Dissertation in
National Heart Institute
(2nd February 2017 to 30th April 2017)

A Report
On

Time and Motion study in Indoor Pharmacy

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(A) Introduction

The journey of a thousand miles begins with one small step and that was taken in 1981 when National Heart Institute (NHI) opened its portals as the Nation's First Dedicated Cardiac Care Institute and the First Private Sector Cardiac Catheterization Laboratory outside the developed world at that time. National Heart Institute (NHI), brain child of doyen of Cardiology in India, Dr. S. Padmavati, was established in 1981 under the aegis of the All India Heart Foundation (AIHF), research and treatment of heart ailments. Inaugurated by the late Prime Minister, Mrs. Indira Gandhi, NHI is a landmark super specialty health destination in India. This 104 – bedded tertiary care hospital renders some of the sophisticated and most advanced state of art specialized medical services at affordable cost. NHI was established with the aim of providing State-of-art Modern Cardiac Care Technology to the financially poor section of the society. It was planned to be a self sufficient, stand alone facility and as a result it was decided that people with paying capacity should also be taken up and the surplus generated from them be used for the treatment of the poor.

Towards the goal of transplanting health and happiness, NHI is staffed by a team of committed and value driven medical professionals, whose endeavour is to provide the ultimate in modern-day medical care for we believe in 'Together we care ... as no one has ever done before'.

The NHI is the Research & Referral tertiary care Heart Hospital of the AIHF, which acts as a center for diagnosis and treatment of heart ailments and allied diseases and is equipped with state of the art equipments. Surgical services include all kinds of closed and open Heart Surgeries like Coronary Artery Bypass Surgery, off pump bypass surgery (beating heart surgery), valve repair & replacement surgeries, aortic / carotid surgeries, congenital heart surgeries including blue babies and minimally invasive (Key hole) surgeries. It has modern Cath lab facilities where procedures

like Angiographies, Angioplasties, Stenting of the Coronary arteries, valvotomies correction of birth heart defects and closure of holes of the heart, Electrophysiological studies, Radio Frequency ablation, Rotablation, Intra-vascular ultrasound, pacemaker and internal defibrillator implantation are carried out. Highly qualified staff, trained in India & abroad, with wide experience in Cardiology & Cardiac Surgery service these areas.

Apart from indoor treatment, the Institute also provides all-inclusive medical check-up, i.e. Executive health check-ups, at nominal rates with a view to ensuring good physical conditioning and health of all individuals. Cardiac patients with other ailments are also admitted to this hospital, as specialists for diseases other than heart are available round the clock for consultation and treatment.

The Institute has been known for open heart surgeries, coronary artery bypass surgery, angiography and angioplasties and other specialized cardiac treatment by the Central Govt. Health Scheme (CGHS), Employees State Insurance (ESI), Employee Contributory Health Scheme (ECHS), besides the Governments of Himachal Pradesh, Haryana, Madhya Pradesh, Mizoram and Govt of NCT of Delhi. Ministry of Defence, Office of the Director General of Armed Forces Medical Services and Directorate General of Medical Services Naval Headquarters have recognised NHI for treatment of their employees and their families. 122 Public sector bodies, almost all the TPAs and International Organisations like World Health Organization (WHO) & UNICEF are also empanelled with the NHI.

To maintain its culture of service to the humanity, NHI carries out regular Community outreach programmes (heart camps) and also ‘Executive Health Checkups’ and ‘Employment Checkups’ to detect cardiac problems early and take corrective action.

NHI is recognized by National Boards for post doctoral training and runs an active teaching and training programme in the specialties of Cardiology & Cardiovascular & Thoracic Surgery. It also carries out research in all aspects of Cardiology & Cardiac Surgery.

NHI is recognized as a Collaborative Centre of WHO in Preventive Cardiology since 1983. It is an affiliate of the World Hypertension League and Heart Beat International.

NHI lays extraordinary emphasis on "Lifestyle Disorders" and caters to outdoor consultation, education and counseling on Diabetes, obesity, cholesterol related diseases, thyroid disorders, alcohol and smoking. Indoor care for Diabetes & Lifestyle disorders are taken care of. The hospital has a department of Pulmonology and Sleep Medicine which is equipped with sophisticated machines and is staffed by devoted Pulmonologists, Thoracic Surgeons and Physiotherapists.

10% indoor beds are dedicated for poor patients having monthly income of Rs.4000/- and less and the hospital regularly grants free treatment to such patients and lots many at subsidized rates. The hospital also runs free OPDs for two hours on all working days.

Scope of Services

CLINICAL SERVICES:- • Anaesthesiology • Cardio Vascular Thoracic Surgery • Cardiology Including Interventional • Dental Sciences • Emergency Medicine • General Surgery • Nephrology Including Dialysis • Nuclear Medicine • Orthopaedic Surgery • Respiratory Medicine • Urology • Vascular Surgery	**DIAGNOSTIC SERVICES**:- • Ct Scan (Outsourced) • Holter Monitoring • Tread Mil Teasting • Ultrasound • Urodynamic Studies • X-Ray (Outsourced)
LABORATORY SERVICES:- • Clinical Biochemistry • Clinical Pathology • Haematology • Serology	**TRANSFUSIONS SERVICES**:- • Blood Transfusions Services • Blood Bank
PHARMACY:- • Dispensary **PROFESSIONS ALLIED TO MEDICINE:-** • Physiotherapy	**SUPPORT SERVICES:-** • Ambulance

NHI LOGO

NHI VISION

"To create long term relationships by caring as no one has done ever before"

NHI MISSION

"To provide superior, compassionate and innovative cardiac care to prevent and treat disease maintaining highest standards in safety and quality"

Managerial tasks performed

As a part of my dissertation, I was interning at National Heart Institute, New Delhi from 2ND February- till date. With the exposure and my training at the hospital, following are my Job Responsibilities, Task performed as management trainee and Reflective learning's in the Quality Department during the dissertation period.

Job Responsibilities

1. Assisting the Quality Assurance and operations Executive
2. Promoting the quality drive through the organization.
3. Assisting in documentation of SOP's / Quality Policies and Manuals / Minutes of meetings for different departments
4. Making PowerPoint presentations in preparation and holding of Training classes.
5. Helping in collection of data of quality indicators and making the reports for the same.
6. Assist in different coordinating different committee meetings and when scheduled.
7. Assist in various audits and thereafter documentation and analysis.
8. Any other patient care and operation/quality aspects so assigned.

Tasks Performed as Management Trainee-:

1. Scrutinizing patient feedback forms fortnightly and information captured thereby. Circulation of gray areas and notifying to the concerned heads/in charges.

2. Coordinating with quality cell with regards to capturing quality indicators pertaining to patient satisfaction.

3. Monthly audits/ stock Checks of general store, pharmacy and various sub stores. Thereafter documenting the surplus/deficient items found and doing analysis.

4. Looking after staff discipline- personal tidiness and turnout etc.

5. Round of patient care (ICCUs/Wards) and related areas (patient kitchen) on daily basis and making note of observations with regards to floor discipline, discrepancies and other aspects / issues which needed improvement.

9. Verifying attendance for the housekeeping and security staff (outsourced) on monthly basis.

10. Verifying monthly dietary bills of the patient (outsourced department).

Part-II

Dissertation on "Time and Motion study in Indoor Pharmacy"

EXECUTIVE SUMMARY

Pharmacy is an important part of the hospital as it acts as a major department for the treatment of the patient. The main purpose of the pharmacy is to provide the medication for the patient on time. The purpose of the study is to understand the process flow from prescription of medicine by the consultant in the wards to dispensing of the correct medicine at the nursing station, to identify the bottlenecks in the process flow which lead to delays in the process, recommend measures which can be adopted to streamline the process and also suggest the ideal indenting which can be done. Unstructured interview of senior pharmacist and nursing staff of the respective areas is taken. The time taken for the whole process was more than an hour which leads to delays in the administration of the

drug to the patient which will result in the late recovery leading to fail in providing quality service. The entire process should not take more than 20-25 minutes as after the consultant rounds in the morning the morning dose should be immediately given. And if one dose is delayed, will result in delaying of afternoon and evening dose as proper time gap should be there for the administration of the two doses.

INTRODUCTION

The mortar and pestle are one of the internationally recognized symbols to represent the pharmacy profession. Pharmacy is the health profession that links the health sciences with the chemical sciences and it is charged with ensuring the safe and effective use of pharmaceutical drugs. The word derives from the Greek “pharmakon” meaning "drug" or "medicine” The scope of pharmacy practice includes more traditional roles such as compounding and dispensing medications, and it also includes more modern services related to health care, including clinical services, reviewing medications for safety and efficacy, and providing drug information. Pharmacists, therefore, are the experts on drug therapy and are the primary health professionals who optimize medication use to provide patients with positive health outcomes. Hospital pharmacy is an important department and one of the major revenue generating area in hospital catering both inpatients and outpatients. Inpatient is one who is admitted to the hospital for at least overnight bed

occupancy. Whereas outpatient is one who receives treatment or consultation on the premises including emergency room, but is not an inpatient. Main role of pharmacy is to deliver right medicine to right patient on right time at right price, which very important aspect of quality patient care as its brings out various benefits like rapid cure, less length of stay etc

REVIEW OF LITERATURE

- A time motion study in OPD clinic of a rural hospital of West Bengal in 2014 , was conducted by Dr. Mannal, Dr.Samsuzzaman , Dr. Das , to know the time taken in different service delivery points in outpatient department and to assass the perception of beneficiaries regarding the total time spent in the OPD.the study was conducted at Tarakeswar rural hospital from January to April 2014.
- A Time Motion Study of the Patients Attending The Outpatient Departments of a Tertiary Care Hospital in Kanchipuram, Tamilnadu was conducted in 2014 by Venkatesh, Renuka, Prakasam , P.Siva, Bhuvaneshwari.
- Eliciting time motion study with involved pharmacist interventions in an emergency department of tertiary care hospital was conducted in 2013 by J.Areej and J.Rabia

PROBLEM STATEMENT

In order to provide timely patient medication, there is a need to have an ideal indenting of medicines so that the medicines are administered to the patient on time. However due to various waste present in the process flow, the medicines are administered late as per the scheduled time which hampers the treatment

OBJECTIVES

- To identify the bottlenecks present in the actual process flow of indoor pharmacy
- To suggest remedial measures to avoid the waste will help in dispensing of medicine on time
- To suggest an ideal indenting of medication of patients to pharmacy

PREVIEW

- **In NATIONAL HEART INSTITUTE**, the average number of IPD prescription raised is about 150 per day, so per hour there will about 20 prescriptions. The number of pharmacist working per shift will be 3 in indoor pharmacy (1 senior pharmacist and 2 junior pharmacists) and one ward staff to dispense the medicine.

The pharmacy receive prescription from various department as follows

WING-A	WING-B	WING-C
First Floor	**First Floor**	**First Floor**
ICCU-I	Nursing Station 1	Nursing Station 1
ICCU-II	**Second Floor**	**Second Floor**
ICCU-III	Nursing Station 2	Nursing Station 2
ICCU-IV		**Third Floor**
		Nursing Station 3

Prescription Slip Raising

- In the Morning hours prescription slips are made just after the consultant rounds are over.
- Returns of medicine can be raised at any hour

Process flow

Step 1:Prescription of medicine by the consultant

Step 2: Consultant writes prescription in the treatment sheet

Step 3:Nurse Incharge handovers the sheet to the nurse to write prescrption on prescription slip

Step 4:Nurse writes prescription on prescription slip and gives it to ward staff

Step 5:Pharmacist receives the prescription slip.

Step 6:Pharmacist bills medicine on patient's name in HMIS

Step 6:Pharmacist collects the medicine and pack in a bag

Step 7:Pharmacy ward staff take it in the basket or trolley to the ward station

Step 8:Nurse checks the medicine and put it on patient's table.

The flow chart diagram is attached in Annexure A

METHODOLOGY

Data collection

Data was collected from ICCU-I, ICCU-II, Nursing Station 1(B-WING) and Nursing Station 2 (C-WING) and also from the pharmacy. Sampling method used was convenience sampling. Convenience sampling because every prescription slip made from IPD didn't had the equal chance of getting selected for the data collection, as if data collector is busy collecting the data for one patient, it would be difficult for him to collect the data for every

new prescription made by the consultant new prescription slip coming from any department to pharmacy. Hence sampling is Convenience sampling.

Tracking the process

- Prescription Of Medicine
- Writing prescription in prescription slip
- Prescription slip received by Pharmacist
- Medicines Collected and packed
- Dispatching from Pharmacy by staff/ ward staff
- Dispensing to Nursing Station

Sample size

Sample size: 100

ICCU-I: 25

ICCU-II: 25

Nursing Station 1(B-WING): 25

Nursing Station 2 (C-WING): 25

These samples for 100 patients were collected over a period of 4 weeks from March 27th 2017 to April 22nd 2017

Data Analysis

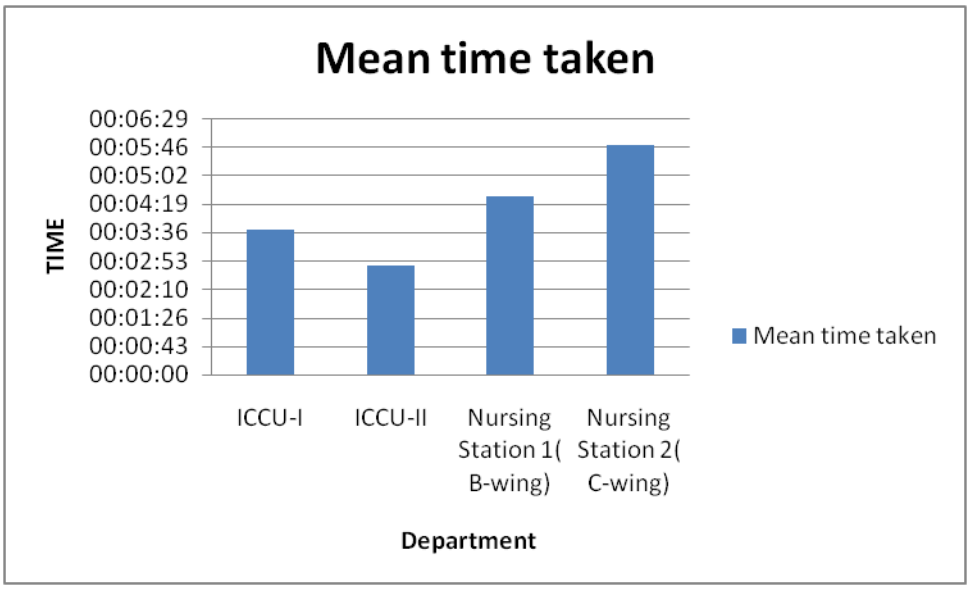
- **Step 1:**

Time taken from prescription of medicine to writing in prescription slip

TABLE1.1

Department	Mean time taken
ICCU-I	00:03:41
ICCU-II	00:02:46
Nursing Station 1(B-wing)	00:04:32
Nursing Station 2(C-wing)	00:05:50

FIGURE (A)



The above graph depicts, in nursing station 2(c-wing) more time is taken from prescription of medicine to writing in prescription slip followed by nursing station 1(B-wing), ICCU 1 and ICCU 2

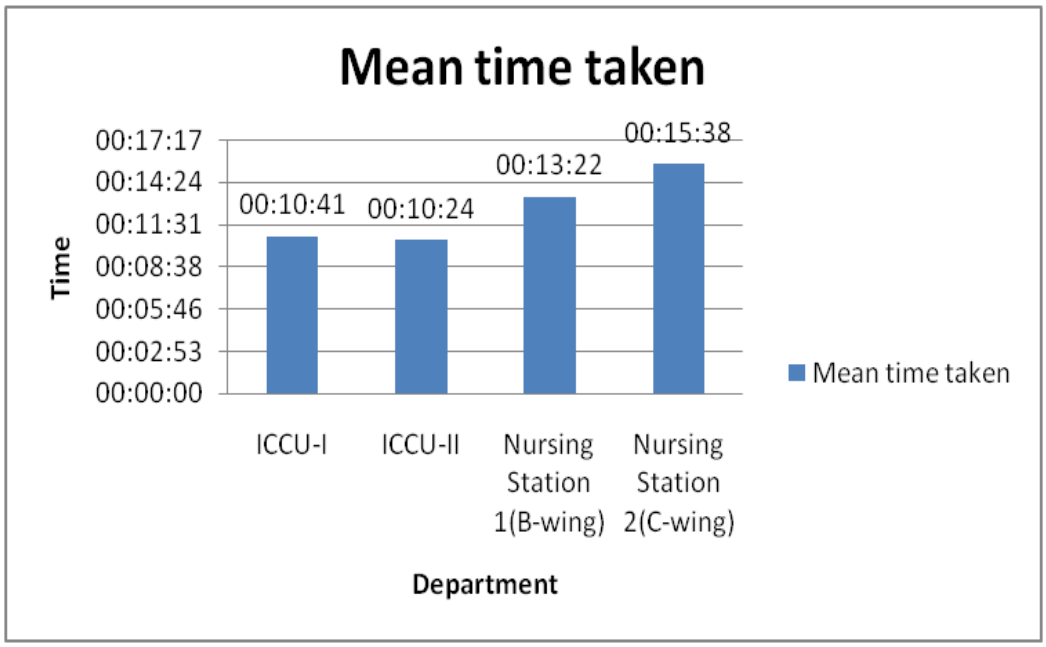
- **Step 2:**

Time taken from writing prescription in prescription slip by nurse to receiving of prescription slip in the pharmacy

TABLE 1.2

Department	**Mean time taken**
ICCU-I	00:10:41
ICCU-II	00:10:24
Nursing Station 1(B-wing)	00:13:22
Nursing Station 2(C-wing)	00:15:38

FIGURE (B)



The above graph depicts, in nursing station 2(C-wing), more time is taken from writing of prescription slip to receiving of prescription slip in pharmacy

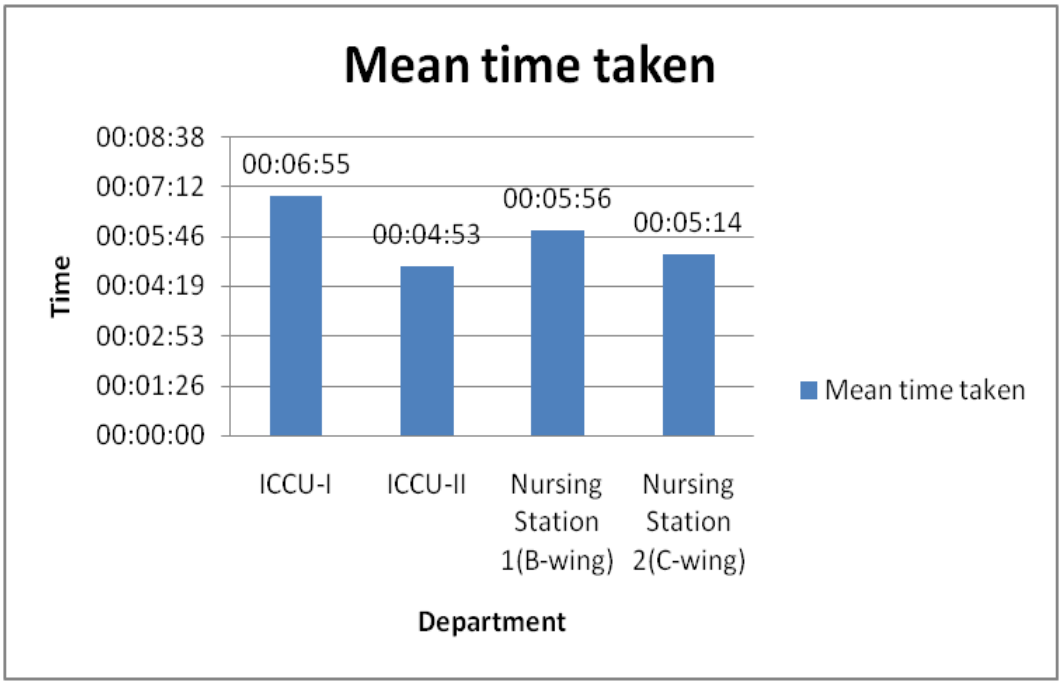
- **Step 3:**

Time taken from receiving of prescription slip in pharmacy to collection and packaging of medicine

TABLE 1.3

Department	**Mean time taken**
ICCU-I	00:06:55
ICCU-II	00:04:53
Nursing Station 1(B-wing)	00:05:56
Nursing Station 2(C-wing)	00:05:14

FIGURE(C)



The above graph depicts, for ICCU 1, more time is taken from receiving of prescription slips to collection and packaging of medicine followed by nursing station 1(B-wing), nursing station 2(C-wing) and ICCU-II.

❖ **Step 4:**

Time taken from packaging of medicine to dispatching of medicine from the pharmacy

TABLE 1.4

Department	**Mean time taken**
ICCU-I	00:15:26
ICCU-II	00:14:26
Nursing Station 1(B-wing)	00:13:11
Nursing Station 2(C-wing)	00:15:29

FIGURE (D)

The above graph depicts, more time is taken for dispatching of medicine from pharmacy in nursing station 2(C-wing) followed by ICCU-I, ICCU-II and nursing station 1(B-win

- **Step 5:**

Time taken from dispatching of medicine from pharmacy to dispensing it at the nursing station

TABLE 1.5

Department	**Mean time taken**
ICCU-I	00:10:50
ICCU-II	00:07:53
Nursing Station 1(B-wing)	00:10:43
Nursing Station 2(C-wing)	00:11:02

FIGURE (E)

The above graph depicts, more time is taken for dispatching of medicine in nursing station 2(C-wing) followed by ICCU-I, nursing station 1(B-wing) and ICCU-II

Turn Around time

The turnaround time department wise is as follows

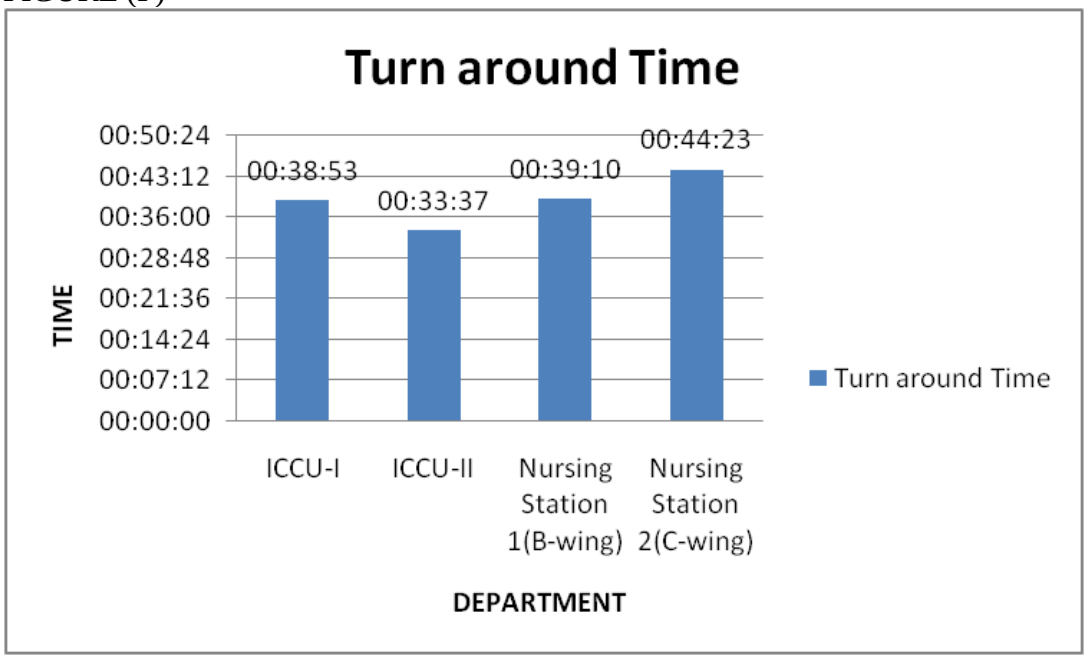
ICCU-I: 00:38:53

ICCU-II: 00:33:37

Nursing Station 1: 00:39:10

Nursing Station 2: 00:44:23

FIGURE (F)



According to the above graph, turnaround time for Nursing station 2(C-wing) is more as compared to other three departments.

Reason for delay

- Reason for delay in Step-1 (Prescription –Prescription Writing)
  - Consultant is busy with the second patient
  - Preparing the discharge file of the other patient
- Reason for delay in Step-2 (writing prescription – Receiving prescription slip)
  - Pharmacist taking returns of the medicine from IP

- Brand as prescribed not present
- Medicine out of stock
- New prescription slip not made for the substitute and modification in the prescription slip pending
- Drug strength not present
- Wrong order quantity
- Calling at the nursing station to ask for substitute-Communication gap

➢ Reason for delay in Step-3 (Receiving prescription slip – packing)

- Pharmacist busy with other orders
- Time taken in searching for the medicine

➢ Reason for delay in Step-4 (Packing- Dispatching from pharmacy)

- Ward staff not present
- Waiting for minimum 8-10 orders to be dispatched at the same time

➢ Reason for delay in Step-5 (Dispatching- Dispensing at nursing station)

- All the nursing stations from where prescription are raised have to be covered
- Nurse not present at the nursing station to receive the medicine

Recommendation

Step-1 (Prescription –Writing Prescription)

- Treatment sheet can be made on the system and the indents can be directly raised by the nurse in HMIS
- Indents can be directly raised from the nursing station by the nurse.

Step-2 (Writing prescription- Receiving Prescription slip)

- Returns of the medicine should be done within 24 hours of change in medicine
- Drug brand consensus by the consultants and to be followed strictly
- Restricting various brands and keeping only one brand
- Time for the 24 returns should be in afternoon
- Bar coding system in pharmacy

Step-3 (Receiving Prescription– packing)

- Proper labeling in pharmacy for the medicines
- Training of staff for the location of various medicines
- Returns should not be entertained at any hour unless it's the case of discharge of patient.

Step-4 (Packing- Dispatching from pharmacy)

- Increase in the ward staff for dispensing the medicine
- Separate ward staff for both 1st and second floor

Step-5 (Dispatching- Dispensing at nursing station)

- Ward staff for each floor should be separate

Limitation of the study

This is a study with convenience sampling; hence it will be difficult to check all the prescription slips rose per day. However, timelines are real and reasons of delays are true for all the cases as process for all the cases is more or less same. One more limitation will be that, there were certain patients who were seen by more than one consultant and some patients were seen by same consultant twice, so the prescription slip for the same patient can be raised even twice or thrice a day.

Problems Faced

It was difficult to follow a case as it required almost 1hour from prescription to dispensing. In some cases where medicine was not available the purchase order was raised. It took almost 2 hours for the medicine to be dispensed in the hospital, So the data got varied due to these cases.

Conclusion

From the above study it is evident that the time taken for dispensing of the medicine is around one hour, which should be 20-25 min. Most of the time is consumed in receiving of prescription slip in pharmacy and in dispatching of medicine in the respective area. There is scope for improvement in the Nursing Station 2(C-Wing) and pharmacy department. In rest of the three departments also {ICCI-I, ICCU-II and Nursing Station 1(B-Wing)} there is delay in dispensing of medicine form pharmacy. If the process has to be streamlined the reasons for delays have to be looked for so that from individual level the work is done as soon as possible.

Reflective Learnings:

1. Understanding the general working of various hospital departments.
2. Man power management in terms of Housekeeping and security staff.
3. Coordination regarding various quality initiatives within the hospital
4. Documentation related to NABH and other related documents.
5. Timeliness, patient focused approach.
6. Reviewing of all the quality manuals and procedures.
8. Regular training of nurses and other staff (housekeeping, security, dietary) related to fire safety, biomedical waste management, emergency codes etc.
9. Recording of each and every event (sentinel/adverse, patient fall, disaster/emergency).
10. Adhering to Quality Management process.
11. Taking action when a non-conformance is detected.
12. Developing Team spirit, leadership and motivation among the staff.

Annexure A

PROCESS FLOW

(Emergency) (Non-Emergency)

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