Summer Training at
Apollo Indraprastha Hospitals, New Delhi
(April 3 to June 2, 2017)

Cohorting and Deployment Plan for Hospital

By
Akanksha Saxena

Under the guidance of
Dr. C. Ramesh

MBA Hospital & Health Management
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Institute of Health Management Research
The IIHMR University, Jaipur
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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

CERTIFICATE

This is to certify that **Dr. Akanksha Saxena** has undergone summer training in **Indraprastha Apollo Hospitals , New Delhi** from **3rd April to 2nd June 2017**.

The candidate herself completed the project assign to her during summer training. Her approach to the project was sincere and proactive. This summer training is in partial fulfillment of the course requirement recommended for the award of MBA in Hospital and Health Management.

I wish her success in all her future endeavors.

Col. (Dr.) Ashok Kaushik
Dean (Academic & Student Affair)
The IIHMR University, Jaipur

Mentor
Dr. C. Ramesh
Dean (Pharamceutical Management)
The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Near Sanganer Airport, Jaipur- 302029, Rajasthan, India.
Ph.: 0141- 3924700, 2791431- 32, Fax: 0141 3924738, E-mail: iihmr@iihmr.edu.in, Web.: www.iihmr.edu.in

Indraprastha Medical Corporation Limited

(Indraprastha Apollo Hospitals, New Delhi - A Joint Sector Venture of Govt. of Delhi)
Regd. Office : Sarita Vihar, Delhi-Mathura Road, New Delhi-110 076 (India)
Corporate Identity Number : L24232DL1988PLC030958
Phones : 91-11-26925858, 26925801, Fax : 91-11-26823629
E-mail : imcl@apollohospitals.com, Website : apollohospdelhi.com

Date: June 3, 2017

To Whom So Ever It May Concern

This is to certify that Dr. Akanksha Saxena, student of **Institute of Health Management Research (IIHMR), Jaipur**, has successfully completed two months summer training program, w. e. f. April 4, 2017, which is a part of her course curriculum in MBA (Hospital & Health Management).

During this period she was posted in **M. S. Office** and did a project study on **"Analysis of Prescription Error"** for six months duration.

Besides above, she has also been instrumental in **assisting and coordinating** the following assignments:

- Reviewing the Standard Operating Procedures (SOPs) of Paramedical Departments
- Specialty wise Cohorting of Patients in the hospital
- Maintaining the data of Code Orange cases (indicating the sudden deterioration in patient's condition)
- Primary Source Verification of newly recruited Junior Medical Staff
- Reviewing various records during JCI Survey

During the period of her association with us she was found to be punctual, hardworking and inquisitive.

We wish her every success in life.

for **Indraprastha Medical Corporation Limited,**
(Indraprastha Apollo Hospitals)

Anupam Srivastava

Anupam Srivastava
Manager – T&D

*I would like to express my special thanks to **Mr. Ashok Kaushik** (Dean, IIHMR University) and **Mr. Hem Bhargava** (Placement & Training Head, IIHMR University) for giving me the golden opportunity to pursue my summer internship at **Apollo Indraprastha Hospital, New Delhi**..*

*I am highly thankful to **Dr. Ritu Rawat** (Deputy Director Medical Services) for her aspiring guidance, invaluably constructive suggestions and friendly advices during my tenure at Apollo. I am sincerely grateful to her for giving me incredible opportunities to gain knowledge about management of a healthcare organization. I am also indebted to her for sharing his valuable experiences and giving his truthful and illuminating views on several issues related to management.*

*I express my warm thanks to **Mr. Anupam Srivastav** (Training & Development) for his constant support and guidance throughout my conduct at Apollo.*

*Also, my successful completion of the project would not have been possible without the helping deeds of **Dr. Ranu Khan, Dr. Priti Bansal, Dr. Namita Anand, Mrs. Beena Joseph, Dr. Snehil Tiwari and the entire DDMS office.***

*I would also like to thank my project internal guide **Dr. C. Ramesh** (Dean, Pharmaceutical, IIHMR University) for his constant supervision and support in completing the projects*

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Indraprastha Apollo Hospitals

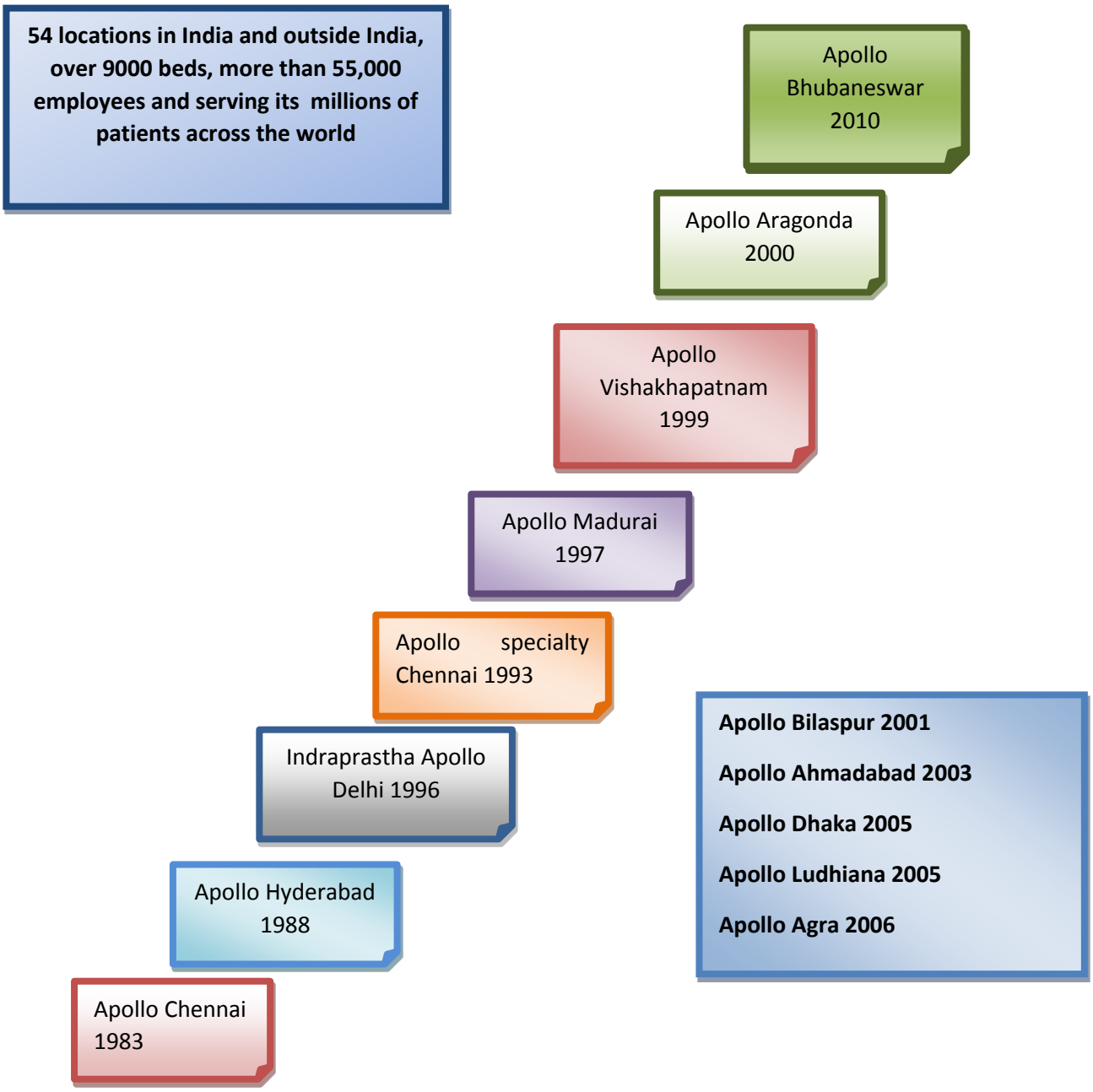
MISSION STATEMENT

"Our Mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and healthcare for the benefit of humanity"

Dr. Prathap C Reddy
Founder Chairman
Apollo Hospitals Group - India

JOURNEY OF APOLLO HOSPITALS:

- The Apollo Hospitals Group was started by Dr. Prathap C. Reddy in 1979.
- The Group started its first hospital at Chennai in 1983 with the initial bed strength of 150.
- The bed strength today stands at over 9000.
- With over 54 owned hospitals, Apollo today is Asia's largest Corporate Hospitals Group.



Company Overview

Apollo Hospitals opened its doors in 1983 and ever since nurtured a goal which read as "Our mission is to bring healthcare of international standards within the reach of every individual. We are committed to the achievement and maintenance of excellence in education, research and healthcare for the benefit of humanity".

Apollo Hospitals was the forerunner of integrated healthcare in Asia, as well as globally. Today, the group's futuristic vision has ensured that it has been in a position of strength at every touch point of the healthcare delivery chain. Its presence encompasses over 10,000 beds across 64 hospitals, more than 2200 pharmacies, over 100 primary care & diagnostic clinics, 115 telemedicine units across 9 countries, health insurance services, global projects consultancy, 15 academic institutions and a Research Foundation with a focus on global clinical trials, epidemiological studies, stem-cell and genetic research.

Apollo Hospitals has always strongly believed in social initiatives that help transcend barriers. In keeping with this, the group has started several impactful programs in this area. One among these initiatives is SACHi (Save a Child's Heart Initiative) - a community service initiative with the aim of providing quality pediatric cardiac care and financial support to children from underprivileged sections of society suffering from heart diseases. Apollo also runs the SAHI (Society to Aid the Hearing Impaired) initiative to help poor children with hearing impairment, and the CURE Foundation which is focused on cancer screening, cure and rehabilitation for those in need. In the area of Cancer care Apollo has also joined hands with Yuvraj Singh's YOUWECAN to organize massive cancer screenings. Apollo regularly conducts comprehensive health screening camps across the nation. The Group actively leverages its telemedicine and mHealth capabilities to take its screening programs to even remote corners of the country.

Apollo's remarkable story has captured India's attention. For its service to the nation, the Group was felicitated with the honor of a commemorative postage stamp bearing its name. For his untiring pursuit of excellence in healthcare, Dr. Prathap C Reddy, was bestowed with the second highest civilian award, the 'Padma Vibhushan', by the Government of India.
Recently Apollo Hospitals celebrated its 30th year. The Group, led by Dr. Prathap Reddy, reaffirmed its goals and redefined their focus. With ambitious projects like Apollo Reach Hospitals, a strong focus on preventive healthcare and an unabated commitment to nurture excellence and expertise in healthcare, Apollo Hospitals envisions for a new horizon - a future where the nation is healthy, where its people are fighting fit, and India emerges as the preferred global healthcare destination. Besides, specialized facilities like Multi Organ Transplant Unit make Indraprastha Apollo Hospitals not just the capital's, but the nation's pride.

Committees at Apollo

The committees which helps in the smooth functioning of the hospital and make employees work efficiently are:

- Quality Steering Committee
- Infection Control Committee
- Safety Committee
- Credentialing Committee
- Authorization Committee
- Appraisal Committee
- Medical Audit Committee
- Ethical Committee for Clinical Trials
- Ethics Committee
- Code Blue Committee
- Drug Committee
- Transfusion Committee
- Death Review Committee
- OT Committee

PROJECT # 1

COHORTING PLAN OF HOSPITAL

ABSTRACT:

For the success and sustainability of organization, there is a need for healthy and promised employees. Deprived of this fact, the organization cannot be able to carry out the justified quality of care to the patients. And cannot aid in serving as the leaders and partners in healthcare societies. The planning and development of staff should be done keeping the future needs in mind, healthcare is not only about the present caregivers. The planning should be in such a way that it should not answer only the crisis condition but also serve as a complete plan for the organization. The healthcare planning is now a priority because of the increasing demand of the healthcare, increased geriatric population, staff deficiencies, change in health delivery system. Due to these reasons, the hospital staff impacts the delivery of health care to patient. To address the needs of the society, the healthcare personnel need to work efficiently and effectively, this can be achieved with the wide-ranging planning of the staff.

INTRODUCTION:

Cohorting involves placing patients and their physicians at specific geographic locations in the facility. Generally, patients are placed randomly to available beds throughout the hospital, without considering the geographic location of the concerned speciality doctor. Healthcare delivery is blight with wastes that impact the quality of patient care. Various articles have demonstrated that the putting the right patient in the right bed under the right caregiver is a contributor to the efficient delivery of patient care. Cohorting also includes the support staff of caregivers, including nursing staff, housekeeping etc.

The cohorting plan applies in such a way that all the stakeholders like nurses, housekeeping, dietician, physiotherapists and other staff of the relevant departments stay together with the concerned speciality patients in a particularly defined geographical location. Since the nurses and the other helping staff knows their exact job it becomes a recurrent task for them, which helps them execute their job effectively and efficiently, in the defined time and by the cooperation of all the staff of the hospital the cohorting can be achieved to maximum level of output with minimal inputs.

Health care is a labour concentrated industry, and human resources are the most important input into the provision of health care and the largest proportion of health care expenses. It is notable that the human resources in the hospital is under-managed. The supply and demand of human resources in hospitals is a low

topic of discussion which denotes the lag of the system and has been discussed over the decades but is still unresolved.

Healthcare is an upcoming field which require vast human resources and managing these is a major challenge as it requires round the clock support. The hospital requires an increased level of flexibility from staff. This may require them to work differently and move flexibly between services and sites where possible. Staff are required to work where the patient and service need is greatest, to ensure safe, high quality care and sustainable service delivery.

LITERATURE REVIEW:

As reviewed from articles and publications, strategic workforce planning is the process links and guides the organization to ensure the right placement of right people at right place in right time. [1]

There are certain fundamentals that are incorporated in the workforce planning of any organization:

- Plan forthcoming demand
- Evaluate forthcoming supply
- Identify the gap
- Plan to close the gap.

The allocation and planning of bed is becoming difficult with increase in demand and financial restraints. As per studies, in the past few years' hospitals are involved in certain efforts including cost-cutting, rationalizing departments, merging small services and the decreasing the stay of patient in hospital. [2]

Cohorting beds and wards is the background activity of the hospitals. But it has always been unresolved despite of several studies, bringing in loads of problems for physicians, housekeeping, nursing and as well as administrative staff. [3]

As the allocation and planning is a complex process, many hospitals adapt demanding methods for staffing and planning, to ensure satisfactory and suitable delivery of health care services. Many countries use one such method known as Workload Indicators of Staffing Need (WISN), in which with the help of analysis, staffing necessities are regulated [4]
The hospitals using the WISN method were observed as the data was more reliable because the different responsibilities performed by different staff were well-defined, and the distribution of the staff effects the quality of care [4]

METHODS OF STAFFING AND PLANNING:

1. **New Approaches to Determining Staffing Needs:**

Many organizations adapt approaches for staffing needs, which were built on some activity, as they rise from the outdated methods for staffing [5].

2. **Organizational Structure for the Study**:

A committee is established for the support political and technical both. The understanding of the organization and activities taking place were discussed and the planning was done accordingly. [5]

3. **Setting activity standards and standard workload:**

There are several activities taking place in the organization which helps in determining the workload which includes surgeries, in-patients, deliveries, discharges etc. To streamline the physicians and workload, a standard need to be set which will help in determining the time required by the staff to achieve a certain goal which in turn will increase the efficiency of the staff as well as the hospital [6].

For the future success of the organization and to meet the needs of patients, the health care personnel should plan and develop workforce in a way that it accomplishes the organization's goal. For the betterment of the patients, the existing workforce should be used proficiently, and new possessions should be engaged. For this organization need to identify the major challenges and the pioneering tactics for improved recruitment, education and training of healthcare personnel.

The process will help in recognizing future needs of the staffing and help in improving the strategies, goals and behaviours for constructive change.
Manpower planning and expansion will help healthcare personnel in identifying deficient skills and competencies or what is required to accomplish organization's goals and the financial support needed to achieve the vision.

Practical planning and conduit growth will lead to avoidance of immediate workplace catastrophes. It is vital for the organization to have the planned workforce at all levels and positions. With the knowledge of skills and capacity of employees, building strategic planning and retaining employees in the organization will be become feasible [7].

RECOMMENDATIONS FOR PLANNING:

- Know organization's revolution strategy.
- Identify organization's model of care or create it

- Establish personnel plan depending on the needs of community and model of care.
- Identify timelines for executing and transitioning several elements of strategy
- For new roles and purposes of the organization identify the education or training plan. [7]

There is a continuous need for the strategic planning and development of the workforce in the organization as the healthcare is the field of continuous change. This change should be done keeping in mind the changing health delivery systems, increase burnout of the staff and the increasing demand of the healthcare. Therefore, the planning of the staff and beds should ensure the smooth and efficient delivery of healthcare and decrease burden on staff with increase patient and doctor satisfaction.

AIM:

The aim of this study is to increase the quality of patient care delivery and cost effectiveness by effective and efficient utilization of the available resources and also anticipate the needs of the patient for meticulous response by the stakeholders.

OBJECTIVE:

1. Cohorting of hospital including:
   - Bed distribution
   - Floor distribution
2. Efficient Streamlining of JMS (Junior Medical Staff)

PROBLEM STATEMENT:

There is a need for coordinating and cohorting the plan of hospital and its sustainability.

IDENTIFICATION OF PROBLEM:

The problem identified is the un-cohorted bed allotment of patients of various ailments / specialties / sub specialties into the wards i.e. one general ward consists

of patients of different specialties which further create problems in care delivery by all the stakeholders involved in patient care.

The ICU's (Intensive Care Unit), HDU's (High Dependency Unit) , Pediatrics and Gynecology and Obstetrics are broadly cohorted which cover close to half of the in-patients, the hospital is facing a problem of mixed cases in the wards which makes it inconvenient for all caregivers to complete their rounds / work in time, thereby making provision of efficient care difficult.

ROOT CAUSE:

The root cause of the problem is the incompatible planning, allotment of beds to patients and doctors in the wards which causes workload to increase resulting in patient and physician dissatisfaction. On observation, it was found that, for 1 JMS to complete 1 round with an average of 7 patients, it takes about 4hrs including the new admissions and discharge patients, if any.

TARGET CONDITION:

There are few situations which are needed to be targeted for solving the problems:

- Decreased walk time of physicians
- Increased efficiency of all the stakeholders
- Increased nurse-doctor communication
- Increased doctor-patient communication
- Decreased stress on staff.

IMPLEMENTATION PLAN:

For the above-mentioned problem statement, there needs to be a proper implementation plan. The proposed plan suggests that there should be a segregation of departments which will help in reducing the patient mix in the ward, proper allotment of patients into the required specific specialty. The proposed plan has been created keeping the following points in mind:

- Average no of patients admitted in a day
- Average bed occupancy
- Average speciality wise bed occupancy

- Floor distribution
- Category wise bed distribution
- Deployment of staff

PROCESS:

A non-interventional study was done on the cohorting of the hospital services at Indraprastha Apollo Hospitals, Delhi. The study was conducted on the work flow of the Residents of the hospital. Secondary data was collected for the study and the appropriate conclusion was drawn. The study focused on the existing work flow of the residents, patient distribution in the wards, average admissions in a day, average bed occupancy and floor distribution of the residents. Based on the study suitable recommendations were made.
The data used was of last 4 months from the day of report making.
Data includes Jan2017, Feb2017, Mar2017, and Apr 2017. The data is self-analyzed, and the average of data is taken into consideration for the segregation of the wards and the patient's speciality wise.

SEGREGATION OF DEPARTMENTS:

1) MEDICAL:

- Internal medicine
- Endocrinology
- Respiratory medicine
- Gastroenterology
- Geriatic Medicine
- Dermatology
- Rheumatology

2) SURGICAL:

- General surgery (including gastro surgery)
- Plastic surgery
- Ophthalmology
- Urology

- ENT
- Vascular Surgery
- Surgical Gastroenterology

3) PEDIATRICS:

- General pediatric
- Pediatric surgery and Urology
- Pediatric cardiology
- Pediatric CTVS
- Pediatric Gastro
- Pediatric Orthopedics
- Pediatric Neurology

4) OBS. & GYNAE:

- Obs. & Gynae
- Neonatology
- Fetal medicine

5) ONCOLOGY:

- Medical oncology
- Surgical oncology
- Radiotherapy
- BMT

6) CARDIAC SCIENCES:

- Cardiology
- CTVS

7) NEUROSCIENCES:

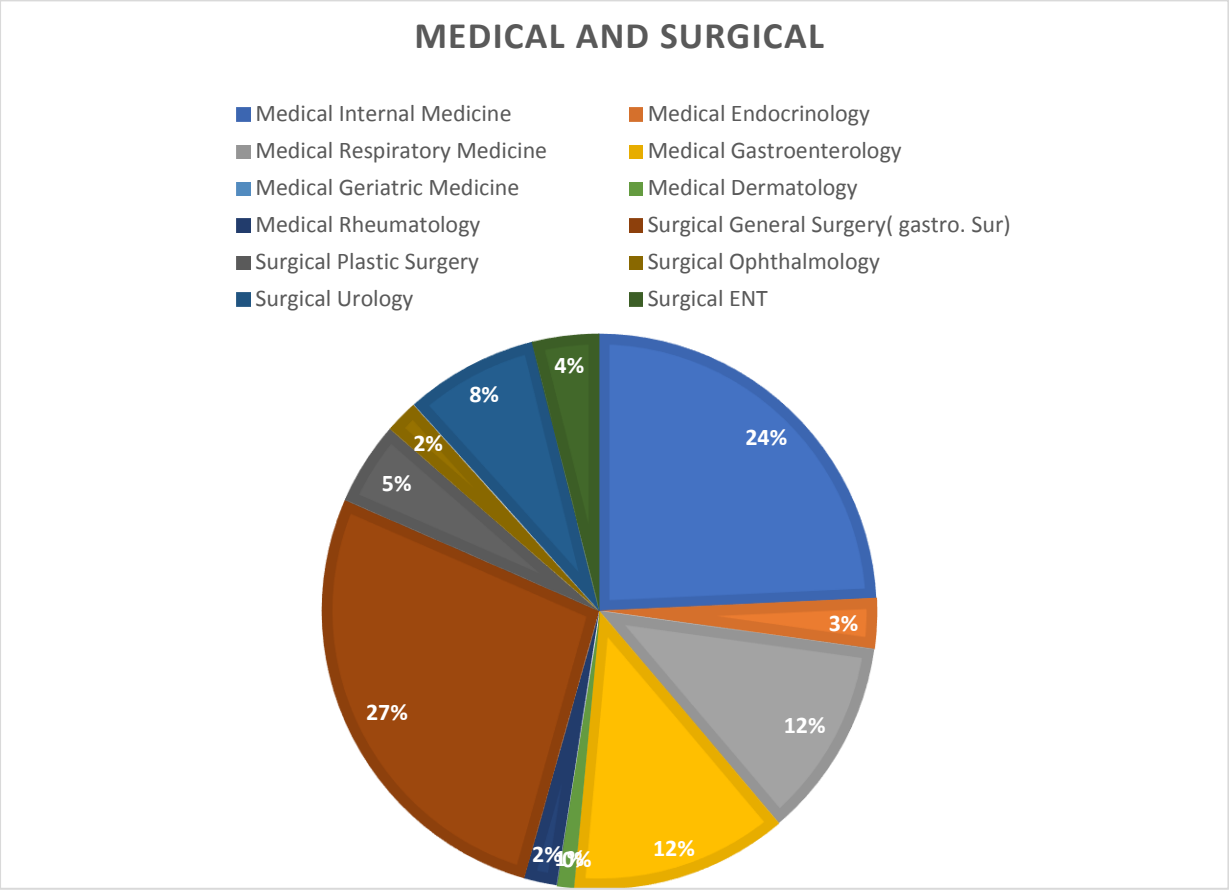
- Neurology
- Neurosurgery

8) TRANSPLANT:

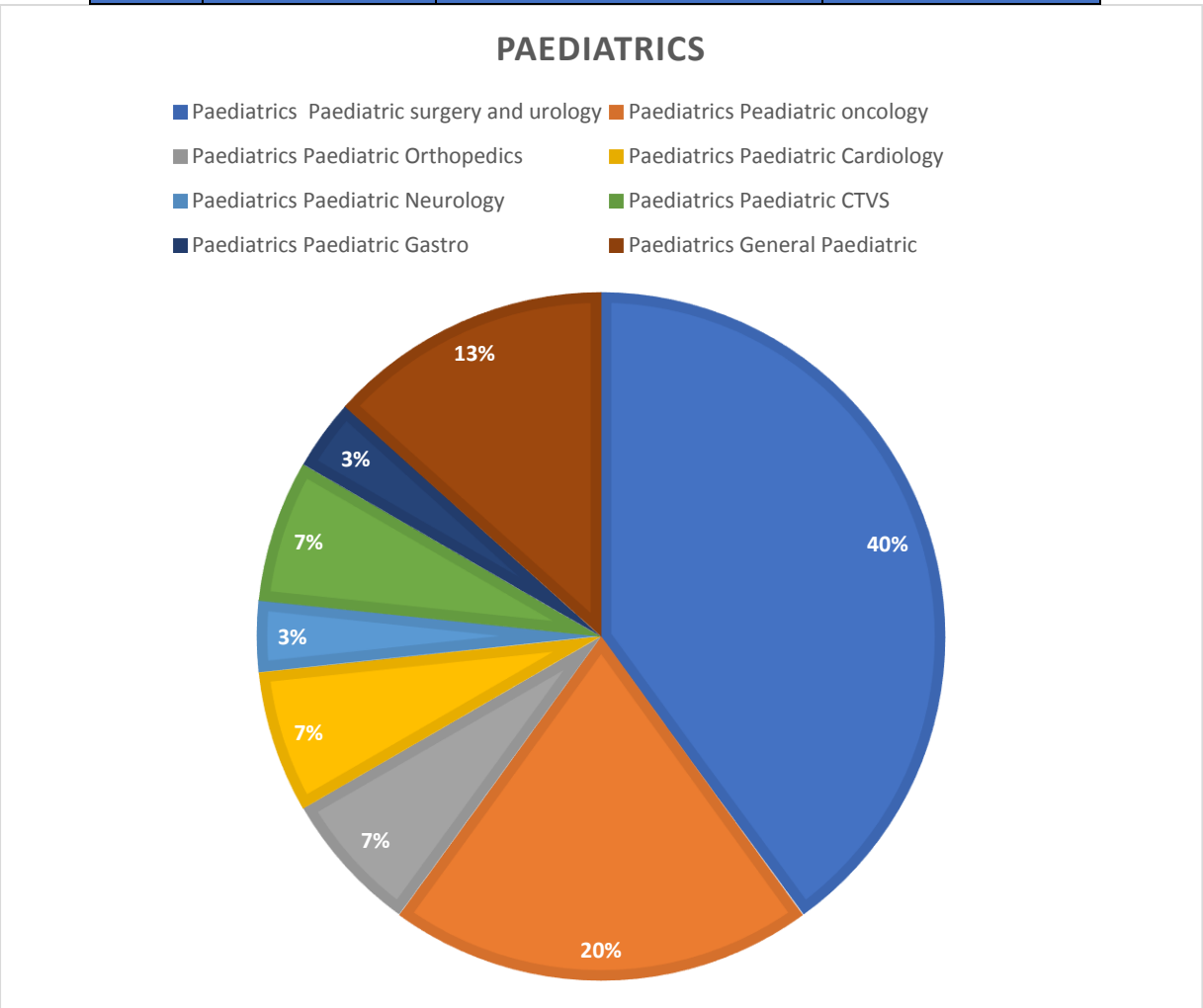
- Renal transplant
- Liver transplant
- Nephrology

9) ORTHOPEDICS

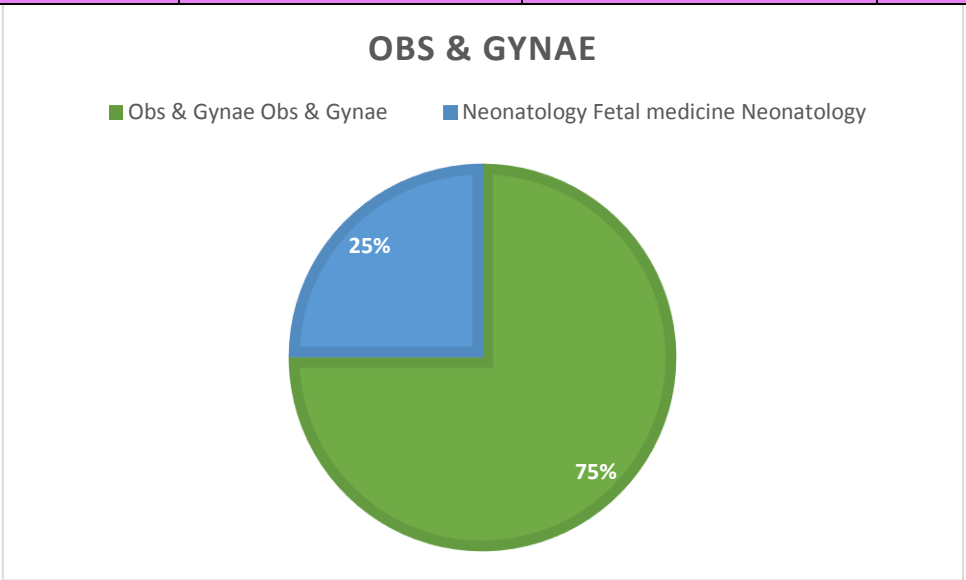
SPECIALITY WISE DISTRIBUTION OF PATIENTS				
Sl No.	**Departments**	**Specialities**	**Average Admissions (Jan-Apr17)/Month**	**Average patients/day**
1	Medical	Internal Medicine	164	25
		Endocrinology	18	3
		Respiratory Medicine	92	12
		Gastroenterology	115	13
		Geriatric Medicine	1	0
		Dermatology	1	1
		Rheumatology	23	2
2	Surgical	General Surgery(gastro. Sur)	185	28
		Plastic Surgery	40	5
		Ophthalmology	35	2
		Urology	186	8
		ENT	93	4
		TOTAL	**953**	**103**



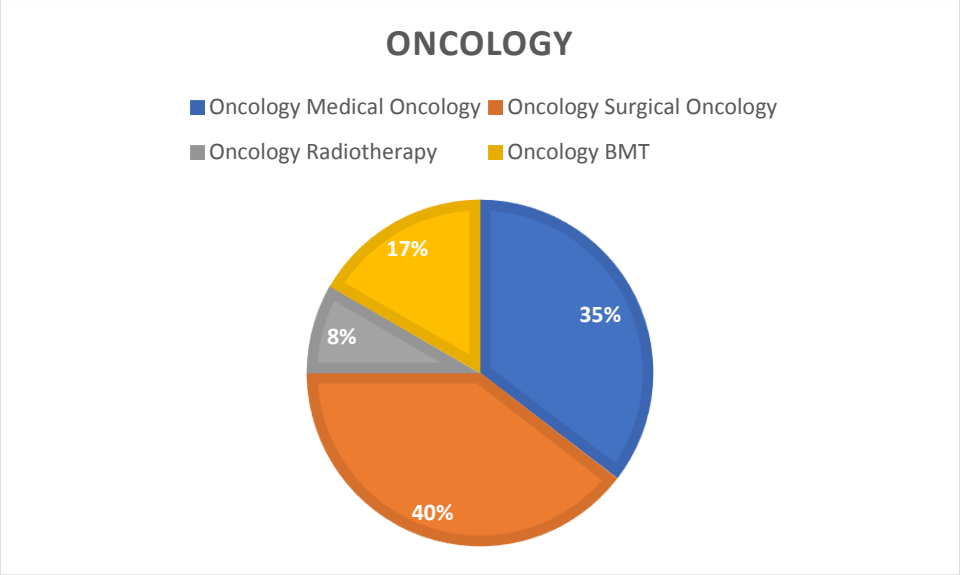
SPECIALITY WISE DISTRIBUTION OF PATIENTS			
Sl No.	**Departments**	**Specialities**	**Average patients/day**
3	Paediatrics	Paediatric surgery and urology	12
		Peadiatric oncology	6
		Paediatric Orthopedics	2
		Paediatric Cardiology	2
		Paediatric Neurology	1
		Paediatric CTVS	2
		Paediatric Gastro	1
		General Paediatric	4
		TOTAL	**30**



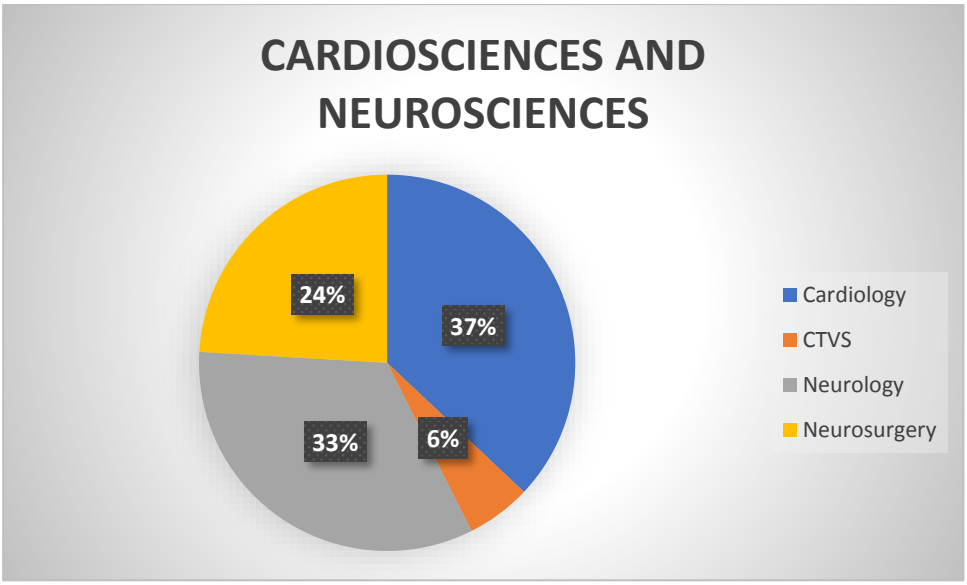
SPECIALITY WISE DISTRIBUTION OF PATIENTS				
Sl No.	**Departments**	**Specialities**	**Average Admissions(Jan-Apr17)/Month**	**Average patients/day**
4	Obs & Gynae	Obs & Gynae	120	18
	Neonatology Fetal medicine	Neonatology	69	6
				0
		TOTAL	189	24



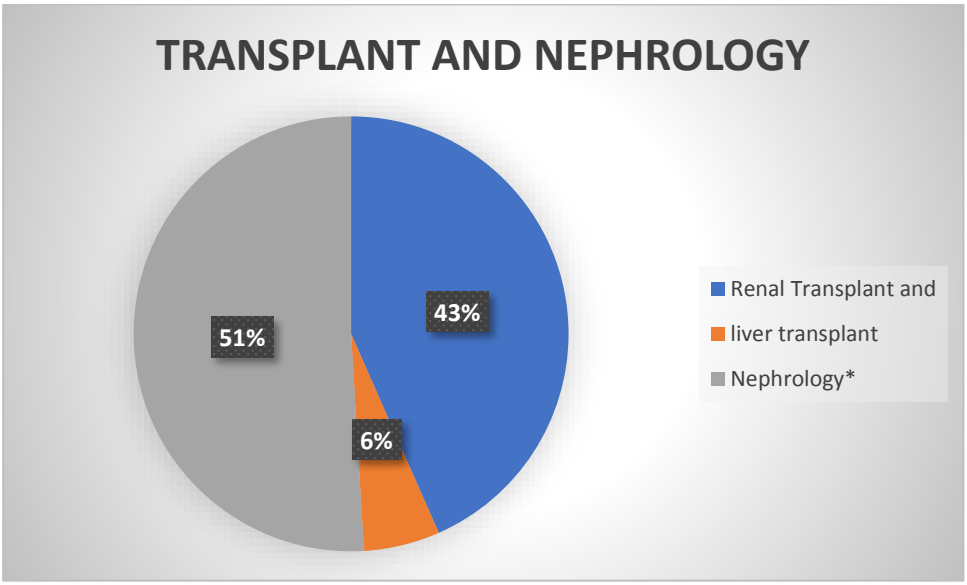
SPECIALITY WISE DISTRIBUTION OF PATIENTS				
Sl No.	**Departments**	**Specialities**	**Average Admissions(Jan-Apr17)/Month**	**Average patients/day**
5	Oncology	Medical Oncology	545	17
		Surgical Oncology	325	19
		Radiotherapy	93	4
		BMT	64	8
		TOTAL	**389**	**48**



SPECIALITY WISE DISTRIBUTION OF PATIENTS				
Sl No.	**Departments**	**Specialities**	**Average Admissions(Jan-Apr17)/Month**	**Average patients/day**
6	Cardiac Sciences	Cardiology	324	20
		CTVS	56	3
7	Neurosciences	Neurology	94	18
		Neurosurgery	114	13
		TOTAL	**588**	**54**



SPECIALITY WISE DISTRIBUTION OF PATIENTS				
Sl No.	**Departments**	**Specialities**	**Average Admissions(Jan-Apr17)/Month**	**Average patients/day**
8	Transplant	Renal Transplant and	138	23
		liver transplant	46	3
		Nephrology*	226	27
		TOTAL	**410**	**53**



SPECIALITY WISE DISTRIBUTION OF PATIENTS				
Sl No.	**Departments**	**Specialities**	**Average Admissions(Jan-Apr17)/Month**	**Average patients/day**
9	Orthopedics	**TOTAL**	**151**	**29**

PROPOSED COHORTING PLAN

DEPARTMENTS	**FLOORS**	**WARDS**
Medical and surgical	2FT1 + 2FT2 extn.+ 5FT1 + 6FT2 wing A & B	GW+NEW GW 1&2+SINGLE+ SPVT(wing A & B) 72+ 33+ 24 +24= 153
Paediatrics	5FT2	SINGLE*+SPVT+GW 14 + 6 + 8= 28
Obs. & Gynae	3FT2	SINGLE*+SPVT+GW 5+6+4=15
Oncology	3FT1+3FT3	GW+ SINGLE* 41+41=82
Neurosciences and gastroenterology + Transplant and Nephrology	4FT1	SINGLE*+SPVT+GW 11+22+8=41
	4FT2	SINGLE*+SPVT+GW 10+16+8=28
Orthopedics and Cardiac sciences	6FT2 (wing C&D)+4FT3+ 2FT2	SPVT wing C&D+ GW of 6FT2 +SINGLE*+GW 24+8+28+20=80

SINGLE* - SINGLE + DELUXE + SUITES

6FT1- MIXED CASES (8 suites)

- *RECOMMENDATION* - Since there are no semi-private rooms for oncology, two single rooms can be converted into semi-private rooms where we can accommodate 4 beds.
- Patients referred by government and free wards are not included.
- The proposed cohorting plan has been made keeping the constraints in mind like infrastructure.

DISTRIBUTION OF BEDS WARDS AND SPECIALITY WISE

FLOORS	BED CATEGORY	NUMBER OF BEDS	SPECIALITY ALLOCATED
2FT1	GW	72	
2FT2	NEW GW(1&2)	33	
5FT1	SINGLE	24	
6FT2 WING (A&B)	SPVT	24	
		153	**MEDICAL& SURGICAL**
5FT2	SINGLE	14	
	SPVT	6	
	GW	8	
		28	**PAEDIATRICS**
3FT2	SINGLE	5	
	SPVT	6	
	GW	4	
		15	**OBS & GYNAE**
3FT1	GW	41	
3FT3	SINGLE	41	
		82	**ONCOLOGY**
4FT1	GW	8	
	SINGLE	11	
	SPVT	22	
		41	
4FT2	SINGLE	4	
	SPVT/HDU	16	
	GW	8	**Transplant & nephrology,**
		28	**neurosciences & gastroentology**
6FT2 WING (C&D)	SPVT+GW	24+8	
2FT2	GW	20	
4FT3	SINGLE	28	**ORTHOPEDICS AND**
		80	**CARDIACSCIENCES**

*total beds covered in the following table is 427, excluding 6FT1 which contains 8 suites bringing the total to 435, which is the total no. of beds in the wards.

DEPLOYMENT PLAN

INTRODUCTION:

Health care industry is a workforce concentrated industry, and manpower are the most significant input into the facility of the health care and the major share of health care expenses. It is noteworthy that the manpower in the hospital is not efficiently managed. The topic of supply and demand of manpower in hospitals is always under-discussed which signifies the lag of the system.

The major challenge of the healthcare system is the requirement of vast manpower and the support round the clock as it is the forthcoming field in the future. For the efficient working of the hospital, it requires improved level of flexibility of staff. For this, the staff needs to work in a different way and in compliance with the services and sites where ever possible. To ensure safe, excellence care and justifiable service delivery, the staff are need to be placed where the service need is supreme.

STATEMENT:

Deployment of staff is seen as a short-term decision to meet conditions of crucial need. The procedure used aims to ensure that the patients are being delivered with excellence care and are treated equally.

AIM:

The aim of this procedure is to make staff work in a different way and move compliantly between services and sites. Staff are required to work where the patient and service need is supreme, in order to ensure safe, high excellence care and justifiable service delivery.

OBJECTIVES:

The deployment of staff will help Apollo Hospitals to fill crucial gaps and to release pressure from staff and services.

SCOPE:

This procedure applies to all JMS (Junior Medical Staff).

DEPLOYMENT:

To deploy is to "spread out or arrange strategically".

Deployment of the junior medical staff is the efficient way to increase the productivity in the hospital. Resident are the medical graduates posted with the consultants of different specialities. The resident is responsible for the patients of the consultants under whom they are working. Because of the posting with consultants and the scattered distribution of the patients into different wards and ICU's, there is increase pressure on the resident to complete the rounds of all patients within the defined time. This leads to increased fatigue in the resident, increase walk time of the resident, decrease efficiency of the resident, decrease patient satisfaction as the resident cannot give the appropriate time to every patient as he/she has other patients and also the new patients coming for admission under the concerned consultant.

Deployment can be done by segregating the resident on the floors instead of posting them with consultants. By this, the resident will be responsible for the patients of his/her respective floor irrespective of the consultant. This may decrease the walk time of the resident, increased efficiency and patient satisfaction.

During this procedure, the patients were cohorted according to their speciality on a floor.
Like this, the floors were designated with speciality of patients admitted there. This may help as on one floor there will patients of same speciality or two specialities, this will make easy for the resident as well as for the consultant to look after the patients effectively.

After the floors and patients were cohorted, there comes the distribution of the resident or registrars on the floors. In Apollo, there are 142 registrars which are assigned 30 patients each. During the deployment of the resident the diagnostic departments were not touched. Deployment was excluding the diagnostic procedures.

CURRENT PLAN

JMS associated with Consultants covering IP/Diagnostic Area- Registrars / JC / AC					
S.No	**Specialities**	**Ass cons// Jr Consultant**	**Registrar**	**Resident**	**Total**
1	Internal Medicine	0	2	6	8
2	Neurology	0	6	1	7
3	Endocrinology	0	2	0	2
4	Respiratory Medicine	0	3	0	3
5	Nephrology	0	6	0	6
6	Gastroenterology	0	6	0	6
7	Cardiology	5	0	4	9
8	Medical Oncology	0	5	4	9
9	General Surgery	0	8	2	10
10	GI Surgery	0	2	0	2
11	Plastic Surgery	0	3	0	3
12	Urology	1	5	0	6
13	Surgical Oncology	0	6	1	7
14	Neurosurgery	1	6	0	7
15	Orthopaedics	0	9	0	9
16	ENT	0	4	0	4
17	Ophthalmology	0	1	0	1
18	Paediatric Surgery	0	3	0	3
19	Radiology	0	7	0	7
20	Radiotherapy	0	3	0	3
21	Nuclear Medicine	0	1	0	1
22	Renal Transplant Surgery*	3	4	2	9
23	Liver Transplant Surgery *	0	3	0	3
24	Obstetrics and Gynaecology	0	7	0	7

25	CTVS Surgery I &II	3	2	2	7
26	Cardiac Anaesthesia	2	4	0	6
27	Paediatric cardiology / Paed CTVS	0	5	0	5
28	General Anaesthesia	0	9	0	9
29	Neuro Anaesthesia	0	5	0	5
30	Paediatric	2	1	1	4
31	Paediatric Gastroenterology	2	1	1	4
32	Histopathology/ Micro	0	1	0	1
33	Blood Bank	0	1	0	1
34	TMT	0	1	0	1
36	Staff Clinic	0	1	0	1
38	Hyperbaric Medicine	0	1	0	1
39	AMO	0	1	0	1
40	Day Care I & II	0	0	1	1
41	Neonatology	0	4	0	4
42	Reliever	0	0	12	12
43	Govt referred Physician office	0	1	0	1
	Total	**19**	**140**	**37**	**196**

Total Number of Junior medical Staff is 99+ 196= 295

***295 are the total staff of JMS which includes 71 DNBs**

ICU/HDU/DIALYSIS/EMERGENCY SHIFT(Morning/ Evening/ Night/off)						
			Number of Doctors			
S.No	**Wards**	**Sanctioned Beds**	**M**	**E**	**N**	**off**
1	DIALYSIS	23	2	1	2	2
2	2 T-2 (HD Unit)	37	3	2	2	2
3	2 F T 2 (STP DN ICU)	13	1	1	1	1
4	3 FLOOR T 1 (BMT ICU)	6	1	1	1	1
5	LIVER -ICU	17	1	1	1	1
6	RENAL ICU	12	2	1	1	1
7	MEDICAL ICU (1st FLOOR)	14	2	2	2	2
8	CORONARY CARE UNIT (1st FLOOR)	17	2	2	2	2
9	NEURO ICU+STP DN (1st. FLOOR)	18	2	2	2	2
10	STROKE ICU (1st FLOOR)	6	1	1	1	1
11	SURGICAL ICU - I (1st FLOOR)	9	1	1	1	1
12	SURGICAL ICU - II (1st FLOOR)	9	1	1	1	1
13	CTVS ICU (Inc. STDN) (1st FLOOR)	24	1	1	1	1
14	G-MICU (1st FLOOR)	20	3	2	2	2
15	FREE ICU (4148-4159)	12	1	1	1	1
16	EMERGENCY	18	4	3	3	3
	TOTAL	**263**	28	23	24	24
	Total number of Residents and Registrars		**99**			

PROPOSED AREA WISE DEPLOYMENT:

- It is proposed that resident doctors rather than being posted with the consultants should be deployed on the floor according to the proposed cohorting plan. This will increase the effectiveness of the resident doctors and improve the doctor patient relationship
- Surgical and orthopaedics registrars can also be posted OT wise and in wards rather than with consultants for smooth and effective compliance of the hospital services.

I. Ward wise allocation of resident doctors

Area wise Deployment of Resident Doctors					
Area	**Number of beds**	**Total No of resident doctors**	**9am to 5 pm**	**5 pm to 9 am**	**Post night off**
2 FT1	72	7	3	2	2
New Gen Ward 1 and 2 (2nd floor)	33	2	2	1	1
2FT2	20	2			
3FT1	47	4	2	1	1
4FT1	43	4	2	1	1
4FT2	25	1	1		
5FT1	24	2	2	1	1
6FT1	13	2			
6FT2	56	4	2	1	1
3FT3	41	7	3	2	2
4FT3	31				
1FT3	37	4	2	1	1
Surgical Day care including Cath Lab	8	2			
Total	**450**	**41 Residents**			
*3FT2 (and 5FT2 are excluded as they have Gynae-Obstetrics and Pediatric and Neonatal patients and doctors respectively					

PROPOSED PLAN

JMS associated with Consultants covering IP/Diagnostic Area- Registrars / JC / AC					
S.No	**Specialities**	**Ass cons// Jr Consultant**	**Registrar**	**Resident**	**Total**
1	Internal Medicine	0	2	6	8
2	Neurology	0	6	1	7
3	Endocrinology	0	2	0	2
4	Respiratory Medicine	0	3	0	3
5	Nephrology	0	6	0	6
6	Gastroenterology	0	6	0	6
7	Cardiology	5	0	4	9
8	Medical Oncology	0	5	2	7
9	General Surgery	0	8	2	10
10	GI Surgery	0	2	0	2
11	Plastic Surgery	0	3	0	3
12	Urology	1	5	0	6
13	Surgical Oncology	0	6	1	7
14	Neurosurgery	1	6	0	7
15	Orthopaedics	0	9	0	9
16	ENT	0	4	0	4
17	Ophthalmology	0	1	0	1
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33	Blood Bank	0	1	0	1
34	TMT	0	1	0	1
36	Staff Clinic	0	1	0	1
38	Hyperbaric Medicine	0	1	0	1
39	AMO	0	1	0	1
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41	Neonatology	0	4	0	4
42	Reliever	0	0	12	12
43	Govt referred Physician office	0	1	0	1
	Total	**19**	**140**	**35**	**194**

ICU/HDU/DIALYSIS/EMERGENCY SHIFT(Morning/ Evening/ Night/off)						
			Number of Doctors			
S.No	**Wards**	**Sanctioned Beds**	**M**	**E**	**N**	**off**
1	DIALYSIS	23	2	1	2	2
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11	SURGICAL ICU - I (1st FLOOR)	9	1	1	1	1
12	SURGICAL ICU - II (1st FLOOR)	9	1	1	1	1
13	CTVS ICU (Inc. STDN) (1st FLOOR)	24	1	1	1	1
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15	FREE ICU (4148-4159)	12	1	1	1	1
16	EMERGENCY	18	4	3	3	3
	TOTAL	**263**	28	23	24	24
	Total number of Residents and Registrars		**99**			

Total Number of Junior Medical Staff is 99+ 194 + 41= 334

Deployment plan for Orthopaedics and General Surgery

Speciality	Total no (existing)	Proposed deployment
Orthopaedics	9 posted Consultant wise	5 in the two OTs (Ortho OT Ground floor) with staggered timings 1 in wards 2 for pre-and post-duty off 1 reliever
General surgery	10 posted Consultant wise	6 in OTs with staggered timings 1 in wards 2 for pre-and post-duty off 1 reliever

RESULT:

The staff of Indraprastha Apollo can be deployed with a minimal margin of about 1%. Keeping the DNBs and the resident doctors in mind by the ratio of 30:1 the following changes as mentioned in the proposed table can be achieved.

CONCLUSION:

According to the WHO standards, the average doctor to bed ratio is 1:15 in wards and 1:4 in ICU's. In Apollo Hospitals, Delhi the hierarchical distribution of doctors is seen as:

- Consultants

- Registrar

-Senior Resident

- Resident/ JC/AC/DNB/JR

Which shows that Apollo Hospitals is in compliance with WHO standard. As per the data provided and observations made, the conclusion was drawn that the deployment can be done by minimal margin of 1% keeping all the constraints in mind like infrastructure etc.

SUMMARY OF COHORTING PLAN:

SPECIALITIES	TOTAL BEDS	FLOOR
Medical + Surgical	72	2FT1
	33	2FT2 EXTN
	24	6FT2 (A&B WING)
	24	5FT1
Pediatrics	28	5FT2
Obstetrics & Gynecology	15	3FT2
Oncology	41	3FT3
	41	3FT1
Orthopedics and Cardiacsciences	24	6FT2 (C&D WING)
	28	4FT3
	20	2FT2
Transplant Unit & Nephrology	28	4FT2
Gastroenterology & Neurosciences	41	4FT1

*excluding the HDUs, ICUs, Step Down ICUs and Free Wards.

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PROJECT # 2 PRESCRIPTION ERROR

Abstract:

The increasing attention is given to the prescription errors and the harm caused by them. There have been very few studies on the incidence and causes of the prescription errors, they are the common causes of preventable iatrogenic injury. It is seen that around 1-2% of all medication errors are the prescribing errors, which cause harm in about 1% of admissions. Cultural changes and intervention in organization are required to decrease the incidences. Prescription errors are not uncommon, across the globe as per different database the prevalence of prescription errors range from 1%-8% of prescriptions generated. Various causes related to occurrence of these errors include: illegible handwriting, inappropriate use of abbreviations, improper dose calculations, lack of specific drug / brand knowledge, carelessness / distractions while writing prescriptions, improper drug / allergy history and documentation, incomplete prescription components etc. Medication errors may be critical or severe enough to cause significant patient harm that makes it important to have a mechanism of collecting, analysing and taking appropriate measures to reduce the error burden. Impact is more worrisome for special population including paediatrics, geriatrics, renal and hepatic functional derangements due to altered pharmacokinetics. Of all errors around 9.6% of prescription errors have been reported to cause significant and harmful patient related events as per some published studies.

INTRODUCTION:

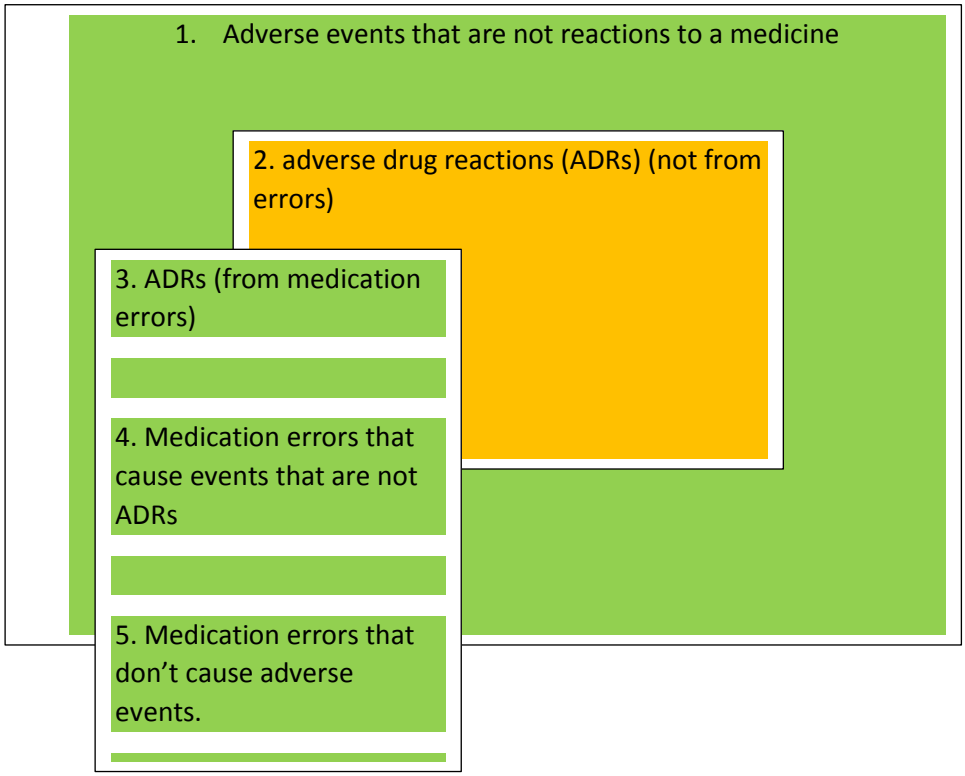
AN ERROR:

An error is ‘something inaccurately done through ignorance or carelessness; a mistake, e.g. in calculation, judgement, speech, writing, action, etc’ [6] or ‘a failure to complete a planned act to achieve as intended, or the use of an incorrect plan of action to achieve a given aim’ [7]

A MEDICATION ERROR:

A medication error can be defined as ‘a failure in the treatment process that leads to or has the potential to lead to harm to the patient’ [8]

The term ‘failure’ signifies that process fails to attain a sustainable standard. The treatment process includes manufacturing or compounding, prescribing, transcribing (when relevant), dispensing and administration of a drug and the subsequent monitoring of its effects. The figure shown below shows how medication errors fit in the above-mentioned way. [8]



LITERATURE REVIEW:

The nature of the healthcare system is very complex. Because of this nature, it is important to assess risk and damage to patient, as the nature may increase the risk of mistakes and worsen the condition of the patient. Technological support, interaction between professional and institutions and critical situations are the part of this complexity. [1]

Per WHO, the pointless or possible harm associated with healthcare should be reduced to minimum. [2]

The Adverse Drug Events are defined as injury resulting from medical intervention related to a drug and prescription error are one of the causes of adverse incidents. [3]

The reason for occurrence of prescription errors include inadequate knowledge, unavailability of, or failure to recognise, important patient information or drug properties [4]

Some of the prescription errors are not identified until the later stages which have serious consequences for patients and although identified in later stages they may only be the 'tip of iceberg'. These errors may lead to increase morbidity and mortality as well as increased length of stay and finances [5]

PRESCRIBING FAULTS, PRESCRIPTION ERRORS:

Prescribing is the process of deciding what to recommend and designating it. It is the decision-making process. This process may involve types of faults:

- Irrational prescribing
- Overprescribing
- Ineffective Prescribing

The above-mentioned faults form the class of errors which are different in type from the class of errors that can be made during writing the prescription. This leads to the concepts of 'prescription errors' and 'prescription faults' that are distinguished before and mistakenly prescription errors involves both.

Prescription is detailed instructions of the medicines, like what medicine should be given to whom, in what formulation and dose by what route, when how frequently and for how long [9]

Keeping in mind the above-mentioned definition of prescription, the prescription error can be defined as 'a let-down in the prescription writing process that results in incorrect instruction about one or more normal features'. Here, the normal features of the prescription indicate the identity of the recipient, identity of the drug, the preparation and dose and the route, timing, frequency and duration of the administration.

CLASSIFICATION OF ERRORS:

The prescription error can be classified in 2 ways.

Classification I - Per this classification errors can be placed into following categories:

- Contextual Classification (specific time, place, medicines and people)
- Modal Classification (omission, repetition and substitution)
- Psychological Classification

From these classifications, Psychological Classification is the most preferred one as it explains events rather than merely describing them. The only disadvantage of this is that it focuses on human sources more than the system sources of errors [8]

The psychologists this way gives 4 broad types of medication error. Mistakes can be divided into:

(1) Knowledge based errors
(2) Rule based errors

(3) Action based errors

(4) Memory based errors

Knowledge based errors are errors related to type of knowledge, general, specific or expert. For example, knowing that penicillin may cause allergic reactions is a general knowledge; knowing that your patient is allergic to it is specific knowledge and knowing that a drug contains penicillin is an expert knowledge. Ignorance of these facts may lead to knowledge based error.

Rule based errors can be divided into

i. Misuse of a good rule or failure to apply a good rule and
ii. application of bad rule

Action based errors are defined as the performance of an action that was not what was intended. [10]
Technical errors form a subset of action based error. This error occurs when the execution of the action is incorrect [11]

Memory based errors occur when something is forgotten.

Classification II- this classification divides Medication errors in 4 ways:

- Prescribing
- Transcribing
- Dispensing
- Administration

This is again divided following category:

1. Prescribing:

- Incorrect Dose
- Incorrect Route

- Incorrect Patient
- Incorrect Time
- Incorrect Frequency
- Incorrect Drug

2. Transcribing:
- Omit Key information
- Re-writing doses, frequencies, routes or times incorrectly

3. Dispensing:
- Incorrect preparation of the drug or infusion solution.
- Dispense an expired drug
- Incorrect written information on drug label
- Equipment failures
- Labelling Errors
- Incorrect Drug
- Poor drug storage practice
- Drug dispensed too late
- Dispense non-standard drug concentration

4. Administration:
- Incorrect route
- Incorrect dose
- Incorrect time
- Incorrect drug
- Incorrect frequency
- Incorrect patient
- Drug not administered

- Double checking omission
- Prepare incorrect infusant solution
- Set syringe pumps or other equipment incorrectly
- Forget to reset infusion pump
- Written communication error
- Non-compliance failures

NEAR MISS REPORTING SYSTEMS:

A near miss event is any situation which has substantial and possibly serious consequences [16]. This system is widely used in nuclear [17], aviation [18] and chemical industries [19]. The concept behind this system is that some form of regain took place, i.e. prior to negative consequences, the accident event which was initiated was regained either by chance or by the actions of the individual, team or organization. [20]

Administrative culture, reporting structure and quality assurance measures are some of the factors on which the effectiveness of near miss reporting systems and accuracy of data depends.

PHARMACOVIGILANCE:

The pharmacovigilance is defined as the science and activities relating to the detection, evaluation, understanding and prevention of adverse reactions to medicines or any other medicine related problems. It helps to recognize the importance of a systems approach for monitoring and improving the safe use of medicines. [21]

Safe medicines, introduction of medicines into the market and having them survive in the market, the pharmacovigilance should be used as the

crucial and suitable way and should not be perceived as a burden on pharmaceutical companies.

OVERVIEW OF PHARMACOVIGILANCE:

The safety information which has the probability to create an individual case, is coming from various foundations including:

- Clinical Trial Data
- Safety Call Centres
- Natural reports
- Literature Quests

As per the pharmacovigilance policies and regulations each case is assessed, processed in relation to the trial product and are reported to the system and stakeholders.

The data collected is analysed for the safety issues, benefit versus risk and periodic safety update reports (PSURs) and submitted to the regulatory system. This is done for the entire life cycle of the product. The safety findings are reviewed to lessen the risk. The review of safety findings may include modification to a clinical trial design, changes in proposed labelling, application of a risk justification plan or suspension of development or use of a promoted product.

COMPONENTS OF PHARMACOVIGILANCE:

For fully functioning of pharmacovigilance, certain components are essential:

- A competent person
- Safety systems support
- Safety case processing and review

- Medical writing and aggregate reporting
- A quality management system including SOPs, quality standards, metrics and training
- Signal detection and analysis
- Global safety reporting [22]

OBJECTIVE:

To analyse the number of prescription errors occurring in various departments in the period of 6 months i.e. from October 2016 to March 2017 in Indraprastha Apollo Hospitals Delhi.

METHODOLOGY:

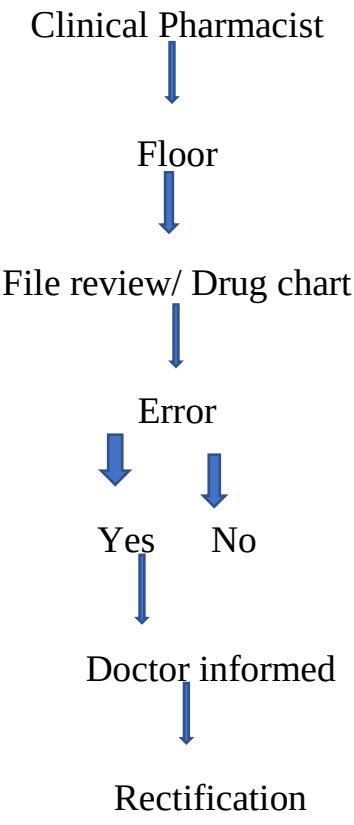
- **Study type**: Retrospective quantitative study.
- **Study/research design:** A form which is used by the clinical pharmacist to record the prescription error is used to collect the data.
- **Study area/setting:** This was an internal survey, conducted within the premises of Indraprastha Apollo Hospitals, New Delhi covering employees from pharmacy.
- **Target Population:** Patients admitted in Indraprastha Apollo Hospitals for 6 months i.e. from October 2016 to March 2017

PRESCRIPTION ERROR RECORDING – PROCESS FLOW:

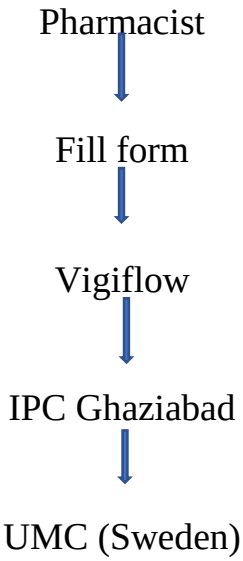
- Prescription errors are recorded from the patient drug chart filled by the doctor who is looking the patient.

- Every morning the clinical pharmacist on duty rounds review the drug chart prescribed by the doctor and check for the prescription error, if any.
- During the review of drug chart, the clinical pharmacist looks for 6 points:
    1. Appropriateness of drug dose, frequency and route.
    2. Allergies, if any.
    3. Therapeutic duplication – 2 medicines are given for same reason with same effects is known as polypharmacy.
    4. Drug-drug interaction and drug-food interaction
    5. Any deviation from hospital; criteria i.e. any drug banned in hospital but is used by the doctor.
    6. Other contraindications.

- If during rounds pharmacist found any of the above-mentioned error in the drug chart, he/she follows a certain criteria of reporting the prescription error.



- The prescription error is also entered into website of Uppsola Medical Centre (UMC)

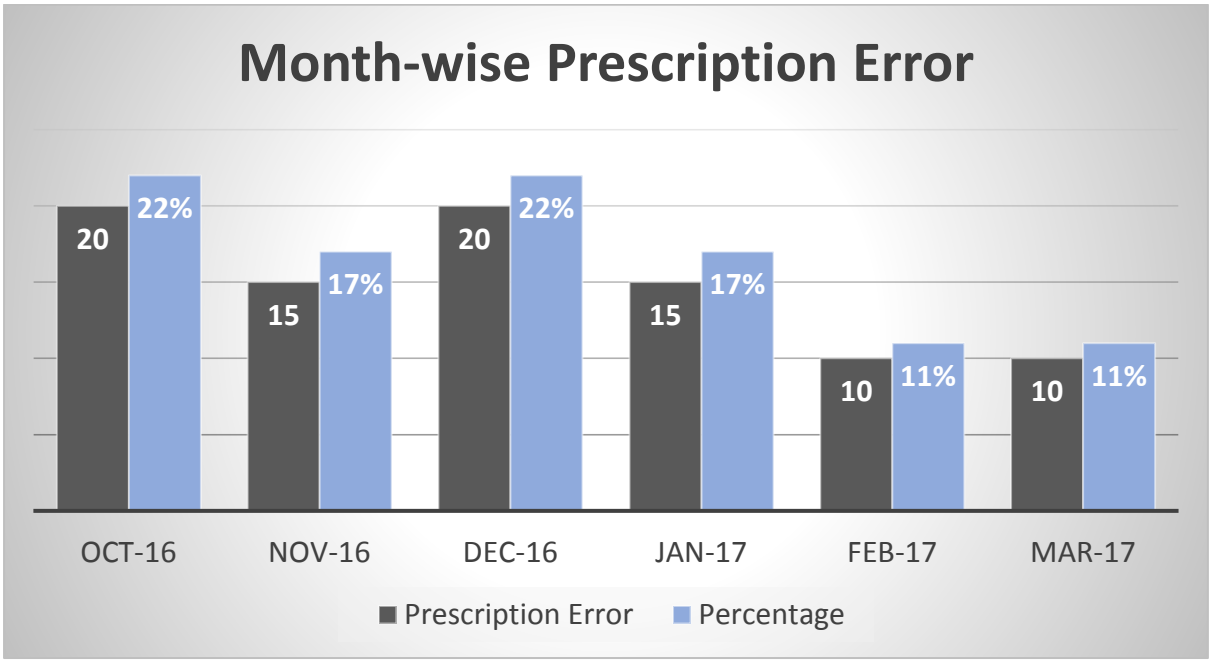


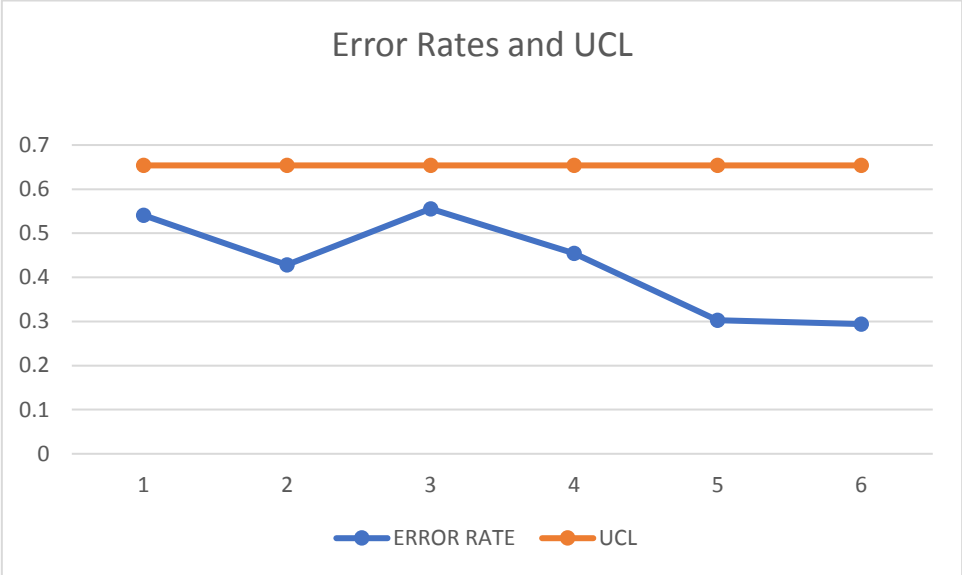
- Following this criteria, the prescription error occurring are reported into the hospital and on the website.

ANALYSIS:

MONTH	P.E	%	TOTAL NO OF DISCHARGES	ERROR RATE	MEAN	UCL
OCT'16	20	22	3700	0.54	0.429	0.65
NOV'16	15	17	3500	0.42	0.429	0.65
DEC'16	20	22	3600	0.55	0.429	0.65
JAN'17	15	17	3300	0.45	0.429	0.65
FEB'17	10	11	3300	0.30	0.429	0.65
MAR'17	10	11	3400	0.29	0.429	0.65
			STANDARD DEVIATION	0.11		

GRAPHS:





INTERPRETATIONS:

The above data and graph mentioned shows the data of last 6 months and the prescription error recorded. The graph depict that the maximum number of prescription error occurred in the months of October and December 2016, this may be due to the new joiners in the ward who are new to the organization and may not be well versed with the prescription writing. And minimum number in the months of February and March 2017, because of proper orientation and induction of the department to the recruit.

The second graph shows that the prescription errors in the last 6 months are within upper control limit (UCL) i.e. they are under control.

RECOMMENDATIONS:

The analysis shows that the Apollo Hospitals follows the safety protocols as per the JCI norms.

Many studies showed that prescription error can be reduced to the great extent by encompassing following points:

1. **Physician work streamlining** – Drug charts to be reviewed and renewed only by doctors looking after the patient during the day time rather than night duty doctor. [12]
2. **Computerized physician order entry** – It is the main element of a experimental data system that allows physician to enter orders directly into a computer for electronic processing, likely recommendations about dosing and checking for duplication and drug-drug interactions. [13]
3. **Clinical decision support systems** – This can be used with Computerized physician order entry as they include any knowledge based tool integrated into clinician workflow and patient data to improve quality care [14]
4. **Medication Reconciliation** – According to Pronovost and colleagues, the repetitive use of this discharge survey prevented an average of 10 medication errors per week [15] Maintaining the list of patients which include long-standing medications, reason for the new medication, termination dates for the medication, history of old medication- held or stopped may progress patient safety.

5. **Pharmacists participation** – For improving the care quality for the patient, skills and knowledge of the pharmacists especially for the patients with several risk issues or different pharmacokinetics should be used.
6. **Medication standardization** – Protocols for medication system should be developed to ensure the patient safety. The implementation of standard protocol system can reduce the percent of medication errors occurring in the hospital.

CONCLUSION:

- The prescription errors are preventable, if monitored properly. According to the observations made, the prescription errors were more in certain time period which may be due to the number of reasons, which includes new recruitments, poor patient history, lack of communication between the doctor and nurse or the implementation of new drug system in the organization.
- On the other hand, observations show that the variation in the error rate is not significant, which concludes that the preventive measures are used to control the prescription error.
- The observations were made keeping in mind the discharges in the month and the mean of the error rate. The upper control limit was extracted using the standard deviation. The upper control limit depicts the range of the acceptable errors, beyond this limit drug system need to be reviewed for reducing the error rate.

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PROJECT# 3

STANDARD OPERATING PROCEDURES

INTRODUCTION:

A Standard Operating Procedure (SOP) is a set of written instructions that document a routine or repetitive activity followed by the organization. The SOPs are the most important and integral part of the organization as it provides individuals with the information to perform a job properly and facilitates consistency in the quality of work. SOPs are policies, procedures and standards you need in the operations, marketing and administration disciplines within your business to ensure success. These can create:

- Efficiencies and therefore profitability
- Consistency and reliability in production and service
- Fewer errors in all areas
- A way to resolve conflicts between partners
- A healthy and safe environment
- Protection of employers in areas of potential liability and personnel matters

PURPOSE:

The purpose of the SOPs is to provide the detail of the work process that is done or followed in the organization. SOPs are specific to the departments and organization facilities whose functions are described and assist to maintain quality control and assurance. The use of SOPs demands to be reviewed and reinforced by the supervisors. The electronic format or the hard copies of SOPs should be accessible in the departments for the reference purpose.

BENEFITS:

SOPs helps in minimizing variation in the departments and promotes quality with consistent implementation of the procedures in the organization. They can be

used as a part of personnel or departmental training as they provide detailed work instructions. They also minimize the chances of miscommunication and enhances safety. They help in reducing work effort, improves comparability, credibility and legal defensibility.

WRITING STYLES:

SOPs should be written in a crisp, step-by-step, and easy-to-read format. Information presented should be definite and should not be complex. The active voice and present verb tense should be used. The term 'you' should not be used, but obscure. The document must not be rambling or over extensive. It should be concise. Information presented should be clear and flexible to clear doubts. Flow charts can be used to demonstrate the process being mentioned. Style guide used by the organization is preferred.

PROCESS OF SOP

SOP PREPARATION:

The organization should have a procedure to determine what procedures or processes are to be documented. SOPs are written by the individuals with high knowledge of activities and organization's internal structure. These individuals are experts who use the process or perform the work. A team approach can also be tracked, especially for processes including multi-tasking where the experiences of a number of individuals are dire, that promotes "buy-in" from budding users of SOP.

SOPs should be written in detail that person with limited experience or knowledge about the procedure can be benefited. There should be a column mentioning experience requirement to perform that particular procedure or activity.

SOP REVIEW AND APPROVAL:

SOPs should be reviewed by a team of individuals with apt training and experience with the process. It is especially helpful, if draft SOPs are tested by the individuals than actual writer before getting them finalized.

Finalized SOPs should be approved by the authorities or supervisors. Signature approval indicates that an SOP has been both reviewed and approved by the management. As per the Government Paperwork Elimination Act of 1998, use of e-signatures, as well as e- maintenance and submission, is an acceptable substitution of paper.

FREQUENCY OF REVISIONS AND REVIEWS:

Whenever procedures are changed, SOPs should be modernized and reapproved. Appropriate section of an SOP should be modified, if desired. There should be a change in date/revision number for the section with table of contents and the document control system.

SOPs should also be reviewed on intermittent basis. The review date should be there. Process which is no longer followed should be withdrawn from the existing file and archived.

The frequency of the review of the SOPs should be indicated by management in organization's quality.

CHECKLISTS:

Many of the procedures use checklists to ensure that steps are followed in order and are also used to document completed actions. Any checklist or form included as part of a procedure should be referenced at the points in the procedure where they are to be used and then attached to the SOP.

In some cases, there are specific detailed checklists for a given procedure. The SOP should describe about how the checklist is prepared, or on what it is to be

based. Copies of the specific checklists should be maintained in the file with results of the procedure and/or with the SOP. It is important to know that checklist is a part of SOP, not SOP.

DOCUMENT CONTROL:

Every organization should develop a numbering system to systematically identify and label the SOPs, and the document control should be mange by Quality Management Plan. Generally, every page of SOP should have control documentation notation as-

Short Title/ID#

Rev. #:

Date:

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A short title and ID number can serve as a reference designation. Revision number and date helps in identifying the SOP in use when the procedure is being reviewed. Page numbers helps in checking of completion of the SOP. This notation is generally located on the upper-right corner of the document.

SOP DOCUMENT TRACKING AND ARCHIVAL:

Organization must maintain a master list of all SOPs. That file/database should indicate the SOP number, date of issuance, title, author, status, organizational division, branch, section and about the past versions of current SOPs.

FORMAT OF SOP

1. INTRODUCTION – Introduction includes the information and definitions about the procedure.
2. PURPOSE – SOP provides guidelines for performing the procedure to the latter coming for the same.

3. SCOPE
4. PATIENT PREPARATION
5. PROCEDURE
6. AFTER PROCEDURE CARE