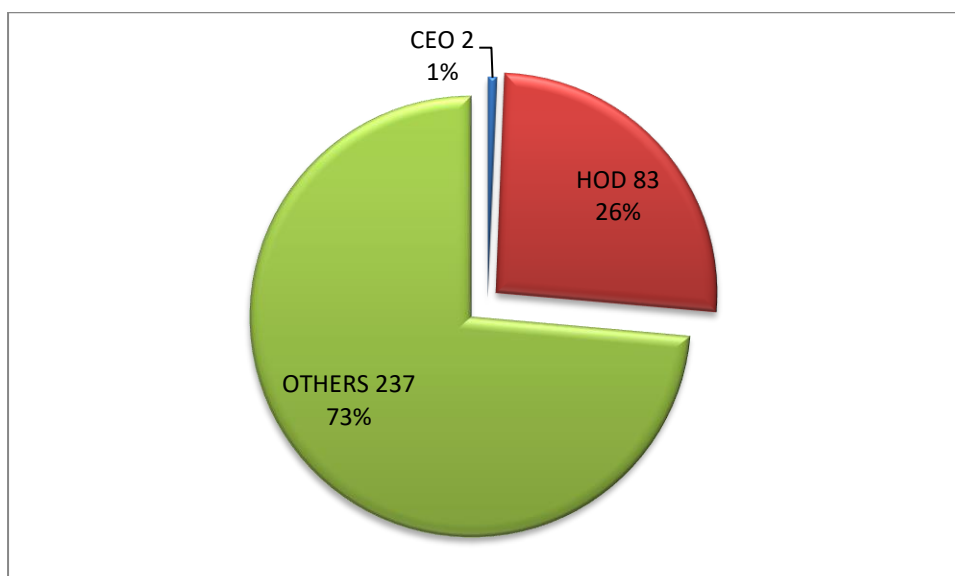
METHOD	REPORTS
BY COURIER	1
BY HAND	80
BY MAIL	200
BY MAIL+ BY HAND	34
ON REQUEST	7
Grand Total	322

Graphical representation of the percentage distribution of methods by which reports are sent outside.



While doing this study it was found that most of the report which are sent outside the hospital to government bodies are sent by hand or by courier in a format provided to the hospital but these reports are not sent on a fixed time of the month and hospital don't even keep any receipt or proof of the reports sent. Moreover, these reports are sent to outside without higher authority notification.

Graphical representation of the percentage distribution of reports which are sent outside with higher authority notification.



Only 27% of the reports are sent after HOD's and CEO's authorization. 73% of reports are sent after authorization by nursing staff, technicians, supervisors or department managers. It was also found that important reports like eye bank statistics report, MTP report, PCPNDT reports etc. are sent without informing HOD or CEO.

An audit should be done by higher level managers to know what all reports require higher level manager's authorization so as to avoid future problems.

While doing this study it was found that Patient services department produces maximum report namely OPD reports of various departments, wellness report, quality indicators and Patient feedback reports etc. so critical analysis was done on these reports as shown below:

REPORTS	DATA FIELDS						
Internal medicine OPD	S.no.	First visit	Follow up	Doctor's name	IM/IV injection		
Ophthalmology OPD	S.no.	Doctor's name	First visit	Follow up	Test/treatment		
ENT OPD	Doctor's name	First visit	Follow up	Test			
Dental OPD	Doctor's name	New	First visit	Follow up	Number of procedures	Procedure amount	Total amount
Neurology OPD	Doctor's name	New	First visit	Follow up	Test	Dressing major	Suture removal
Dermatology OPD	S.no.	Doctor's name	First visit	Follow up	Dressing	Procedure	Amount
Paediatric OPD	S.no.	First visit	Follow up	After discharge report	Number of procedures	Amount	
Cardiac OPD	First visit	Follow up	Doctor's name	Test name	Procedure name	Charge	total
Gynaecology OPD	Doctor's name	First visit	Follow up	Test	Procedure		
Physiotherapy OPD	Doctor's name	First visit	Rehab	Therapy			
Ortho OPD	Doctor's name	First visit	Follow up	Dressing	POP removal	wellness	

Here it was found that not all the OPD reports use S.no in their data fields.

These are OPD reports and some of the data fields are common in many reports like S.no. Doctor's name, first visit, follow up, new patient etc. still these data fields do not come in same sequence.

Many OPD reports mention the name of procedure and test but they didn't mention amount or charge in their reports.

To improve this audit should be done by the higher level managers in all the departments to rationalise reporting system.

Following changes could be done in these reports to improve data quality and information collection.

REPORTS	DATA FIELDS								
Internal medicine OPD	S.no	Dr. name	First visit	Follow up	IM/IV injection				
Ophthalmology OPD	S.no	Dr. name	First visit	Follow up	Test/treatment				
ENT OPD	S.no	Dr. name	First visit	Follow up	Test	Amount			
Dental OPD	S.no	Dr. name	New	First visit	Follow up	Number of procedures	Total amount		
Neurology OPD	S.no	Dr. name	New	First visit	Follow up	Test	Dressing major	Suture removal	Amount
Dermatology OPD	S.no	Dr. name	First visit	Follow up	Dressing	Procedure	Amount		
Paediatric OPD	S.no	First visit	Follow up	After discharge report	Number of procedures	Amount			
Cardiac OPD	S.no	Dr. name	First visit	Follow up	Test name	Procedure name	Charge	Total	
Gynaecology OPD	S.no	Dr. name	First visit	Follow up	Test	Procedure	Amount		
Physiotherapy OPD	S.no	Dr. name	First visit	Rehab	Therapy	Amount			
Ortho OPD	S.no	Dr. name	First visit	Follow up	Dressing	POP removal	wellness		

TPA department prepares 4 types of reports namely outstanding TPA report, Dispatch Report, Net details reports and quality indicator. Out of these four reports quality indicator was found to have maximum number of data fields. On analysing quality indicator of TPA department following things were found:

Quality indicator of TPA				
		Important	Necessary	Both
Data Fields	1. S.no.			✓
	2. Invoice number			✓
	3. MRN number			✓
	4. Date of admission	✓		
	5. Invoice date			✓
	6. Patient name	✓		
	7. Party name			✓
	8. TPA ref. no.			
	9. Admitting doctor			
	10. Approval amount			✓
	11. Room allotted			
	12. Bill amount			✓
	13. Outstanding	✓		
	14. POD no.			✓
	15. Dispatch date			✓
	16. Reasons		✓	
	17. Department		✓	

While analysing quality indicator report of TPA it was found that many data fields in the report are neither important nor necessary but still they are entered in the report, while some data fields are only important or only necessary.

It was also found that other reports of TPA department like dispatch report and outstanding TPA report also have same data fields so the same data is being entered on different reports.

So the hospital should conduct an audit to critically analyse these reports so as to prevent redundancy of data and produce reports with more efficient data.

OBSERVATION

- In a common effort all departments are sending reports to HRD, Quality department, CEO and MRD.
- Reports sent outside are sent without higher authority notification.
- Only patient services, pharmacy, purchase and Human resource department are sending reports to Finance department.
- Patient services department produces maximum number of reports.
- Some reports are recommended by the CEO which the departments are maintaining and they don't send it to other departments.
- Monthly reports are usually sent at the end of the month but there is no proper date or time on which the department is supposed to submit the reports.
- Proper format to produce reports are given only for some reports.
- In the existing reporting system many reports are recording data which are not required.

CONCLUSION

On the basis of this study it can be concluded that there is strong need to form a proper reporting standard by the higher level managers so as to improve timeliness of data and report collection.

RECOMMENDATIONS

- On the basis of study an attempt should be made by higher management to designate central authority for improvisation of process to send reports to government/outside bodies.
- All the departments should maintain a quality indicator report.
- There is a need to develop a clear cut timeline for improvements in reporting capabilities.
- An attempt should be made to increase the number of reports generated through system as it will save time.
- Being able to capture and report data and provide an integrated view of information at all levels of the organization, in a timely way, could and should enhance decision-making.
- Centralized, accessible reporting system with one reporting methodology should be used in hospital to enhance and standardize data quality and efficiency.
- Through careful study number of reports has to be reduced. So an audit must be done by the higher level managers so as rationalize their reporting system. Once it is done quality of information and data can be assured.
- Currently around 42% of the reports are produced manually so hospital should understand how these reports are produced and how they can be pushed through system. It can be done by consulting with IT department and making some changes in their HMIS.

REFERENCE

- www.health.state.mn.us/divs/hpsc/dap/hccis/stndrdrpts.htm
- www.oha.com/_layouts/OHAWCM/PdfContainer.aspx?eventid
- https://www.gov.uk/.../20141013_Hospital_Food_Panel_Report_Complete
- www.workopolis.com/jobsearch/ontario-hospital-reporting-standards-jobs
- www.euro.who.int/_data/assets/pdf_file/0009/74718/E82975.pdf
- www.oha.com

A STUDY TO COMPARE CURRENT BIOMEDICAL WASTE MANAGEMENT SYSTEM WITH OLD ONE AND TO PROVIDE SUGGESTIONS TO IMPROVE THE SAME

RESEACRCH QUESTION

Is the current biomedical waste management system satisfactory and to find issues related to it if not satisfactory?

INTRODUCTION

Hospitals and other health care facilities generate a lot of waste which can transmit infections, particularly HIV, Hepatitis B & C and Tetanus, to the people who handle it or come in contact with it. India is no exception to this and it is estimated that there are more than 15,000 small and private hospitals and nursing homes in the country. This is apart from clinics and pathological labs, which also generate sizeable amounts of medical waste.

Bio-medical waste means “any solid and/or liquid waste including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals.

Biomedical waste generated from a number of healthcare units, is imparted necessary treatment to reduce, adverse effects that this waste may pose. Installation of individual treatment facilities by healthcare units requires separate manpower and infrastructure development for proper operation and maintenance of treatment system. A common biomedical waste treatment facility is used for treatment and disposal of BMW. The concept of CBWTF not only addresses cost related problems but also prevents proliferation of treatment Equipments in a city.by running the treatment equipment at CBWTF to its full capacity, the cost of treatment per kilogram gets significantly reduced.

CATEGORIES OF BIOMEDICAL WASTE SCHEDULE – I

WASTE CATEGORY	TYPE OF WASTE	TREATMENT AND DISPOSAL OPTION
Category No. 1	Human Anatomical Waste (Human tissues, organs, body parts)	Incineration / deep burial
Category No. 2	Animal Waste (Animal tissues, organs, body parts, carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals and colleges, discharge from hospitals, animal houses)	Incineration / deep burial
Category No. 3	Microbiology & Biotechnology Waste (Wastes from laboratory cultures, stocks or specimen of live micro organisms or attenuated vaccines, human and animal cell cultures used in research and infectious agents from research and industrial laboratories, wastes from production of biological, toxins and devices used for transfer of cultures)	Local autoclaving/ microwaving / incineration
Category No. 4	Waste Sharps (Needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps)	Disinfecting(chemical treatment/autoclaving/microwaving and mutilation / shredding
Category No. 5	Discarded Medicine and Cytotoxic drugs (Wastes comprising of outdated, contaminated and discarded medicines)	Incineration / destruction and drugs disposal in secured landfills
Category No. 6	Soiled Waste (Items contaminated with body fluids including cotton, dressings, soiled plaster casts, lines, bedding and other materials contaminated with blood.)	Incineration / autoclaving / microwaving
Category No. 7	Solid Waste (Waste generated from disposable items other than the waste sharps such as tubing, catheters, intravenous sets, etc.)	Disinfecting by chemical treatment / autoclaving / microwaving and mutilation / shredding
Category No. 8	Liquid Waste (Waste generated from the laboratory and washing, cleaning, housekeeping and disinfecting activities)	Disinfecting by chemical treatment and discharge into drains
Category No. 9	Incineration Ash (Ash from incineration of any biomedical waste)	Disposal in municipal landfill

Category No.10	Chemical Waste (Chemicals used in production of biological, chemicals used in disinfecting, as insecticides, etc.)	Chemical treatment and discharge into drains for liquids and secured landfill for solids.
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Chemical treatment using at least 1% hypochlorite solution or any other equivalent chemical reagent. It must be ensured that chemical treatment ensures disinfection.

OBJECTIVE

- To determine and compare the current biomedical waste management system with old one.
- To provide suggestions and recommendation.

NEED FOR STUDY

According to bio medical waste rules, 1998 of India “**bio-medical waste**” means any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining there to or in the production or testing of bio medicals.

- ▶ **Hospital waste:** refers to all waste, biological or non-biological, that is discarded and is not intended for further use.
- ▶ **Medical waste:** refers to materials generated as a result of patient diagnoses, treatment, immunization of human beings or animals

Biomedical waste (management & handling) rule 1998, prescribed by The Ministry of Environment and Forests, Government of India, came into force on **20th July 1998**. This rule applies to those who generate, collect, receive, store, dispose, treat or handle bio medical waste in any manner. Thus bio medical waste should be segregated into containers/bags at the point of generation of waste. **Thus Colour Coding** & type of containers used for disposal of waste is come into existence.

The process of biomedical waste management involves segregation, collection, treatment, and disposal. The components of a common biomedical waste treatment and disposal facility [CBWTFs] are autoclave, shredder, compactor, and incinerator for anatomical waste, secured landfill facility, laboratory and vehicles for transportation of wastes. Passco Environmental Solutions Pvt Ltd has been hired by the Pimpri Chinchwad Municipal Corporation (PCMC) to collect dispose of solid waste from various HCEs.

Currently hospital is facing following issues with the local collecting agency regarding:

- Calculation of excess weight and charges.
- Segregation method of red bag.
- BMW is not collected on Sunday but weight is considered as excess and it has been included in calculation.

LITERATURE REVIEW

Maharashtra pollution control board states that:

- Every occupier where required shall set up requisite BMW treatment facilities like incinerator, autoclave, microwave systems or any other state- of -the-art technology for the treatment of waste or ensure requisite treatment of waste at a common waste treatment facility or any other waste treatment facility according to the BMW Rules and approved by MPCB.
- BMW shall not be mixed with other wastes or reused, recycled or sold in any form.
- BMW shall be segregated into containers/bags at the point of generation prior to storage, treatment and disposal
- Notwithstanding anything contained in the motor vehicles Act, 1988 or rules thereunder, BMW shall be transported only in such vehicle as maybe authorised for the purpose by the competent authority as specified by the government.
- No untreated BMW shall be kept stored beyond a period of 48 hours.

There are about 350 hospitals and nearly 1500 dispensaries and clinics under the jurisdiction of the PCMC. These establishments have been generating large quantity of biomedical waste every day. Passco Environmental Solutions Pvt Ltd has been hired by the Pimpri Chinchwad Municipal Corporation (PCMC) to collect dispose of solid waste. According to the director of the company, the daily collection of biodegradable, non-biodegradable and BMW is around 800 Kgs per day in Pimpri Chinchwad.

The charges have been decided at Rs. 5 per bed per day for collection of 75 gm. BMW which is allowed per bed per day. However if a hospital generates more BMW, then, they have to pay Rs. 32.42 per Kg to the PCMC. Three mini-trucks from the company visit hospitals and clinics every day and collect the BMW and transport it to the incinerator.

RESEARCH METHODOLOGY

Study area

Aditya Birla Memorial Hospital

Study type

Comparative study

STUDY POPULATION AND SIZE

Study Population

Nursing and housekeeping staff

Sampling Method:

Simple random sampling

DATA COLLECTION

Data Collection Tool:

MS Excel Sheet was prepared to note down observation

Data Collection Technique:

Primary Data:

Peer Observation
Interaction with Staff

Secondary Data:

Biomedical waste management records

ANALYSIS AND INTERPRETATION

BIOMEDICAL WASTE MANAGEMENT POLICY AT ADITYA BIRLA MEMORIAL HOSPITAL

SEGREGATION OF WASTE AS PER COLOUR-CODING (OLD METHOD)

RED BAG	YELLOW BAG	WALL MOUNTED SHARP CONTAINERS
All plastic items non contaminated and contaminated with blood and body fluids like I.V. bottles, catheters, tubing, syringes, glass bottles, etc.	Items contaminated with blood and body fluids like body parts, human tissues, organs, items contaminated with blood and body fluids like dressings, bandages, plaster cast, contaminated gloves, laboratory waste, and discarded medicine.	Waste sharps like needles, scalpels, surgical blades, glass, broken ampules etc.

SEGREGATION OF WASTE AS PER COLOUR-CODING (NEW METHOD)

BAGS AND TROLLEYS:

INFECTIOUS BAGS

BAGS	CONTENT	EXAMPLE	CATAGORY	TREATMENT
RED	INFECTIOUS PLASTIC/ RUBBER	Contaminated plastic bottles, containers, I.V. sets, rubber catheters.	CATEGORY NO. 7	AUTOCLAVE/SHRED DING/RECYCLE
YELLOW	INFECTIOUS WASTE	Dressings, cotton, soiled casts, human tissues, organs, body parts, blood bags, lab cultures & specimens	CATEGORY NO. 1,2,3,5 AND 6	INCINERATION
WALL MOUNTED CONTAINER	SHARPS	Needles, surgical blades, scalpels	CATEGORY NO.4	LANDFILL
WHITE GLASS CONTAINER	GLASS	Glass pieces	CATEGORY NO.4	RECYCLE

NON INFECTIOUS BAGS

BAGS	CONTENT	EXAMPLE	CATAGORY	TREATMENT
GREEN	NON-INFECTIOUS PLASTIC/RUBBER AND GLASS	Non-infectious plastic bottles, intravenous sets, vials and unbroken glass	-	RECYCLE

TROLLEYS

TROLLEY	BAG	CONTENT
MEDICATION TROLLEY	Red	Contaminated plastic bottles, containers, I.V. sets, rubber catheters.
	Yellow	Dressings, cotton, soiled casts, human tissues, organs, body parts, blood bags, lab cultures & specimens
DRESSING TROLLEY	Red	Contaminated plastic bottles, containers, I.V. sets, rubber catheters.
	Yellow	Dressings, cotton, soiled casts, human tissues, organs, body parts, blood bags, lab cultures & specimens

Note:

Wall mounted sharp containers was placed on each bedside or in between two beds, & replaced when 3/4th filled or in seven days. The container was to be put in white transparent bag and then sent to bio-medical waste storage yard for temporary storage.

Wall mounted containers and glass containers are kept in hypo chloride solution. Needles are cut before putting it in hypo solution.

All sharp materials were given in separate cardboard boxes by putting white barcode sticker.

Glasses were given in a separate cardboard box by putting blue barcode sticker.

Collection

Segregation of waste was done at the source of generation only. Dressing trolley was provided at each floor with two bins red and yellow for proper segregation of waste at the source only. Intensive care unit is provided with colour-coded bags dustbin beside each patient bed for proper segregation at the source of generation only.

Each floor had some dirty utility rooms where big size colour coded dustbin has been placed for centralized collection of biomedical waste from different patient area. From dirty utility room, garbage was removed shift wise and taken to biomedical waste storage yard for further storage.

Transportation

Transportation of waste was done in a covered trolley in identified lift (near MRD), at a specified time i.e. 6am-7am in the morning, 3pm-4pm in the evening and 9pm-10pm in the night. After transportation of waste the lift will be cleaned with disinfectant solution.

Storage

Storage of biomedical waste was done at the biomedical waste storage yard situated away from the hospital building but within the premises, and handed over to outsource company PASSCO Environmental Pvt Ltd collected on daily basis for further treatment and disposal.

Records

Records of biomedical waste generated, collection area wise and handling over to PASSCO will be maintained on daily basis.

Route plan for transportation of biomedical waste from patient area to the central storage yard:

IPD BUILDING

FLOOR	WARD	NUMBER OF DU ROOMS	NUMBER OF CU ROOMS
3 rd floor	Gold male	1	1
	Gold plus, gold paediatric & gold female	1	1
	Emerald A & B	2	2
	Platinum A & B	1	1
	Laboratory	1	1
2 nd floor	MICU	1	1
	Dialysis	1	1
	PICU	1	1
	Platinum	1	1
	Diamond & Sapphire	1	1
	CCU	1	1
	HDU	1	1
	Transplant	1	1
	SICU	2	2
1 st floor	CVTSR & OT		
	Cath lab	1	1
	SICU	1	1
	Daycare	1	1
Ground floor	Obstetrics and gynaecology and OT	2	2
	NICU	1	1
	Accident & emergency	1	1
total	28	24	24

OPD BUILDING

FLOOR	WARD	NUMBER OF DU ROOMS	NUMBER OF CU ROOMS
Ground floor	OPD	2	2
1 st floor	OPD	2	2
total	total	4	4

Note: Waste generated would be taken out as per the schedule timing through service lift near to MRD upto basement and exit through the material gate; whereas the waste generated from Emergency area will be taken out through decontamination room.

For transportation of biomedical waste from cathlab services lift near to mortuary shall be used & the timing for the collection of biomedical waste will be done after 7pm i.e. once the cathlab procedures will be finished for the day.

PCMC BMW EXCESS WEIGHT CALCULATION METHOD 2013-14

PCMC BMW EXCESS WEIGHT CALCULATION METHOD 2013-14								
Financial year (2013-14)	Actual weight (Kg)	Authorised Wt. (365 days)	Authorised Wt. (without day off))	Calculation on 365 days	Calculation on 307 days	Charger on 365 days	Charges on 307 days	Treatment
Yellow Wt. (Kg)	31311.3	2395.3	2014.6	28916	29296.6	838564.5	849602.6	Incineration
Red Wt. (Kg)	33164.3	2395.3	2014.6	30768.9	31149.6	892300.9	903339	Recycle
Sharp container	902	2395.3	2014.6	-1493.2	-1112.6	-43305.1	-32267	Landfill
Glass Wt.(Kg)	8927.2	2395.3	2014.6	6531.9	6912.6	189427.4	200465.6	Recycle
Total BMW Weight	74304.9	9581.2	8058.7	64723.7	66246.2	1876987.7	1921140.2	Total BMW

The above table shows that the charge of excess weight in Red bag has been included in total weight although the Red bags are not meant for incineration. They have also included Sundays in the calculation although the vehicles don't collect waste on Sundays.

RECOMMENDATION FOR PAYMENT 2013-14

Financial year (2013-14)	Actual weight (Kg)	Authorised Wt. (365 days)	Authorised Wt. (without day off))	Calculation on 365 days	Calculation on 307 days	Charger on 365 days	Charges on 307 days	Treatment
Yellow Wt. (Kg)	31311.3	2395.3	2014.6	28916	29296.6	838564.5	849602.6	Incineration
Red Wt. (Kg)	Recycle	Recycle	Recycle	Recycle	Recycle	Recycle	Recycle	Recycle
Sharp container	902	2395.3	2014.6	-1493.2	-1112.6	-43305.1	-32267	Landfill
Glass Wt.(Kg)	8927.2	2395.3	2014.6	6531.9	6912.6	189427.4	200465.6	Recycle
Total BMW Weight	74304.9	9581.2	8058.7	64723.7	66246.2	984686.8	1017801.1	Total BMW

OBSERVATIONS

On the basis of this study it was observed that:

- New policy of BMW collection is found to be more effective than the old one.
- In new method of BMW segregation, category number 4 was divided into 2 parts, for separation of sharps and glass in different containers.
- Green colour bag was also kept for collection of non- infectious waste like plastic bottles, intravenous sets and glass bottles which are not broken as they are not contaminated.
- There were issues with PASSCO Pvt Ltd regarding :
 1. Wrong calculation i.e. BMW is not collected on Sunday but weight is considered as excess and it has been included in calculation.
 2. Wrong method of segregation i.e. according to government waste of category number 4 should be given in one container but the local waste collection agency has asked the hospital to separate it into two parts.
 3. Unjustified authorized weight of 75 gm. per day per bed.
- Issues regarding wrong calculation i.e. Sunday weight was rectified and PASSCO Pvt Ltd has agreed to exclude Sundays from calculation.
- All the departments are not provided with green bags. Although new policy has been formed regarding waste segregation but its implementation has not been done by all the departments.
- Some departments are not separating infectious and non-infectious plastic and rubber waste into different bags.
- The nursing staff is not clear about which bag they are supposed to keep in medication and dressing trolley. Medication trolley and dressing trolley both are provided with 2 containers for collecting waste but the nursing staff is still not clear about the proper segregation of waste.
- Red bag charges included in incinerator fee is still not rectified. PCMC & PASSCO Pvt Ltd both has still not explained why the weight of red bags has been calculated in excess weight as Red bags are not meant for incineration.

CONCLUSION:

On the basis of this study it was found that the new policy for segregation of waste is more effective as the content of Red bag is divided into 2 parts for infectious plastic/rubber waste (Red bag) and non-infectious plastic/rubber and non-broken glass bottles waste (Green bag). This result in reduction of excess waste of Red bags which goes for incinerator and the non-infectious waste from green bags will go for recycling as it is non-infectious.

RECOMMENDATIONS

- Per day per bed calculation on 75 gm. is unjustified. Hospital should check other state weight. According to WHO guidelines total waste generation per bed per day should be between 2.1-4.2 kg in a general hospital.
- Segregate waste as per category in their respective colour of bags.
- Current policies need to be amended and same should be done on immediate basis.
- Training should be given to all the relevant employees about new policy of BMW management for proper implementation.

REFERENCE

www.cwejournal.org/.../need-of-biomedical-waste-management-system

www.cpreec.org/pubbook-biomedical.htm

www.medwasteind.org/random.asp

<https://www.pcmcindia.gov.in>

mpcb.gov.in

www.passco.com