Study on Prescription Bounce in OP Pharmacy at Manipal Hospital, Jaipur

By

Shruti Gangal

Dissertation submitted for the partial fulfillment of the

MBA Hospital and Health Management

Academic year, 2016-2018

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

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Shruti Gangal** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at **Manipal Hospital** from **5th February 2018 4th May 2018.**

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

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.

17/5/18

Col (Dr.) Ashok Kaushik
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ManipalHospitals
LIFE'S ON

The certificate is awarded to

Dr. SHRUTI GANGAL

In recognition of having successfully completed her Internship in the department of

OPERATIONS

and has successfully completed her Project on

1. **STUDY ON BOUNCE PRESCRIPTIONS IN OPD PHARMACY AT MANIPAL HOSPITAL, JAIPUR**
2. **PLANNING A DIABETIC FOOT CARE CLINIC AT MANIPAL HOSPITAL, JAIPUR**

From 5th Feb. 2018 – 4th May 2018

At

MANIPAL HOSPITALS, JAIPUR

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavors

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A Unit of MHEPL

Mr. Siva Kumar Pothuraju
Human Resources

Sudeep Singh
Head of Department

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **A Study on Prescription Bounce at OPD Pharmacy at Manipal Hospital** and submitted by **Dr. Shruti Gangal** Enrollment No. **IIHMR-U/01/2016-2018/0498** under the supervision of **Dr. Ruchi Garg** for award of MBA in Hospital and Health Management of the University carried out during the period from **5th February to 4th May 2018** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.

Shruti 22/5/2018

Signature

ACKNOWLEDGEMENT

The successful completion of the dissertation and final outcome of this project required a lot of guidance and assistance from different people and I consider myself fortunate to have so many people around to guide me.

First and foremost I would like to thank **Col. (Dr.) Ashok Kaushik** (Dean Academics and Student Affairs, IIHMR, Jaipur) for providing such a great learning opportunity. I owe my profound gratitude to **Mr. Sudeep Singh** (Head Operations, Manipal Hospital, Jaipur) for guiding me and always adding value to my understanding about the different departments in the hospital. I'd like to extend my sincere thanks to **Dr. Harikant Singh** (Medical Superintendent) for his help in further nurturing my understanding about the hospital and its working.
I am also thankful to each and every staff of **Manipal Hospital, Jaipur** for sharing their experiences and knowledge and providing their precious time to add value to my knowledge. Without their cooperation, the dissertation and the project work would not have been possible.

Finally, I would like to extend my sincere regards to my mentor **Dr. Ruchi Garg** (Asst. Professor, The IIHMR University Jaipur) for all her support and guidance.

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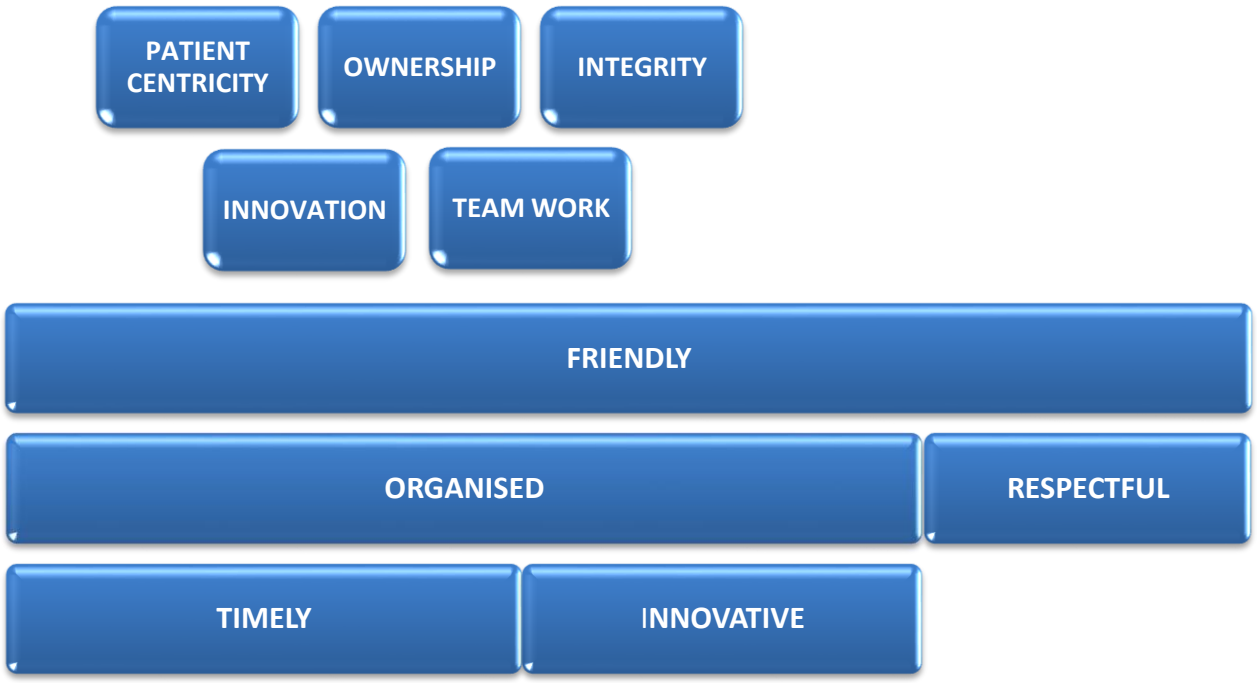
HOSPITAL OVERVIEW

Manipal Hospitals Jaipur

"**A world class network of healthcare establishments in India"**
Manipal Hospitals is part of the Manipal Hospital Enterprises Private Limited (MHEPL), which pioneers in the field of education and healthcare delivery.
A social seed sown more than five decades ago is today the country's largest healthcare group with a network of 15 hospitals and three primary clinics providing comprehensive care that is both curative and preventive in nature for a wide variety of patients.
The focus at Manipal Hospitals is to develop an affordable tertiary care multispecialty healthcare framework through its entire delivery spectrum and further extend it to homecare.
The ethos of Manipal Hospitals is its belief in the credo of its triad of core values namely "Clinical Excellence, Patient Centricity and Ethical Practices" which have led to it becoming one of the best and most trusted healthcare providers in the country today. Our Clinical Excellence is rooted in our excellent team of doctor's medical specialists who are well versed with the latest advancements in their respective field of medical expertise. This is further complemented by our teams of highly trained nurses and paramedical people. Besides this, our unwavering and unflinching belief in Ethical Practices along with our social initiatives through the Manipal Foundation and other associates NGOs has enables us to extend quality and affordable healthcare to the lesser privileged sections of our society.

With its flagship quaternary care facility located in the heart of Bangalore city, five tertiary care, nine secondary care and three primary care clinics across five states, today Manipal Hospitals successfully operates and manages 4,900 beds and caters 2 million customers from India and overseas every year.

MANIPAL VALUES



Vision of Hospital:-

"Globally respected Healthcare organization recognized for clinical excellence & distinctive patient care."

Mission of Hospital:-

"To be the preferred super specialty healthcare provider of international standards known for patient centric care & Clinical excellence through continual improvement of process & outcomes.

Quality Policy:-

To create a world class integrated health care delivery system in India, entailing the finest medical skills combined with compassionate patient care.

Focus of Hospital:-

To develop an affordable tertiary care multispecialty healthcare framework through its entire delivery spectrum and further extend it to homecare

Floor wise Facility Distribution:-

GROUND FLOOR

- General Ward 1
- General Ward 2
- AC General Ward
- Dialysis
- Reception
- Emergency
- OPD
- Cafeteria
- Health Checkup
- Sample Collection Room
- OP Pharmacy
- Mortuary
- Labor Room
- Emergency Day Care

CONSULTATION (OPD)

- Allergy and Asthma
- Anesthesiology
- Banatric Surgery
- Blood Bank
- Cardiac Anesthesia
- Cardiology
- Cardiothoracic and Vascular Surgery
- Critical Care
- Dental
- Dermatology
- Diabetology and Endocrinology
- Emergency Medicine
- ENT
- General Medicine
- Hepato Pancreato Biliary Surgery
- Infectious Diseases
- Medical Gastroenterology
- Medical Jurist
- Neonatology
- Nephrology and Dialysis

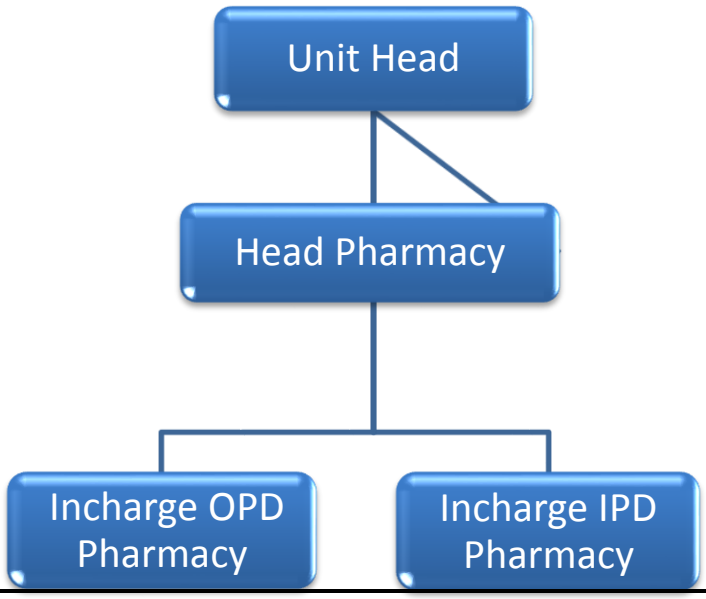
- Neuro Surgery
- Neurology
- Nutrition and Dietetics
- Obstetrics and Gynecology
- Oncology
- Ophthalmology
- Orthopedic and Joint replacement
- Pediatric
- Pediatric Surgery
- Physiotherapy
- Plastic and Reconstructive Surgery
- Psychiatry
- Radiology
- Respiratory Medicine
- Sleep medicine
- Spine Surgery
- Surgical Gastroenterology
- Urology

1. **OP PHARMACY**

Objectives:-

- Indenting and receiving the material.
- Storage (Stock) of material.
- Issuing and dispensing.
- To follow sound inventory practices.
- Code approval for new medicines.
- Following statutory compliances according to NABH standards.
- Providing Hassle-free, on time services to OPD patients.

Organogram:-



Functional Division:-

	FUNCTIONAL AREAS	
1	Receiving Area	3 counters are present in OP pharmacy
2	Dispensing area	**2 Counters**
3	Storage Area	

TITLE : A STUDY ON PRESCRIPTION BOUNCE AT OPD PHARMACY AT MANIPAL HOSPITAL

INTRODUCTION

In the present human services condition, Services and dynamic exercises of doctor's facility drug store are influencing general wellbeing and welfare. The forte is relied upon to be better, more grounded, and speedier than previously. Outpatient pharmacy is a segment of healing facility drug store division that is required to give the accompanying extent of administrations and exercises to doctor's facility clients:

- Delivery of prescription related administrations to outpatients and human services suppliers working inside healing facility premises.

- Generation of solicitations for installment as per concurred installment frameworks

- Medication compromise.

- Offering retail offer of wellbeing related materials

- Handling and overseeing patients overabundance or old prescription

- Documentation of every day drug store hone.

The general adequacy of any therapeutic revealing instrument is fixing to its capacity to fill in as a technique for correspondence of information, thoughts, and ideas in an unmistakable and unambiguous mold. Notwithstanding these utilitarian prerequisites, various down to earth and specialized necessities ought to be considered; which include components of convenience, security, privacy, availability, transmission, and confirmation.

During the internship at Manipal Hospital it was suggested by the mentor to have the basic overview of operations and functioning of some of the clinical as well non clinical departments to understand departments of the Hospital. Based on which it was inferred that the OPD pharmacy works with a Token Management System, the Token machine for which was placed near the medicine dispensing counters.

BACKGROUND

Outpatient pharmacy is an extremely critical supporter of the general monetary accomplishment of the clinic. Absence of retail ability is a typical issue in wellbeing framework drug store tasks.
There are chances to drive new incomes through better stock administration, enhancing the outpatient drug store administration, endorsing and administering of solutions, dealing with the release remedies and crisis division fills. Notwithstanding all these, increment in quiet fulfillment and diminished readmissions with better medication consistence following meeting/release.

Prescription bounce from the OPD Pharmacy is often seen to affect the overall revenue generation from the outpatient pharmacy of the hospital. The patients coming into the hospital for consultation, tend to purchase all the prescribed medicines from the OPD pharmacy and any sort of shortage of supply of a medicine or unavailability of a medicine causes distrust among the patients. The more the unavailability of drugs at the hospital pharmacy, more will be the loss of probable revenue which could have been generated having dispensed all the medicines. Various studies have shown the effect on OPD traffic due to bounce of prescriptions at the pharmacy. The pharmacists have a major role to play in prevention of prescription bounces by regularly updating the hospital drug formulary and keeping the stocks in check.

RESEARCH QUESTION

- What are the probable reasons leading to bounce of prescriptions in OPD Pharmacy
- What is the average loss of revenue due to bounce of prescriptions in OPD Pharmacy

OBJECTIVES

The objectives of the study are:

- To understand the patient process flow of the OPD Pharmacy
- To observe the prescription shortages/unavailability of drugs at the OPD Pharmacy
- To identify the reasons for shortages/unavailability of medicines
- To suggest the measures to minimize the prescribed medicine shortfalls in the department
- To obtain patient feedback on medicines availability & dispensing at OPD pharmacy

RATIONALE

- As a part of the induction programme operations and functioning of certain departments of the hospital was observed based on which a small presentation summarizing the understanding was prepared which gave direction to the study that will be conducted.
- Maintaining the standards and continuous improvement in the quality of the care provided to the patient is what Manipal Hospital seeks for. In order to maintain the desired standards the hospital has always taken the necessary steps that can further improve the efficiency.

  The suggested study aimed at observing the count of prescription bounces at the OPD pharmacy and identifying the reasons for the same so that corrective

measures can be suggested to minimize the unavailability of drugs at the OPD pharmacy.

METHODOLOGY

- STUDY DESIGN: The study conducted was a Cross-Sectional and Observational study.

- STUDY SETTING: OPD Pharmacy of the Hospital
- DURATION OF THE STUDY: 4 weeks
- STUDY PARTICIPANTS: STUDY PARTICIPANTS: The participants of the study will be:
  - Assistant Manager- Supply Chain - 1
  - Pharmacists - 3
  - Patient Care Services / Front Office staff
  - Patients

REVIEW OF LITERARURE

The recommending of pharmaceuticals is a basic piece of the arrangement of wellbeing and speaks to a generally protected, powerful, and cheap method of treatment. All the clinics spend around 30-40% of their aggregate wellbeing spending plan on drugs, a significant number of which are recommended unreasonably.

For a successful use of the assets spent on drugs, it is basic that the endorsing and organization of medications be assessed every once in a while, to evaluate the mistake in such methods, and search for conceivable arrangements.

Mistakes can be amid medicine, organization, translation, or apportioning of the medication. In connection to endorsing, blunders of exclusion and mistakes of commission have been depicted. Remedy ricochet is one of the different elements prompting loss of income from the healing facility drug store. Significantly every one of the patients going to the OPD drug store are from OPD interviews which are dependably in a hurry and if the prescriptions are not accessible at the counter, leaves a repulsive impact on the patient and subsequently isn't useful for the healing facility by and large.

As per a July 2011 American Hospital Association overview, 99.4% percent of 820 healing centers studied had encountered no less than one medication deficiency in the previous a half year. About half experienced at least 21 deficiencies in this period.1 If the past pattern remains constant, the issue is deteriorating. Makers willfully announced 56 medicate deficiencies to the Food and Drug Administration (FDA) for the whole year in 2006.2 According to the FDA, that number expanded to 61 every month in November 2011,3 a 13 crease increment more than 5 years. Also, intentional announcing programs regularly under-speak to the genuine number of occurrences. A few clinics have at least 100

progressing drug deficiencies at any one time. In light of FDA data,2 an unbalanced offer of medications in deficiency were regarded basic medications, for example, narcotics/soporifics, succinylcholine, naloxone, furosemide, and crisis syringes.

Pharmaceutical production network is not quite the same as the other supply chains since its client (specialist) is unique in relation to shopper. This reality shows that for any pharmaceutical item to be effective there are two critical issues - first is to produce medicine and second is make item accessible at retailer. Loss of offers due to non-accessibility of items at the retailer's end is very normal in current pharmaceutical appropriation setup. Diligent non-accessibility of items can have an antagonistic effect on their request, since the specialists may quit recommending in situations where accessibility is an issue. This problem has set the need for Research to discover profitable determinations that could help out enhance the present situation. This article gives points of interest of a think about which was performed utilizing a procedure comprising of organized meetings, did with numerous members in the pharmaceutical inventory network, including specialists, therapeutic agent, scientific experts and stockiest.

As indicated by the report distributed by Ernst and Young on - "Opening the capability of pharmaceutical appropriation framework". In this investigation post CFA dissemination framework is engaged to discover requirements and models for understanding those limitations. As indicated by the creator JaberidoostM, Nikfar S, Abdollahiasl A, Dinarvand R. Pharmaceutical organizations, a noteworthy player of the medicate production network, are liable to numerous dangers. These dangers upset the supply of pharmaceutical from numerous points of view, for example, their amount and quality and their conveyance to one side place and clients and at the correct time. In this manner chance distinguishing proof in the supply procedure of pharmaceutical organizations and alleviate them is very suggested. It was demonstrated that the larger part of dangers in pharmaceutical production network were interior dangers due to procedures, individuals and capacities fumble which could be overseen by reasonable moderation methodologies.

The drug store calling is experiencing a change in outlook from item situated to tolerant arranged practice. This patient-situated practice is named as pharmaceutical care. All through the world, the main undertaking of drug store is thought to be the pharmaceutical care. Pharmaceutical care implies the dependable arrangement of medication treatment for accomplishing unmistakable results that enhance the nature of patient's life. Enhanced helpful results incorporate more prominent patient security, better medication treatment and sickness administration, significant social insurance consumption, best adherence, and enhanced personal satisfaction.

Pharmaceutical care rehearse includes a covenantal connection between the drug specialist and the patient in which tranquilize utilize is controlled by the drug specialist alongside duty and comprehension of the patient's advantage. It is seen as drug store calling's development by tolerating the social obligation to decrease preventable medication related dismalness and mortality. Pharmaceutical care

rehearse includes the intermittent unrest in human services administrations gave by drug specialists. A few investigations directed in the created nations have announced that pharmaceutical care hone has an extensive beneficial outcome on human services cost and administration and drug specialists have worked a great deal for usage of pharmaceutical care hone. Also, it is viewed as that drug specialists can assume an incredible part in the central medicinal services arrangement, especially in monetarily creating nations. Be that as it may, in creating nations, usage of pharmaceutical care still experiences various obstacles, among which are time limitations, nonattendance of perceived repayment framework, inaccessibility of suitable space, less access to persistent medicine record, deficient number of capable drug specialists, and lack of standard practice methodology. As a creative practice, a large portion of the experts feel hesitant to its execution. A few drug specialists differ to the perception that the execution of pharmaceutical care administrations has practiced potential beneficial outcomes on the helpful results, while different drug specialists are of the conclusion that drug store future depends upon the arrangement of other social insurance benefits additionally instead of simply apportioning. For fruitful execution of pharmaceutical care, the drug specialist's logic of training holds indispensable significance. Additionally, drug specialists need to adjust their insight, disposition, and aptitudes to this new practice, which incorporates conventional learning of pharmaceutical science with clinical parts of patient care, specifically administration abilities, capacity to effectively speak with medicinal groups, and fitness to determine sedate related issues.

Solution treatment is basic in treating and anticipating malady what's more, is an essential piece of regular day to day existence for some parts of the world. The pharmaceutical inventory network of producers, wholesalers, drug specialists, and in addition doctors and governments, recognize the significance of having a consistent supply of drugs. Be that as it may, it is conceivable inside the present medication appropriation framework for glitches to happen, for example, here and now delay purchases or long haul sedate inaccessibility. The test for human services suppliers is to give consistent, proportionate medication treatment at equivalent expenses. Appraisal requires a basic assessment of the present circumstance what's more, potential effect of the lack on quiet results.
When an imperative medication item isn't accessible, experts will need to know:

- purposes behind the item's inaccessibility
- when the item will be accessible
- alternatives for acquiring the medication from substitute sources
- substitute treatments and their cost outcomes
- related data needs of human services suppliers and patients.

For development of solutions' utilization and patients' personal satisfaction, wellbeing experts in India are expected to execute pharmaceutical care hone in the human services arrangement of the nation. There is a lack of drug specialists in private and in addition open medicinal services areas however for as long as

couple of years their number has been expanding to an adequate degree. Notwithstanding their inclusion in coordinate patient care, healing facility drug specialists are more engaged with managerial exercises.

Every one of the prescriptions accessible at the healing facility Pharmacy are chosen in light of the Drug model as exhorted by the PTC (Pharmaco-Therapeutic Committee). At its most essential level, a model is a rundown of solutions. Generally, a model contained an accumulation of recipes for the aggravating and testing of pharmaceutical (an asset nearer to what might be alluded to as a pharmacopeia today). Today, the fundamental capacity of a medicine model is to indicate specific prescriptions that are endorsed to be recommended at a specific doctor's facility, in a specific wellbeing framework, or under a specific health care coverage approach. The improvement of medicine models depends on assessments of viability, security, and cost-adequacy of medications.

Contingent upon the individual model, it might likewise contain extra clinical data, for example, symptoms, contraindications, and measurements.

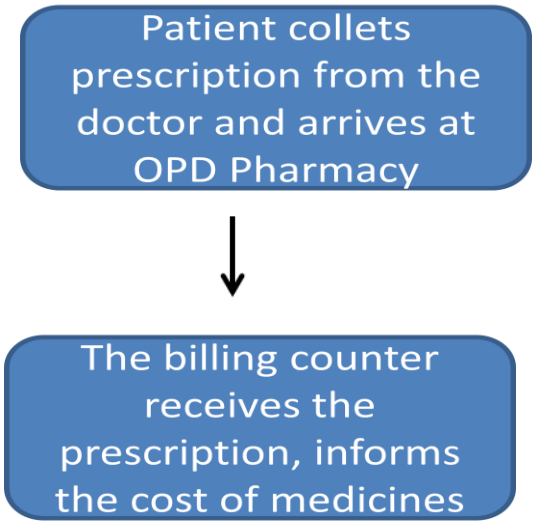
SAMPLING AND SAMPLING SIZE

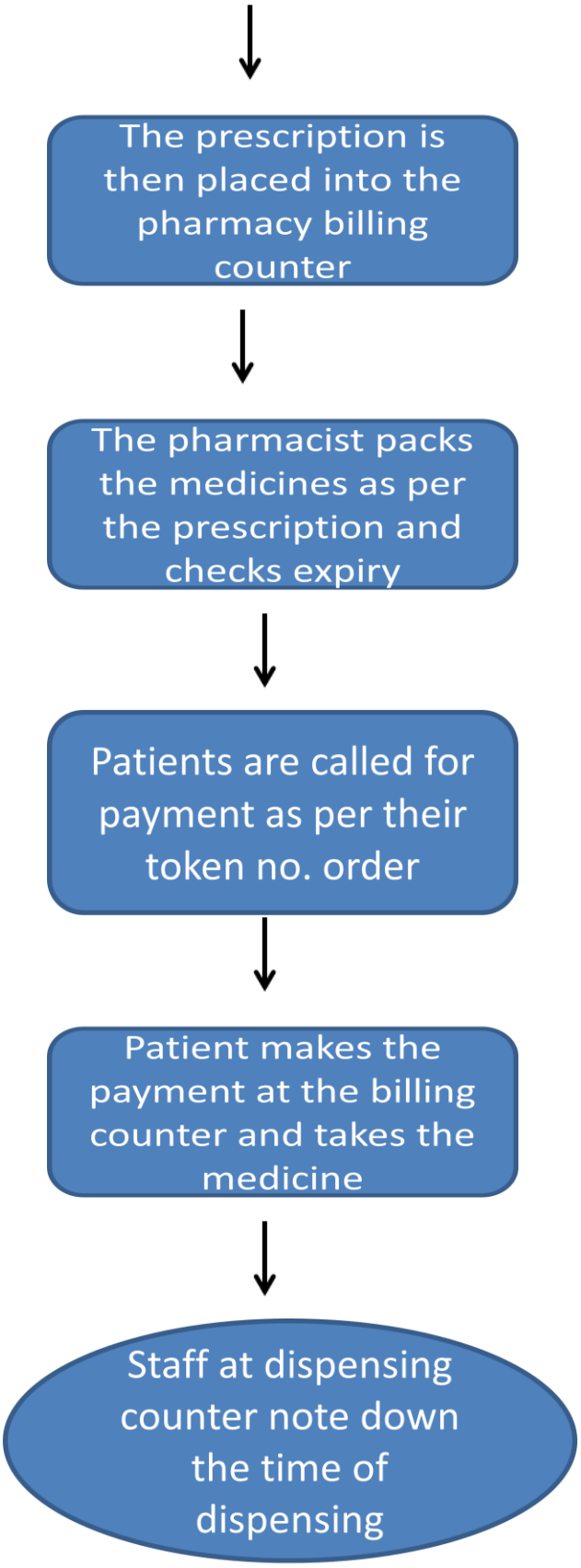
Exclusion and Inclusion Criteria:

Only those patients visiting the OPD pharmacy will be considered to be the part of the study.

- The study was conducted for 4 weeks where:
- Observation time: 2 weeks
- Data collection time : 2 weeks
- The data was collected in the peak OPD traffic duration that is 10 am to 3 pm
- Each day of the data collection duration, the data was collected for 30-35 patients

PATIENT FLOW AT THE OPD PHARMACY




The prescription is then placed into the pharmacy billing counter
The pharmacist packs the medicines as per the prescription and checks expiry
Patients are called for payment as per their token no. order
Patient makes the payment at the billing counter and takes the medicine
Staff at dispensing counter note down the time of dispensing

DATA COLLECTION

PRIMARY DATA

- Direct Observation
- Discussion with Pharmacy staff
- Taking pictures of the prescriptions brought b the patient

SECONDARY DATA

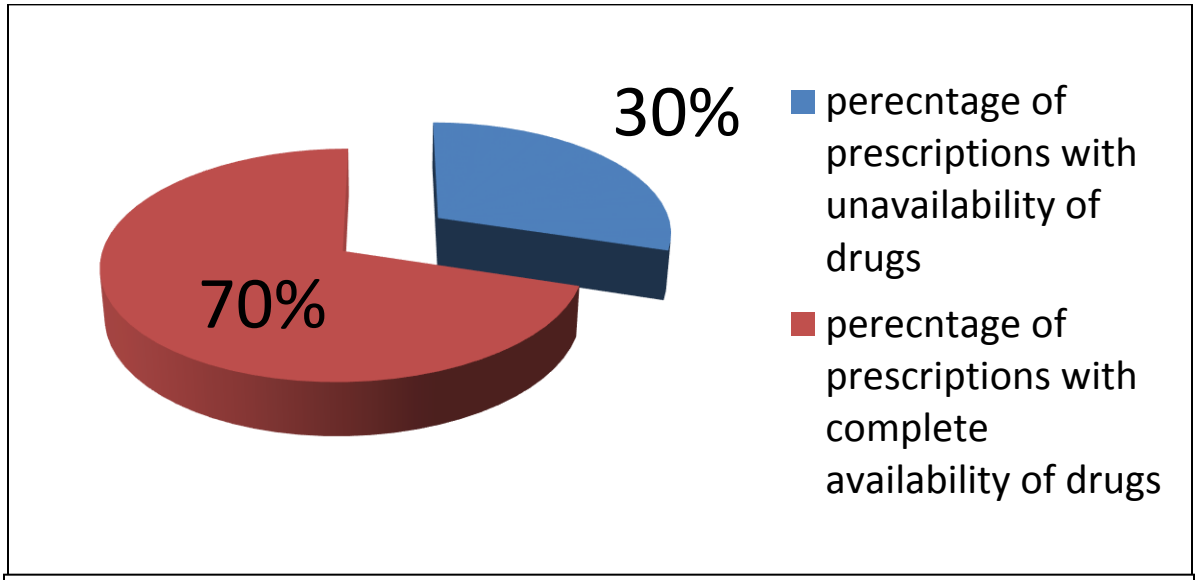
- As all the patient data is entered in the HMIS and the bills provided to them were given in the printed format, The HMIS is hence used to take the secondary data and to tally the final amount of bills

DATA COLLECTION TOOLS

- Direct observation for understanding the routine activities of the department and flow of the patients and information however no checklist will be prepared for the same and it will be totally a personal observation
- Pictures of the prescriptions brought by the patients were referred to understand the no. of items demanded and also if the medicine is new or a listed medicine in the hospital formulary
- HMIS, to collect the issued bills of the patients whose data has been recorded so that the total billed amount can be recorded

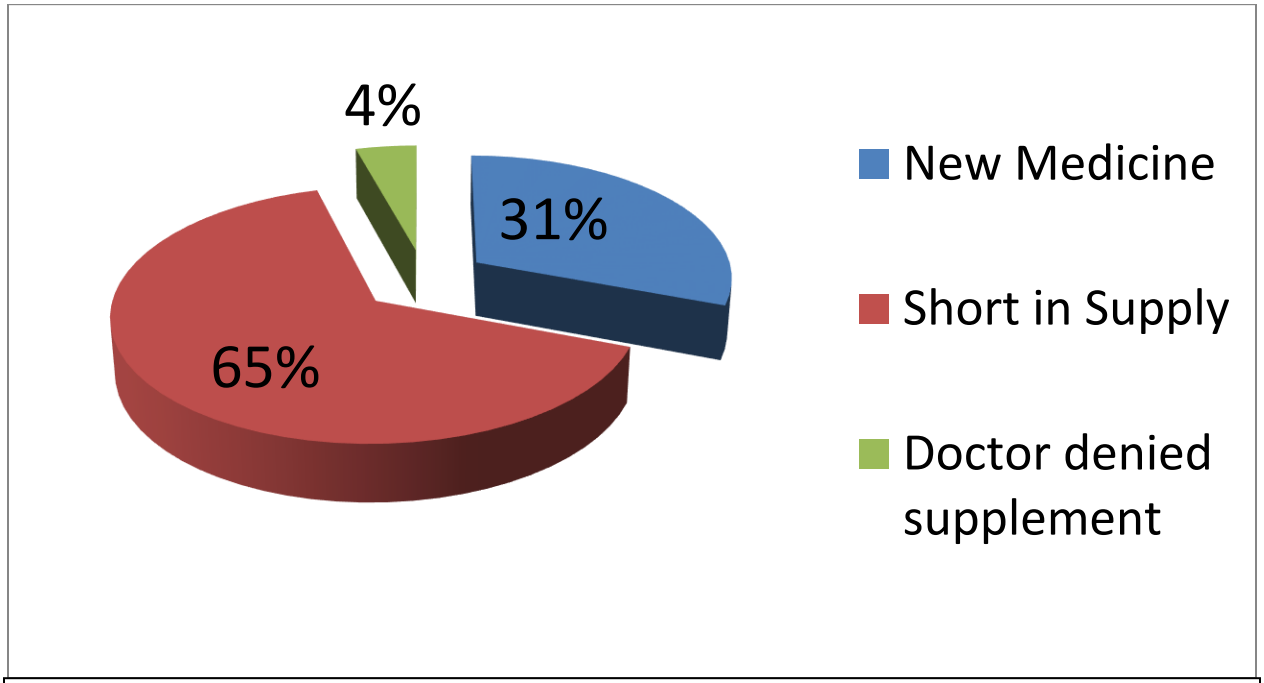
DATA ANALYSIS

- Data was collected in a Microsoft excel sheet, keeping a track of no. of items demanded, number of items issued and total of billed amount
- The price and amount of missing drugs was then verified from the list of drugs at the hospital formulary and further from the hospital store
- For documentation and dissemination of the data charts and graphs are used for the better understanding and clarity



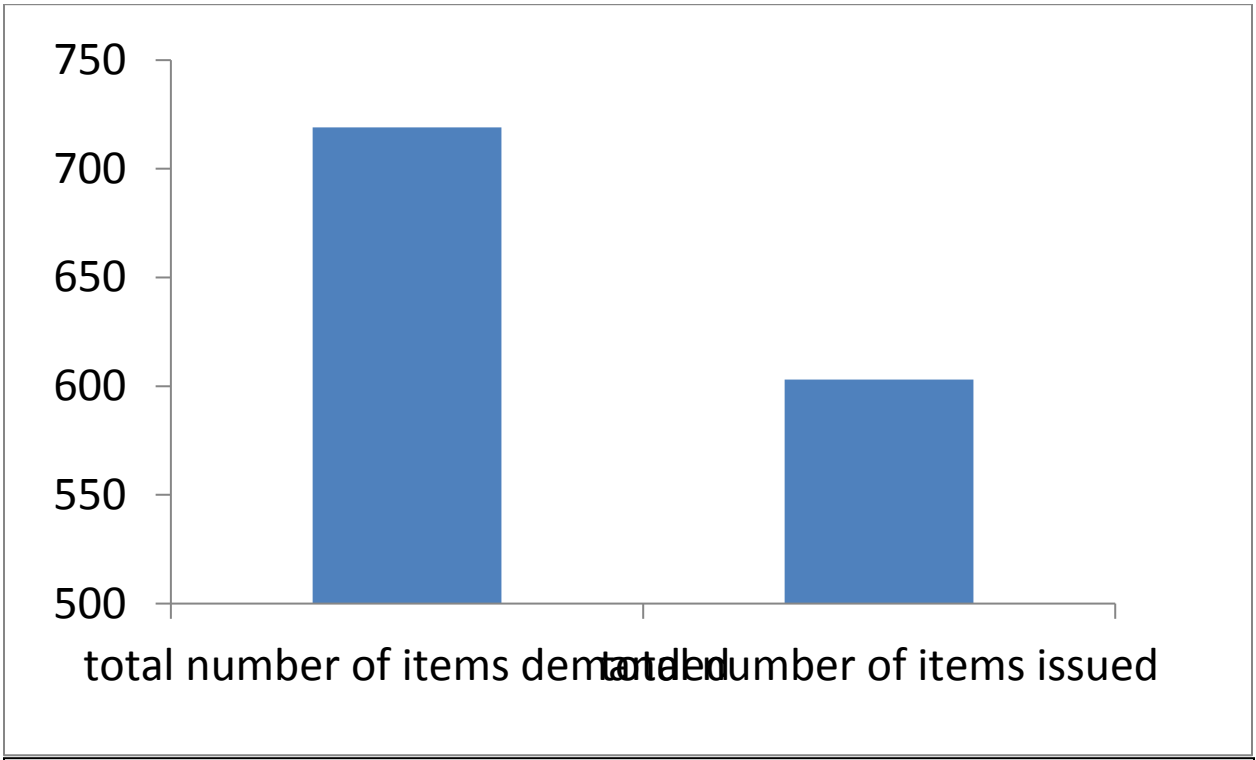
The above Pie- Chart shows the percentage availability of medicines at the OP Pharmacy. Out of the 550 Study sample, 165 account for the bounced prescriptions i.e. 30 %

Figure 1



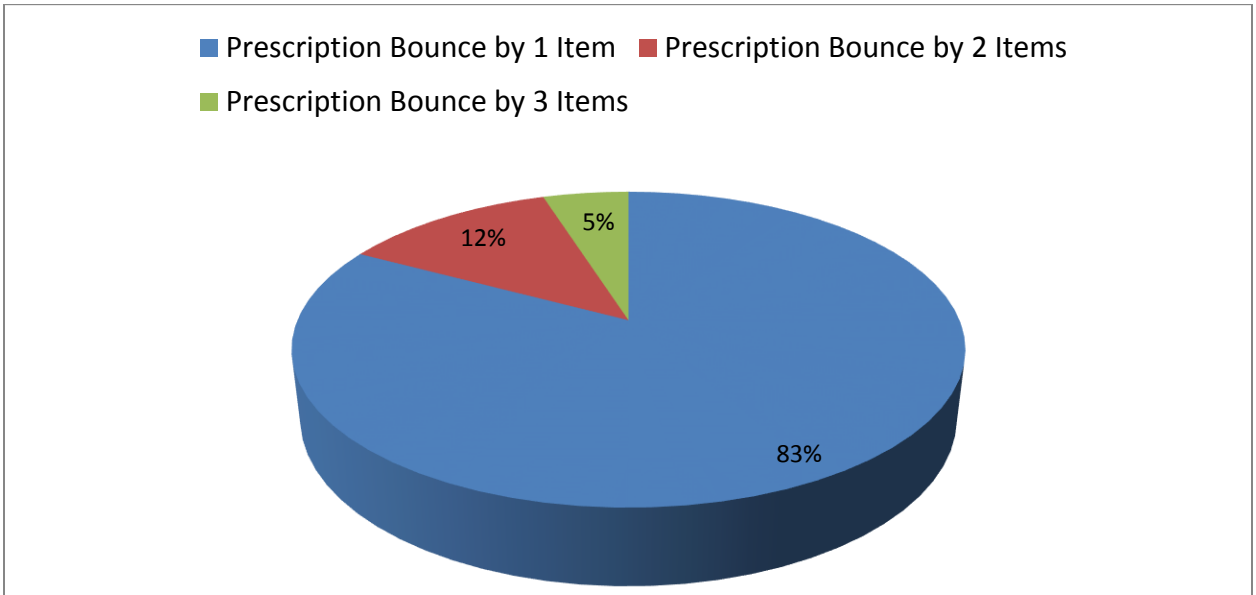
The above Pie- Chart shows the reasons for unavailability of different medicines in percentage. Majorly 3 reasons that were identified during the study were : Shortage in supply, New medicine (not in the drug formulary), Doctors deny supplement.

Figure 2



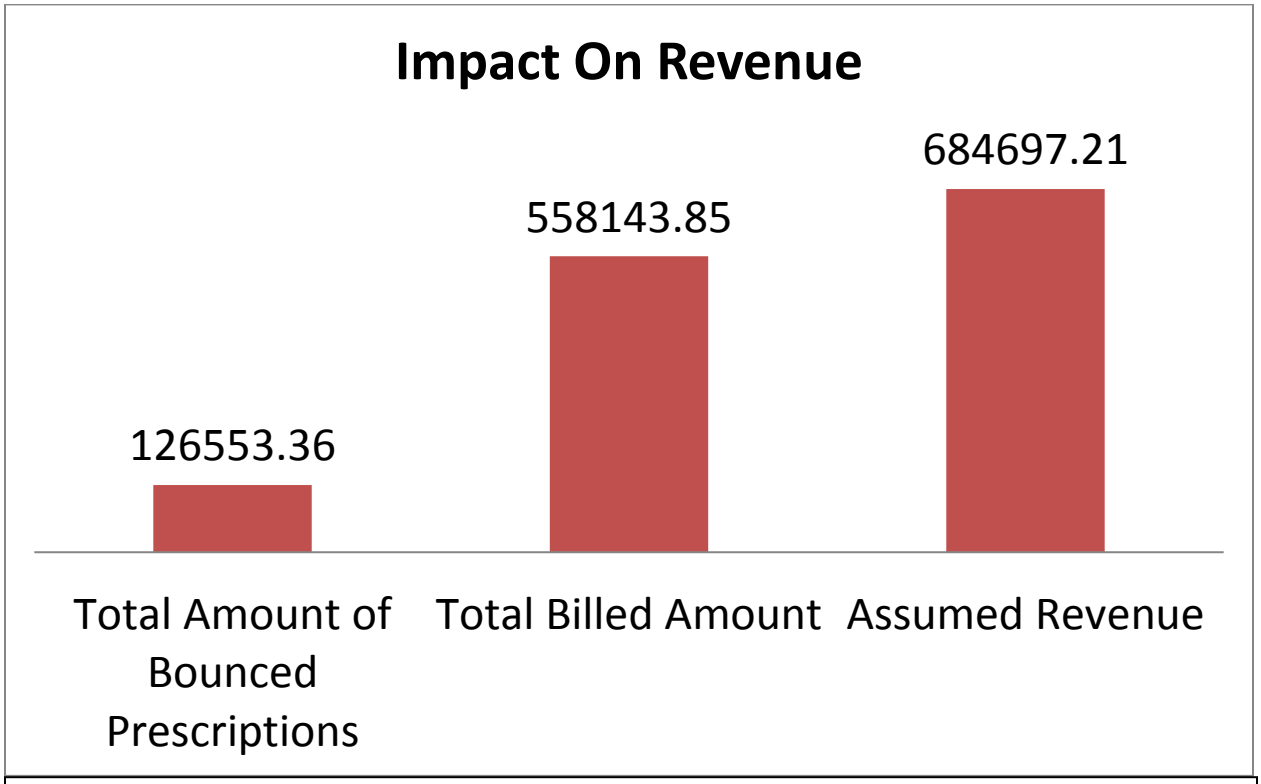
The above bar graph shows the demand and supply of no. of items at the OP Pharmacy during the study period.

Figure 3



The above Pie- Chart shows the percentage un-availability of medicines/items at the OP Pharmacy by 1/2/3 in number.

Figure 4



The above bar graph shows the impact on revenue due to bounce of prescriptions at the OP Pharmacy during the study period.

Figure 5

LIMITATION OF THE STUDY

- Time limitation as per the training hours and days (9am – 5:30pm, No data was collected for Sundays)
- For a day only one out of the three dispensing counters will be taken up for the study.
- No data will be recorded for OTC patients as well as for CGHS and ECHS patients.

FINDINGS

1. Patients with ESIC/CGHS referral tend to not take medicine from the OPD pharmacy as they prefer not to pay
2. Many a times medicines are short in quantity
3. Patients many a times complain that a particular medicine is not available at OP Pharmacy while it is available at IP Pharmacy

4. Many new drugs are not available in the OP Pharmacy as their demand is never generated before
5. If a particular medicine is not available, patients refuse to take any medicine at all in the prescription
6. Doctors sometimes do not approve of the substitutes
7. Medicines are available in double or half the dosage mentioned in the prescription for which not all patients agree
8. Whenever there is a medicine prescribed which is new for the pharmacy stock list, the staff there, either gives a substitute for the same with doctor's permission or asks the patient to come later
9. They maintain a register to keep a track of all the bounce and new medicines separately
10. Certain medicines which are not available in the OP pharmacy are made available from the IP pharmacy following an IP indent
11. The staff in the OP pharmacy works in 3 shifts: Morning, Evening and Night shifts
12. The medicines given are well explained about the dosage and the time to consume to all the patients

RECOMMENDATIONS

1. As per the results obtained, due to the 18% bounce of prescriptions the revenue being lost was either due to the patients not reaching the pharmacy for purchase or prescriptions not been dispensed due to non-availability of drugs prescribed.
2. In order to address such issues and improving the productivity of the pharmacy the following possible solutions could be adopted:
3. The drug formulary should be regularly updated as per the discussions with the consultants and also by taking notes with the new doctors joining the hospital.
4. The Pharmacy in charge can play a key role in this by regularly meeting the consultants and asking them to write the salt name of the drug being prescribed.
5. Keeping the pharmacy stock outs in check by probably using a checklist
6. Timeliness of service delivery.
7. The management can help in between by convincing the doctors to allow the pharmacists to dispense substitutes of the drugs prescribed to the patients
8. Certain insurance companies provide insurance for medical drugs for a certain amount. The hospital can have a tie-up with such insurance companies and this would also help the patients who find medicines unaffordable.
9. The PTC should provide a list to the new joining doctors to prescribe the medicines from the list as having too many substitutes of the same drug would be cumbersome for the pharmacy
10. The inventory should be checked at the time of delivery and all the medicines whose shelf life is less than 3 months should be sent back to the vendor.

CONCLUSION

During the entire period of the study it was observed that in a sample size of 550 about 28% bounce of prescription is causing a loss of revenue over 1,20,000 INR and also a lot of inconvenience for the patients.

Outpatient drug store, in any doctor's facility assumes a vital part in tolerant care and it makes accessible the recommended pharmaceuticals calm of solace for the patients and without budgetary weight, hence encouraging viable patient results and in addition meeting their fulfillment. The division requests compelling stock control and quality administration to help the clinic incomes. All things considered, survey investigations of working of healing facility drug store would enormously add to improvement of its quality and profitability.

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PROJECT 2 – PLANNING A DIABETIC FOOT CARE CLINIC AT MANIPAL HOSPITAL, JAIPUR

INTRODUCTION

Diabetic foot disease is one of the most common, serious, feared and costly complications of Diabetes. Patients with diabetes are at a 15 to 40 fold higher risk of a lower limb amputation than a Non-diabetic patient.
80% of lower limb amputations in diabetes are preceded by the development of a foot ulcer and it is estimated that the annual incidence of lower limb ulceration in patients with diabetes varies between 2.2% to 7.0%. Diabetic foot disease is costly, with patients frequently requiring admission to hospital, investigations, surgery and a prolonged hospital stay.

BACKGROUND AND RATIONALE

- As part of the hospital induction programme, operations and functioning of different parts of the hospital were observed. Based on which it was found out that there are two Endocrinologists working in the hospital.
- The hospital is already providing diagnostic services for diabetes and surgical services for foot amputation.
- Based on the existing OPD of the Endocrinologist, it was suggested by the Administration to plan a Diabetic foot care clinic in the hospital to provide services to vulnerable patients with a history of chronic diabetes.
- As the environmental scanning it was done and it was found out that there are no other Diabetic Foot Care services being provided in the radius of 5 Km from the hospital.
- In private or public sector there are various private practitioners providing preventive care for developing DFUs in highly diabetic patients or the ones prone to develop the disease at the primary level. There is no Intermediate or Center for excellence that can provide services from regional catchment area with possible referrals from outside as well as international referrals.

AIM OF THE STUDY

1. To prepare a Diabetic Foot Care clinic plan for the hospital that can provide preventive as well as curative services for Diabetic Foot Ulcers.

2. Alongside the services provided at the intermediate center, the hospital aims at getting national, regional and International referrals

` **OBJECTIVES**

- To develop a plan for Diabetic Foot Care Clinic in Manipal Hospital, Jaipur
- To give implementable recommendations for the same

REVIEW OF LITERATURE

WHY DOES A HOSPITAL NEED A DIABETIC FOOT CARE CLINIC?

Because patient demands have increased dramatically over the years.

Nearly 62 million Indians suffer from diabetes. A survey of type 2 diabetics in Puducherry, published in 2014 in the *Indian Journal Of Endocrinology,* found that only 54% of the respondents were aware that diabetes could lead to reduced foot sensation and foot ulcers, and only 22% of diabetic patients had their feet examined regularly by a health worker or doctor.
If blood sugar remains high for years and diabetes is not treated effectively, it can damage the feet in two ways, says Sanjay Kala, national secretary, Indian Podiatry Association, and head of surgery at the GSVM Medical College in Kanpur.

1. The high glucose level in the blood weakens nerves.

2. It creates vascular problems. Circulation and blood supply to the feet is diminished. This is because high glucose levels tend to clog the arteries of the feet in the same way that it affects the heart arteries.

As a result of poor circulation and nerve damage, diabetics often experience a complete loss of sensation in their feet, developing a condition called neuropathy. Diabetic neuropathy occurs gradually over a period of 8-10 years after one is first diagnosed as a diabetic. That's why an early diagnosis (of diabetes) is important. And an adequate foot-care routine must follow.

METHODOLOGY

- **TYPE OF STUDY:** Prospective Descriptive study
- **STUDY SETTING:** Manipal Hospital, Vidyadhar Nagar, Jaipur
- **DURATION OF THE STUDY:** 12 Weeks (February 5th 2018 – May 5th 2018)
- **DATA COLLECTION PROCEDURE:** From the hospital information system.

- **DATA ANALYSIS PROCEDURE:** Data Analysis was done with the help of MS Excel.
- **DATA COLLECTION INSTRUMENT:** Retrospective Data from Hospital Information System about the existing Endocrinology OPD

NEED ASSESSMENT

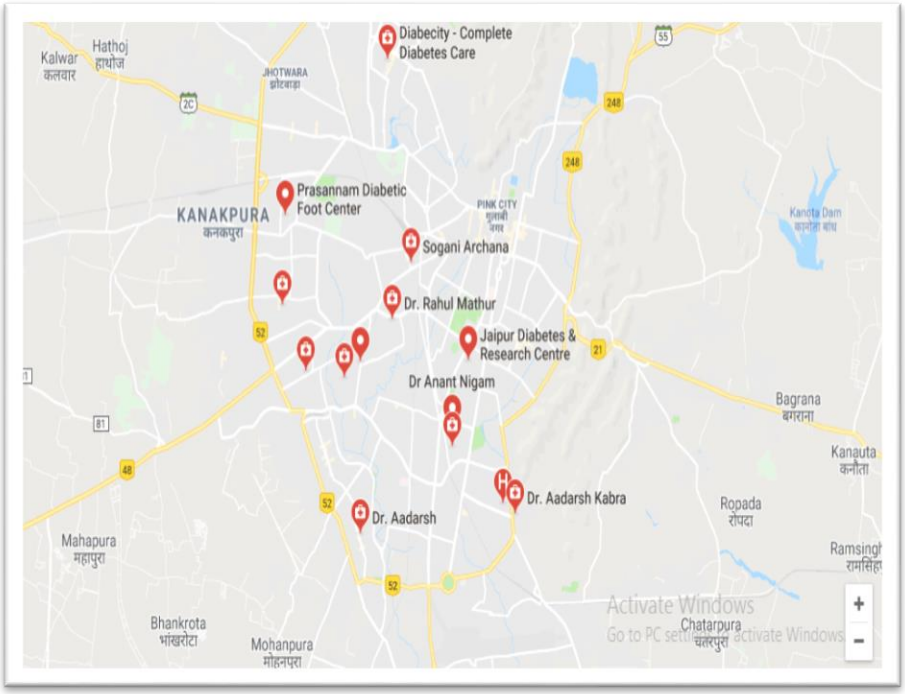
By taking the retrospective data of Endocrinologist for past 6 months, We found out that the OPD of the department is about 180 per year of which 40 percent of the patients are highly diabetic.

Therefore are at a risk of developing Diabetic Foot Ulcer in future.

So, As suggested by the Endocrinologist and decided by the Hospital Management team, A Diabetic Foot Care Clinic with Day care facility was to be developed.

After the Environmental Research around the Hospital, it was found out, that there is no other Facility which is providing the service in a range of about 5 km in the hospital vicinity.

S.NO.	JAIPUR	Distance	NCR	INDIA
1	Prasannam Diabetic Foot Centre	7 Km	Dr. Bedi's Vascular Clinic (New Delhi)	DFC Diabetic Foot Clinic (Mumbai)
2	Dr. Archana Sogani	12 Km	Dr. Atul Luthra (Gurgaon)	Save Legs Diabetic Foot Clinic & Wound Care Centre (Hyderabad)
3	Dhand Diabetes care	22 Km	Varicose Vein Specialist (New Delhi)	Diabetik Foot Centre India Pvt. Ltd. (Chennai)
4	Diabecity Complete Diabetes care	6 Km	Dr. Naveen (Delhi)	Diabetic Foot Care Clinic (Mumbai)
5	DC hospital	10 Km	Dr. Neelam Kukreti (Gurgaon)	Swasthya Diabetes Care (Ahemdabad)
6	Dr. Anant Nigam	14 Km	Dr. S. Bhatacharya-Centre for diabetes & Hormones (Noida)	Diabetic Foot Care & Wound Care Clinic (New Delhi)


Diabecity - Complete Diabetes Care
Hathoj
हाथोज
Kalwar
कलवार
JHOTWARA
झोटवाड़ा
Prasannam Diabetic Foot Center
KANAKPURA
कनकपुरा
PINK CITY
गुलाबी नगर
Kanota Dam
कानोता बांध
Sogani Archana
Dr. Rahul Mathur
Jaipur Diabetes & Research Centre
Dr Anant Nigam
Bagrana
बगराना
Kanauta
कनौता
Dr. Aadarsh Kabra
Dr. Aadarsh
Ropada
रोपदा
Mahapura
महापुरा
Ramsingh
रामसिंह
Bhankrota
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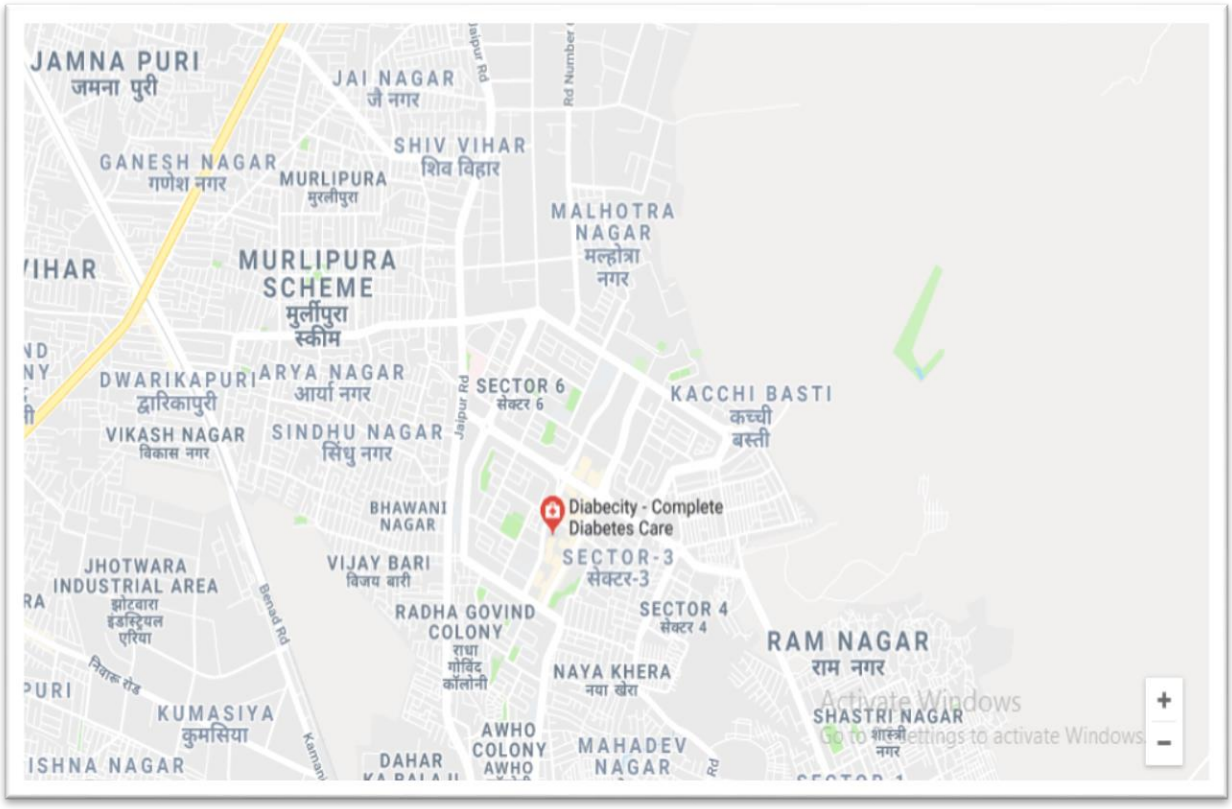
JAMNA PURI
जमना पुरी
JAI NAGAR
जै नगर
SHIV VIHAR
शिव विहार
GANESH NAGAR
गणेश नगर
MURLIPURA
मुरलीपुरा
MALHOTRA NAGAR
मल्होत्रा नगर
MURLIPURA SCHEME
मुर्लीपुरा स्कीम
DWARIKAPURI
द्वारिकापुरी
ARYA NAGAR
आर्या नगर
SECTOR 6
सेक्टर 6
KACCHI BASTI
कच्ची बस्ती
VIKASH NAGAR
विकास नगर
SINDHU NAGAR
सिंधु नगर
BHAWANI NAGAR
Diabecity - Complete Diabetes Care
SECTOR-3
सेक्टर-3
JHOTWARA INDUSTRIAL AREA
झोटवारा इंडस्ट्रियल एरिया
VIJAY BARI
विजय बारी
RADHA GOVIND COLONY
राधा गोविंद कॉलोनी
SECTOR 4
सेक्टर 4
RAM NAGAR
राम नगर
NAYA KHERA
नया खेरा
KUMASIYA
कुमसिया
AWHO COLONY
MAHADEV NAGAR
SHASTRI NAGAR
शास्त्री नगर
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CAPITAL EXPENDITURE

Equipment	Equipment Cost/Procedure Cost	Test Cost
Angiography	Already taking place in the hospital	Rs. 5500/-
Angioplasty	Already taking place in the hospital	Rs. 12000
Arterial Bypass	Already taking place in the hospital	Rs. 45000
Doppler Scan	Already taking place in the hospital	Rs. 7260/-
CT scans	Already taking place in the hospital	Rs. 8580/-
Ultrasound	Already taking place in the hospital	Rs. 1320/- (abdomen)
Pedobarometer	6,50,000	1000/-
Patient chair	Approx. Rs. 2,00,000/-	
Biothesiometer	Approx. Rs. 25,000/-	
10g Monofilaments	Rs.20/ piece (min. order 100 piece)	
PODIATRIST INSTRUMENTS • Surgical Curettes • Chisels, Osteotomes, rasps • Cuticle and tissue nipper • Nail nippers and splitters • Metatarsal Elevators • Retractors • Forceps and Clamps • Scissors and	Approx. Rs. 10,000/- (Advance Podiatric Kit)	

Knives • Rongeurs		

- Office Cost:
  - Patient Couch : 18,000
  - Podiatary Chair : 2,00,000 approx
  - Desktop/Laptop : 40,000
  - Printer : 7-10,000
- Equipment Cost :
  - Pedometer : 6,50,000
  - Vascular Age : 12,00,000
  - Vibrotherm : 1,25,000

In order to find out the break even point for the above mentioned equipments, ROI was calculated for the 3 Equipments :

Vascular Age						
YEAR	**0**	**1**	**2**	**3**	**4**	**5**
Qty	INR 0	220	275	344	430	537
Price/ rate	INR 0	INR 1,400	INR 1,800	INR 2,300	INR 2,900	INR 3,600
Increased Revenue	INR 0	INR 308,000	INR 495,000	INR 790,625	INR 1,246,094	INR 1,933,594

Qty						
Price/ rate						
Decreased Cost	INR 0	INR 0	INR 0	INR 0	INR 0	INR 0

Initial assessment costs	INR 1,000,000	INR 0	INR 0	INR 0	INR 0	INR 0
Legal costs	INR 0					
Registration costs	INR 0					
Administration costs						
Other one-time overhead expenses (provide break-up separately)						
Total one-time costs	INR 1,000,0	INR 0	INR 0	INR 0	INR 0	INR 0

	00					
Consumption		INR 30,800	INR 49,500	INR 79,063	INR 124,609	INR 193,359
Labour expenses/Prof Fee		INR 61,600	INR 99,000	INR 158,125	INR 249,219	INR 386,719
Repairs Maintenance		INR 0	INR 2,475	INR 3,953	INR 6,230	INR 9,668
Insurance		INR 616	INR 990	INR 1,581	INR 2,492	INR 3,867
Electricity		INR 1,540	INR 2,475	INR 3,953	INR 6,230	INR 9,668
AMC		INR 0	INR 39,600	INR 63,250	INR 99,688	INR 154,688
Other costs (specify with break-up separately)			INR 2,475	INR 3,953	INR 6,230	INR 9,668
Recurring costs	INR 0	INR 94,556	INR 196,515	INR 313,878	INR 494,699	INR 767,637
Net Earnings Per Year		INR 213,444	INR 298,485	INR 476,747	INR 751,395	INR 1,165,957

Pedometer						
YEAR	**0**	**1**	**2**	**3**	**4**	**5**
Qty	INR 0	220	286	372	483	628
Price/ rate	INR 0	INR 1,000	INR 1,300	INR 1,600	INR 2,000	INR 2,500
Increased Revenue	INR 0	INR 220,000	INR 371,800	INR 594,880	INR 966,680	INR 1,570,855

Qty						
Price/ rate						
Decreased Cost	INR 0	INR 0	INR 0	INR 0	INR 0	INR 0

Iinitial assessment costs	INR 6,50,000	INR 0	INR 0	INR 0	INR 0	INR 0
Legal costs	INR 0					
Registration costs	INR 0					
Administration costs						
Other one-time overhead expenses (provide break-up						

separately)						
Total one-time costs	INR 0	INR 0	INR 0	INR 0	INR 0	INR 0

Consumption		INR 22,000	INR 37,180	INR 59,488	INR 96,668	INR 157,086
Labour expenses/Prof Fee		INR 44,000	INR 74,360	INR 118,976	INR 193,336	INR 314,171
Repairs Maintenance		INR 0	INR 18,590	INR 29,744	INR 48,334	INR 78,543
Insurance		INR 440	INR 744	INR 1,190	INR 1,933	INR 3,142
Electricity		INR 1,100	INR 1,859	INR 2,974	INR 4,833	INR 7,854
AMC		INR 0	INR 29,744	INR 47,590	INR 77,334	INR 125,668
Other costs (specify with break-up separately)		INR 1,100	INR 1,859	INR 2,974	INR 4,833	INR 7,854
Recurring costs	INR 0	INR 68,640	INR 164,336	INR 262,937	INR 427,273	INR 694,318
Net Earnings Per Year		INR 151,360	INR 207,464	INR 331,943	INR 539,407	INR 876,537

VIBROTHERM

YEAR	**0**	**1**	**2**	**3**	**4**	**5**
Qty	INR 0	220	286	372	483	628
Price/ rate	INR 0	INR 500	INR 600	INR 800	INR 1,000	INR 1,300
Increased Revenue	INR 0	INR 110,000	INR 171,600	INR 297,440	INR 483,340	INR 816,845

Qty						
Price/ rate						
Decreased Cost	INR 0	INR 0	INR 0	INR 0	INR 0	INR 0
Initial assessment costs	INR 125,000	INR 0	INR 0	INR 0	INR 0	INR 0
Legal costs	INR 0					
Registration costs	INR 0					
Administration costs						
Other one-time overhead expenses (provide break-up separately)						
Total one-time costs	INR 125,000	INR 0	INR 0	INR 0	INR 0	INR 0

Consumption		INR 11,000	INR 17,160	INR 29,744	INR 48,334	INR 81,684
Labour expenses/Prof Fee		INR 22,000	INR 34,320	INR 59,488	INR 96,668	INR 163,369
Repairs Maintenance		INR 0	INR 858	INR 1,487	INR 2,417	INR 4,084
Insurance		INR 220	INR 343	INR 595	INR 967	INR 1,634
Electricity		INR 550	INR 858	INR 1,487	INR 2,417	INR 4,084
AMC		INR 0	INR 13,728	INR 23,795	INR 38,667	INR 65,348
Other costs (specify with break-up separately)		INR 550	INR 858	INR 1,487	INR 2,417	INR 4,084
Recurring costs	INR 0	INR 34,320	INR 68,125	INR 118,084	INR 191,886	INR 324,287
Net Earnings Per Year		INR 75,680	INR 103,475	INR 179,356	INR 291,454	INR 492,557

- Cost of land cannot be included in the capital expenditure as the hospital already has sufficient accommodative space

OPERATION EXPENDITURE/ REQUIREMENT

As discussed with the Diabetologist, following manpower appointment scheme would be appointed:

Specialist	Number of people	Salary Proposition
Diabetologist/ Endocrinologist	2	INR 1,50,000-2,50,000/month
Nurse – 1	1	INR 15000
Technical Assistant – 2	2	INR 10-15000/month
Vascular Surgeon	1	INR 4,50,000/month
Plastic Surgeon	1	INR 2,50,000/month
Orthopaedic	1	INR

Consultant		4,50,000/month

Later Certain other specialists might be needed to add:

- Patient Counsellor
- Prosthetist – Visiting Consultant
- Diabetic Footwear provider - Outsourced

SERVICES PROVIDED

- Stenting
- Fore foot amputation
- Flap Rotator- post Surgery
- Above Knee Amputation
- Arthrodesis – Major/Minor/Medium
- Skin Grafting – Major/Minor/Medium
- Mid Foot Amputation
- Change Of Dressing

NEW SERVICES THAT NEED TO BE ADDED FOR DAY CARE AND PREVENTIVE CARE

- Corn Shaving
- Callus Shaving
- Ray amputation
- Wound debridement

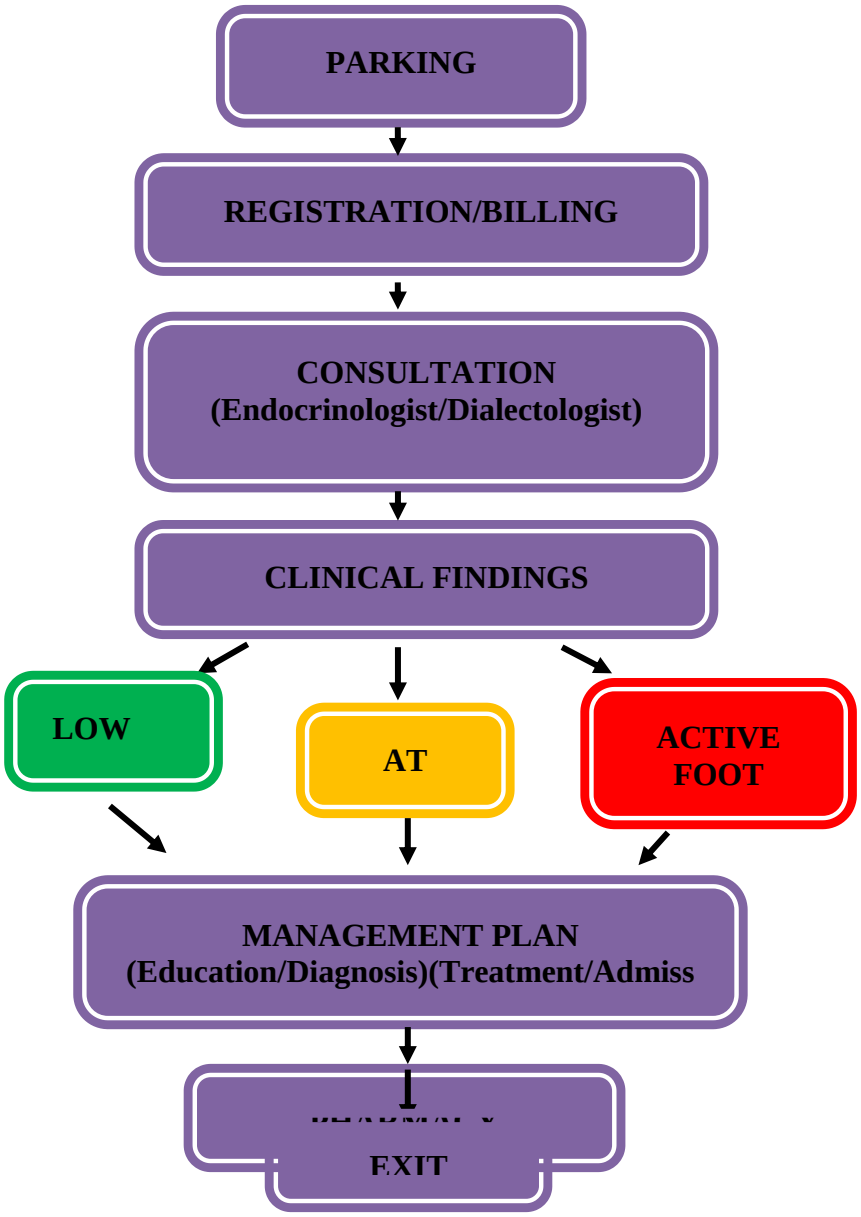
SERVICE PACKAGES :

- Package – Certain packages are working in the hospital like:

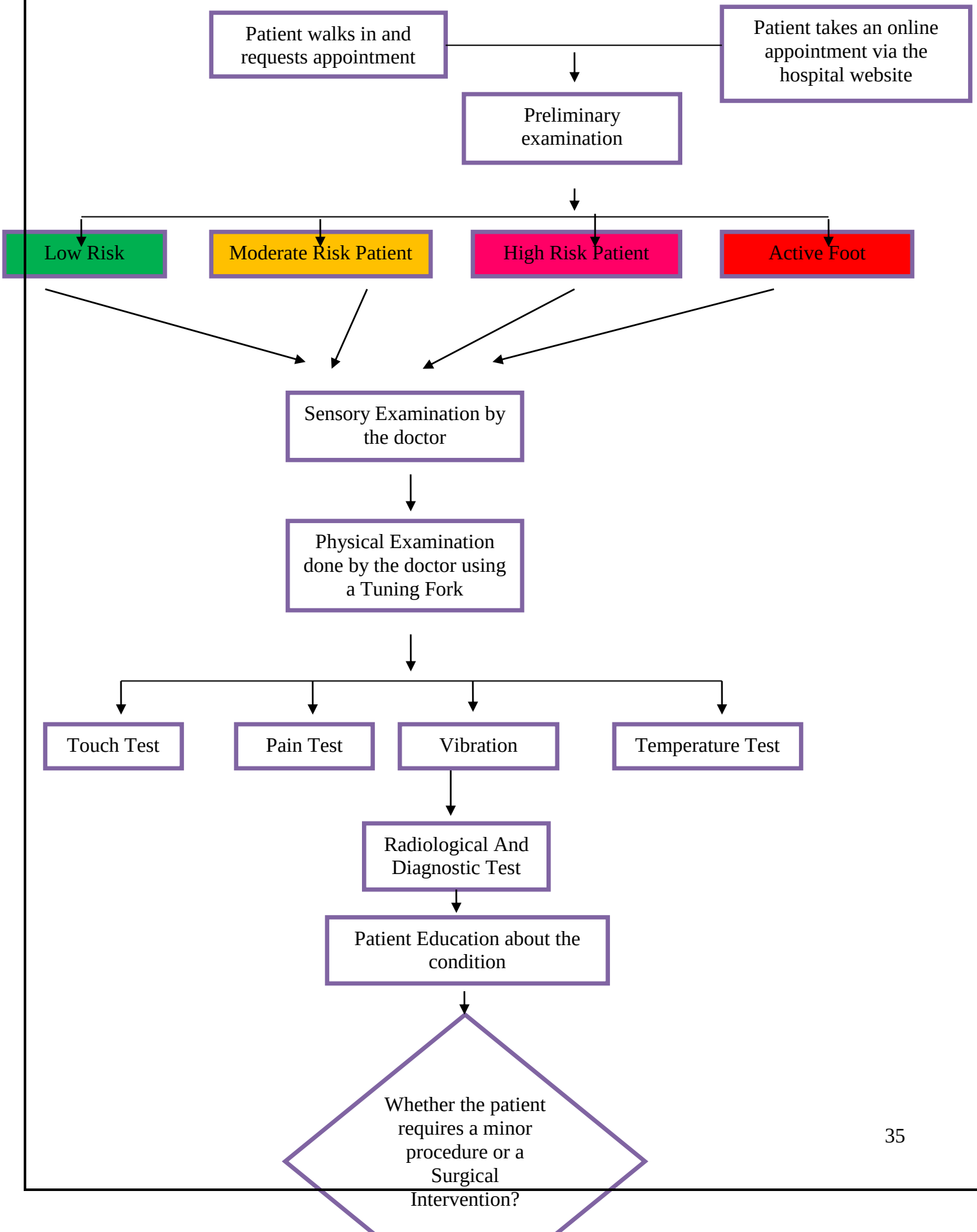
- Comprehensive Diabetes Package - 999
- Diabetes Health Checkup - 2560
- Diabetes Package - 599
- Diabetes Health Package - 1680
- Diabetes Package For Anniversary Special - 1110

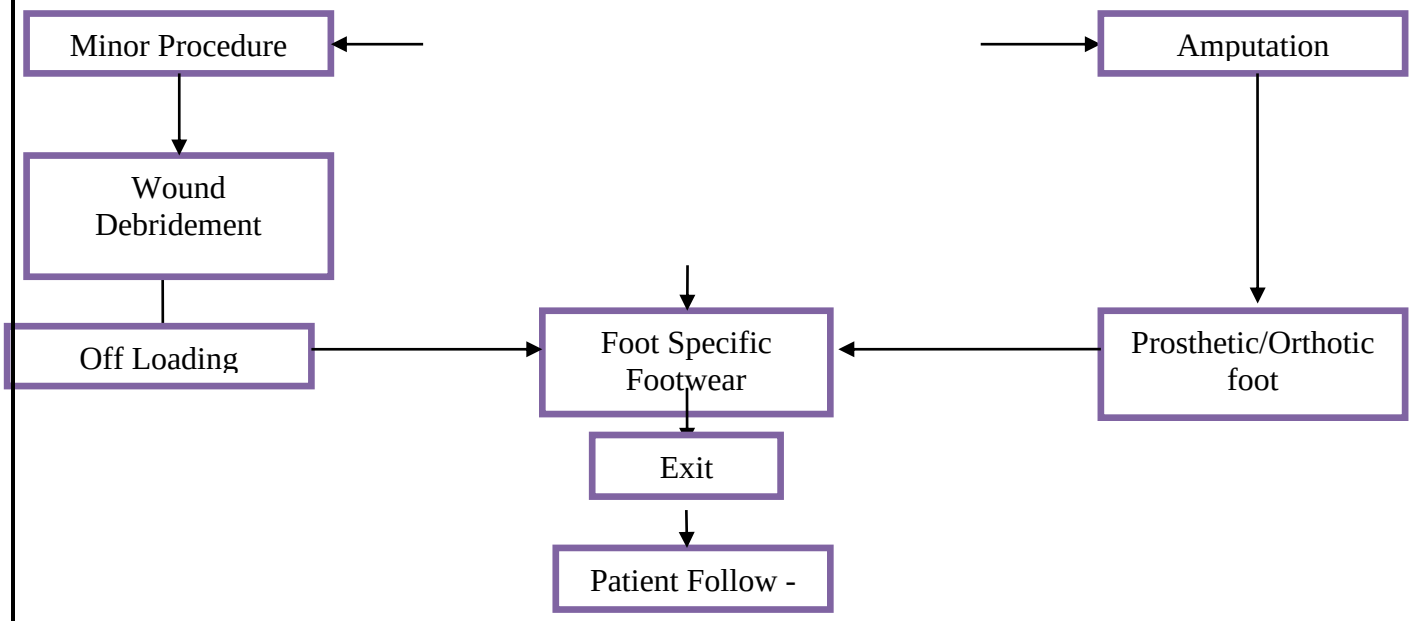
- Diabetes Foot Clinic Package - 599
- Well Diabetes Package – 600
- Preventive care packages could be like: (Discussed with Diabetologist)
- Vibrotherm + Vascular Age - 1500-2000
- Vibrotherm + Vascular Age + pedometer - 2500
- Vascular age – 1000 – 1200
- Pedometer – 800 -1000

PATHWAY FOR PEOPLE WITH DIABETIC FOOT PROBLEMS



FLOW OF PATIENTS IN THE CLINIC





RECOMMENDATIONS AND IMPLEMENTATIONS

- The endocrinologists along with the marketing team are training junior resident doctors and nurses about the basic care procedures for highly diabetic cases
- A new Diabetologist has been appointed dedicated to give Diabetic Foot Care Clinic services
- One of the 3 major equipments have been lined up to be purchased in this quarter
- The finance team has come with many new plans to facilitate the delivery of care and convenience to patients
- Certain prosthetists can be called on visitation basis to provide prosthetic foot or consultations for the same
- The equipments like Vibrotherm once installed in the hospital premises, can be kept open for other hospitals or nearby health facilities to provide diagnostic tests

CONCLUSION

Considering the enormous burden due to diabetes in India, it is important to realize the cost-effective measures of diabetes care like early screening, tight metabolic control, monitoring of risk factors and assessing of organ damage. The prospective study conducted to plan the Diabetic Foot Care Clinic at the hospital has lead to certain implementations which will further progress the work to functional fulfillment of the clinic. The new Diabetologist hired will further add

value to the services already being provided in regard to the disease. It is important to keep the cost of treatment feasible for the patient as when this is not available or its quality is poor, the overall direct and indirect costs escalate with disastrous health and economic consequences to the individual, his family and society particularly due to the onset of the micro and macro vascular complications of diabetes.

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