

**INTERDEPARTMENTAL REFERRAL CONVERSIONS: A TREND AND
VARIANCE ANALYSIS IN DIAGNOSTIC AND PHARMACY SERVICES IN A
TERTIARY CARE HOSPITAL**

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for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

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by

Ipsita Panigrahi

Under the Supervision and Guidance of

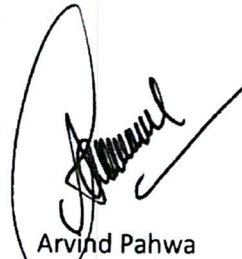
Dr. Mamta Chauhan

2025

CERTIFICATE

This is to certify that **Ms. Ipsita Panigrahi** in partial fulfillment of the requirements for the award of the degree of MBA Hospital and Health Management from the IIMMR University, Jaipur has successfully completed her internship at Max Super Speciality Hospital, Shalimar Bagh during Mar 10 - May 31, 2025.

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OF
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CERTIFICATE

This is to certify that dissertation titled “**Interdepartmental Referral Conversions: A Trend and Variance Analysis in Diagnostic and Pharmacy Services in a Tertiary Care Hospital**” is a record of the research work undertaken by **Ms. Ipsita Panigrahi** in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his *her* approach to the research study has been sincere, scientific, and analytical.

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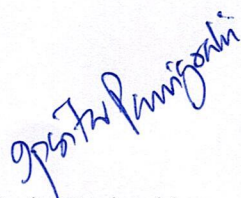
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Dr. Sanjay Gupta
School Dean
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Date- 18/06/2025

DECLARATION BY STUDENT

I hereby declare that this dissertation titled **“Interdepartmental Referral Conversions: A Trend and Variance Analysis in Diagnostic and Pharmacy Services in a Tertiary Care Hospital”** is the Bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



Ms. Ipsita Panigrahi

Date: 18/06/2025

ABSTRACT:

This study investigates referral conversion trends and departmental variances across three critical service areas—Laboratory, Radiology, and Pharmacy—within Max Super Speciality Hospital, Shalimar Bagh, a premier tertiary care facility in North-West Delhi. In high-functioning hospital ecosystems, interdepartmental referrals (commonly termed as “drop-downs”) serve as the backbone of integrated patient care. When effectively managed, these referrals ensure timely diagnostics, therapeutic interventions, and medication dispensation, thereby directly influencing both clinical outcomes and operational efficiency.

Despite the strategic importance of referral conversions, hospitals often encounter inefficiencies due to poor tracking systems, inconsistent service uptake, and lack of coordination among departments. To address this gap, the present dissertation undertook a detailed empirical analysis aimed at understanding monthly referral conversion ratios, departmental responsiveness, and areas of systemic lag. The study’s key objective was to assess the extent of conversion efficiency and identify operational disparities that may affect care continuity.

A retrospective observational design was adopted using anonymized, secondary data from the hospital’s integrated HIS platform (DRISHTI). The study analysed OPD-generated referrals over a three-month period from January to March 2025. A total enumeration sampling technique was used to include all eligible consultation records—spanning more than 2,000 entries from 27 departments. Variables assessed included number of referrals advised, actual conversions, monthly conversion percentages, and inter-month variances.

Data processing and analysis were conducted using Microsoft Excel. Descriptive statistics were employed to summarize referral volumes, while line and bar graphs were utilized to visualize monthly trends and highlight performance discrepancies. The analysis revealed distinct patterns across the three service departments. Laboratory services exhibited a steady improvement in referral conversion rates, likely influenced by streamlined follow-up protocols in departments such as Cardiology and Diabetes. In contrast, Radiology displayed inconsistent performance with higher month-to-month fluctuation, indicating possible bottlenecks in imaging appointment allocation or patient compliance. Pharmacy, while registering high initial referral volumes, showed significant conversion drops in several

departments—implying potential gaps in patient counselling, availability of medications, or insurance-linked processes.

The study's findings underscore the urgent need for structured referral tracking systems, real-time performance dashboards, and interdepartmental SOP harmonization. By establishing clear accountability frameworks and using technology to automate follow-up mechanisms, hospitals can significantly reduce referral leakages and enhance overall service delivery.

In conclusion, the dissertation presents evidence that referral conversion analysis is not merely a measure of departmental output but a vital indicator of systemic coherence and operational maturity. This work offers practical insights for healthcare administrators aiming to optimize diagnostic and pharmacy coordination, ultimately contributing to improved patient experience and institutional efficiency.

Keywords: Referral Conversion, Interdepartmental Referrals, Laboratory, Radiology, Pharmacy, Variance Analysis

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Sincerely,

Ipsita Panigrahi

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CHAPTER 1: INTRODUCTION

In today's hospital systems, the coordination of care among various departments is essential to ensure that patient services are timely, complete, and efficient. One of the core mechanisms enabling this coordination is the use of interdepartmental referrals—commonly termed as “drop-downs” within Hospital Information Systems (HIS). These referrals originate from the Outpatient Department (OPD) and guide the patient toward diagnostic services (Laboratory and Radiology) or therapeutic services (Pharmacy) based on the clinical judgment of consulting physicians.

In tertiary care hospitals, where patient volume is high and clinical pathways are complex, such referrals serve not only as a means of directing care but also as a reflection of departmental synergy. However, in the absence of proper tracking and follow-up mechanisms, a substantial number of these referrals remain unconverted, meaning the patient does not avail of the service recommended. This leads to service delays, diagnostic backlogs, patient dissatisfaction, resource wastage, and financial underperformance for the institution.

1.1 Background of the Study

Max Super Speciality Hospital, Shalimar Bagh, located in North-West Delhi, operates under the Max Healthcare network and is accredited by both NABH (for hospital quality standards) and NABL (for laboratory services). The hospital caters to a wide patient base through 35+ specialties and is equipped with comprehensive support departments such as Laboratory, Radiology, and Pharmacy. The integration between these departments, especially in the OPD context, provides an opportunity to assess operational efficiency through referral conversion trends.

While patient management systems are digitized and capable of generating detailed reports, a data-driven approach to analyzing referral effectiveness is not yet standardized across departments. Understanding the conversion of referrals—whether they were acted upon and completed—can serve as a critical quality metric for internal audits and performance improvement.

1.2 Problem Statement

Despite the availability of robust Hospital Information Systems (HIS), many hospitals do not analyze referral data to assess departmental coordination. Drop-down referrals are recorded, but the extent to which they are converted into actual lab investigations, radiological imaging, or medicine dispensing is often unclear. This lack of visibility results in missed opportunities for service optimization, revenue generation, and patient satisfaction.

At Max Super Speciality Hospital, Shalimar Bagh—a NABH and NABL accredited tertiary care hospital with over 35 specialties—OPD-generated referrals are frequent. However, there is no standardized audit mechanism to track how many of these referrals result in service utilization. This study addresses that gap by analyzing referral conversion trends and variance across Laboratory, Radiology, and Pharmacy departments.

1.3 Purpose of the Study

The primary purpose of this study is to assess the performance of interdepartmental referrals by analyzing how many of them result in successful conversions—i.e., the patient availing the suggested service. By studying trends over time and across departments, the study seeks to:

- Identify patterns of high or low conversion
- Pinpoint operational bottlenecks
- Recommend actionable improvements for coordination and follow-up

1.4 Importance of the Study

By focusing on referral conversions, the study introduces a quantitative framework to assess departmental performance beyond routine indicators. It offers a new perspective for hospital quality teams and operations managers to track conversion ratios, identify performance trends, and implement targeted improvements. Moreover, the findings can support the development of referral dashboards, enhance SOP compliance, and facilitate better follow-up with patients—thereby contributing to clinical excellence and hospital efficiency.

1.5 Research Question:

How effective and consistent are interdepartmental referral conversions from OPD to Laboratory, Radiology, and Pharmacy services in ensuring service utilization within a tertiary care hospital

1.6 Objectives:

1. To measure the number of OPD-generated referrals (drop-downs) to the Laboratory, Radiology, and Pharmacy departments.
2. To determine the monthly conversion rate of these referrals across a three-month period.
3. To analyse the variance in conversion trends and identify patterns of inefficiency.
4. To compare interdepartmental performance in terms of conversion efficiency and responsiveness.
5. To recommend system-level interventions that can enhance tracking and improve patient follow-through.

1.7 Hypothesis:

H0 (Null Hypothesis): There is no significant difference in the average number of referrals and conversions among Laboratory, Radiology, and Pharmacy departments.

H1 (Alternative Hypothesis): There is a significant difference in the average number of referrals and conversions among Laboratory, Radiology, and Pharmacy departments

1.8 Significance of Study

In conclusion, this chapter sets the foundation for a multi-departmental analysis aimed at improving the linkage between patient consultation and downstream services. The study is grounded in the belief that systematic evaluation of referral pathways can help hospitals not only achieve clinical efficiency but also enhance the patient experience through better service integration.

CHAPTER 2: REVIEW OF LITERATURE

A comprehensive literature review was undertaken to explore the dynamics of referral conversion in tertiary care hospitals, with a focus on interdepartmental coordination among Laboratory, Radiology, and Pharmacy services. Existing research provides insight into how digital systems, operational workflows, and patient behaviour influence referral success. This chapter presents both global and Indian studies that have shaped the framework of this research.

Author(s) & Year	Study Location	Sample Size	Sampling Technique	Salient Features (What They Found)
Nakayuki et al. (2021)	LMICs (Systematic Review)	38 studies	Literature Review	Identified lack of referral tracking, poor SOPs, and communication as major challenges in health referral systems.
Zuckerman et al. (2013)	United States	2,692 patients	Cross-sectional survey	Found major barriers to specialty referral completion included lack of communication and follow-up.
Desalegn et al. (2013)	Ethiopia	250 physicians	Cross-sectional study	Showed that lab test referral inaccuracy was due to unclear protocols and lack of physician training.
Pradhan et al. (2021)	India	Conceptual	Qualitative policy review	Discussed how AI-enabled referrals and telehealth can reduce service fragmentation in diagnostics and pharmacy.
Jayadeepa et al. (2021)	Tripura, India	500+ scans	Retrospective observational	Teleradiology improved radiology service accessibility and reporting timelines in remote hospitals.

Table 2.1: Summary of Reviewed Literature

These studies collectively demonstrate that:

- Digitalization of referral systems significantly enhances conversion rates.
- Operational bottlenecks and incomplete documentation often result in service leakage.
- Variance across departments is frequently due to inconsistent follow-up mechanisms and lack of coordination.
- HIS-based solutions with KPI tracking can bridge referral gaps and improve departmental accountability.

The current study builds upon these foundations by applying their principles in a real-world, tertiary care setting—Max Super Speciality Hospital, Shalimar Bagh. By analyzing actual HIS data over a three-month period, the study provides quantitative validation to many of the insights mentioned in the literature.

CHAPTER 3: METHODOLOGY

This chapter outlines the methodological framework adopted to conduct the study on referral conversion trends across Laboratory, Radiology, and Pharmacy services in a tertiary care hospital. It details the research design, study setting, population, tools, data sources, and ethical safeguards used to ensure reliability and compliance.

3.1 Research Design

To quantify the number of OPD consultations and corresponding referrals (dropdowns) to Laboratory, Radiology, and Pharmacy.

To calculate the monthly referral conversion rate for each department.

To identify interdepartmental variance in conversions and track monthly performance fluctuations.

To identify departments with consistently high or low average referrals to Laboratory, Radiology, and Pharmacy services.

3.2 Research Design

This research adopts a retrospective observational design using secondary data. It involves the analysis of pre-recorded hospital data to assess referral conversions without manipulating any variables. The observational nature of the study helps in understanding real-world referral and utilization trends without introducing researcher bias.

The study focused on OPD-generated interdepartmental referrals made between January and March 2025. By using historical Hospital Information System (HIS) data, it allows for a robust analysis of actual hospital processes over time, aiding in operational assessment and decision-making.

3.3 Study Setting

The study was carried out at Max Super Speciality Hospital, Shalimar Bagh, located in North-West Delhi. This hospital is part of the Max Healthcare group and is NABH and NABL accredited, ensuring high standards in both clinical and laboratory services. The hospital has an advanced HIS (DRISHTI) which allows for accurate data extraction across

departments. The integration of OPD services with diagnostic and therapeutic departments made it an ideal setting to study interdepartmental coordination and efficiency.

3.4 Study Population

3.4.1 Inclusion Criteria:

- All OPD patients during the study period (Jan–Mar 2025)
- Patients with recorded interdepartmental referrals (Laboratory, Radiology, Pharmacy)
- Only those referrals with available follow-up conversion status (converted/not converted)
- Patient categories: Cash, Corporate, TPA, and International

3.4.2 Exclusion Criteria:

- Patients with incomplete or missing referral or conversion data
- Public Service Unit (PSU) and Economically Weaker Section (EWS) patients due to inconsistent documentation

3.4.3 Sampling Technique

A Total Enumeration Sampling method was used, in which every eligible patient referral from the hospital's OPD database during the defined study period was included. This approach avoided selection bias and allowed for full-spectrum analysis across all departments without any need for randomization.

3.4.4 Study Tools

The study relied on the following tools:

- DRISHTI HIS Reports: Used for extracting monthly consultation, referral, and conversion data
- Microsoft Excel: Used for cleaning, organizing, and analyzing data; preparing bar charts and calculating variances

These tools ensured consistency in data handling and permitted real-time visualization of departmental trends.

3.4.5 Data Collection Procedure

Monthly data was extracted for each department (Lab, Radiology, and Pharmacy) covering:

- Total OPD consultations per specialty
- Number of “drop-down” referrals generated
- Number of services actually availed (conversions)

The data was compiled month-wise (January, February, March 2025) and department-wise (across 27 departments) to facilitate comparative and trend analysis.

3.5 Operational Definitions

- **Drop Down Advised:** A formal referral from the OPD to a support service such as Laboratory, Radiology, or Pharmacy.
- **Conversion:** A case in which the patient availed the referred service within a reasonable time frame (same or next visit).
- **Conversion Rate:**
$$\text{Conversion Rate} = \frac{\text{Converted Referrals}}{\text{Drop Down Referrals}} \times 100$$

$$\text{Conversion Rate} = \frac{\text{Converted Referrals}}{\text{Drop Down Referrals}} \times 100$$
- **Variance:** The change or difference in monthly conversion rates used to identify inconsistencies or improvements.

3.6 Data Analysis Plan (Using Microsoft Excel)

Data was analyzed using descriptive statistics such as frequency counts, averages, and percentage distributions. Graphical tools in Excel were used to illustrate month-to-month trends and department-wise variances.

Two primary metrics were calculated:

- **Conversion Rate:** Indicates departmental efficiency in executing referred services.
- **Monthly Variance:** Captures the change in conversion rates between two consecutive months to identify service consistency or lag.

Graphs and summary tables were generated to facilitate visualization and interpretation.

3.7 Ethical Considerations

This study involved no direct patient interaction. All data was secondary and extracted from the hospital's HIS in a completely anonymized and encrypted format. Institutional permission was obtained prior to data access. The research adhered to ethical norms related to confidentiality, data security, and informed consent waivers for retrospective analysis.

CHAPTER 4: RESULTS

This chapter presents the monthly referral conversion data across Laboratory, Radiology, and Pharmacy departments for January to March 2025. The aim is to analyze the trend in service conversions and highlight any fluctuations or consistency across departments. The charts and tables below summarize the findings.

4.1 Sample Overview

The study was conducted across multiple clinical departments at Max Super Speciality Hospital, Shalimar Bagh. The dataset comprised monthly averages of three operational indicators:

1. Outpatient consultations
2. Drop-downs advised for lab tests
3. Actual lab conversions

The sample includes departmental data for January, February, and March 2025. A total of 25 departments were observed, with recorded data sourced from the hospital's Health Information System (HIS). The goal was to assess interdepartmental efficiency in converting clinical referrals (drop-downs) to actual diagnostic service utilization (lab conversions).

4.2 Data Analysis Approach

- **Data Source:** Hospital HIS records for Jan–Mar 2025
- **Variables:** Monthly consultation count, drop-down advised count, and lab conversion count
- **Analysis Tools:** Microsoft Excel
- **Classification:** Each department was color-classified based on numeric ranges (e.g., 0–5, 6–15 conversions, etc.) for clear visualization
- **Averages:** Mean values across the three months were calculated for each indicator per department

All results are presented with appropriate tables and figures, and key patterns are highlighted.

Results Presentation

4.3OPD Consultations Overview

Department	Average Consultations
Cardiac Surgery	25
Cardiology	450
Dental	25
Dermatology	250
Diabetes	150
ENT	150
General Surgery	250
Internal Medicine	550
Medical Gastro	550
Medical Oncology	150
Medical Paediatrics	150
Mental Health	150
Nephrology	250
Neuro Surgery	150
Neurology	450
Obs & Gynae	550
Ophtal	75
Orthopaedics	550
Others	250
Plastic Surgery	25
Pulmonology	550
Radiotherapy	25
Surgical Oncology	25
Surgical Paediatrics	75
Urology	350
Vascular Surgery	75

Table 4.1: OPD Departments Classified by Average Monthly Consultations

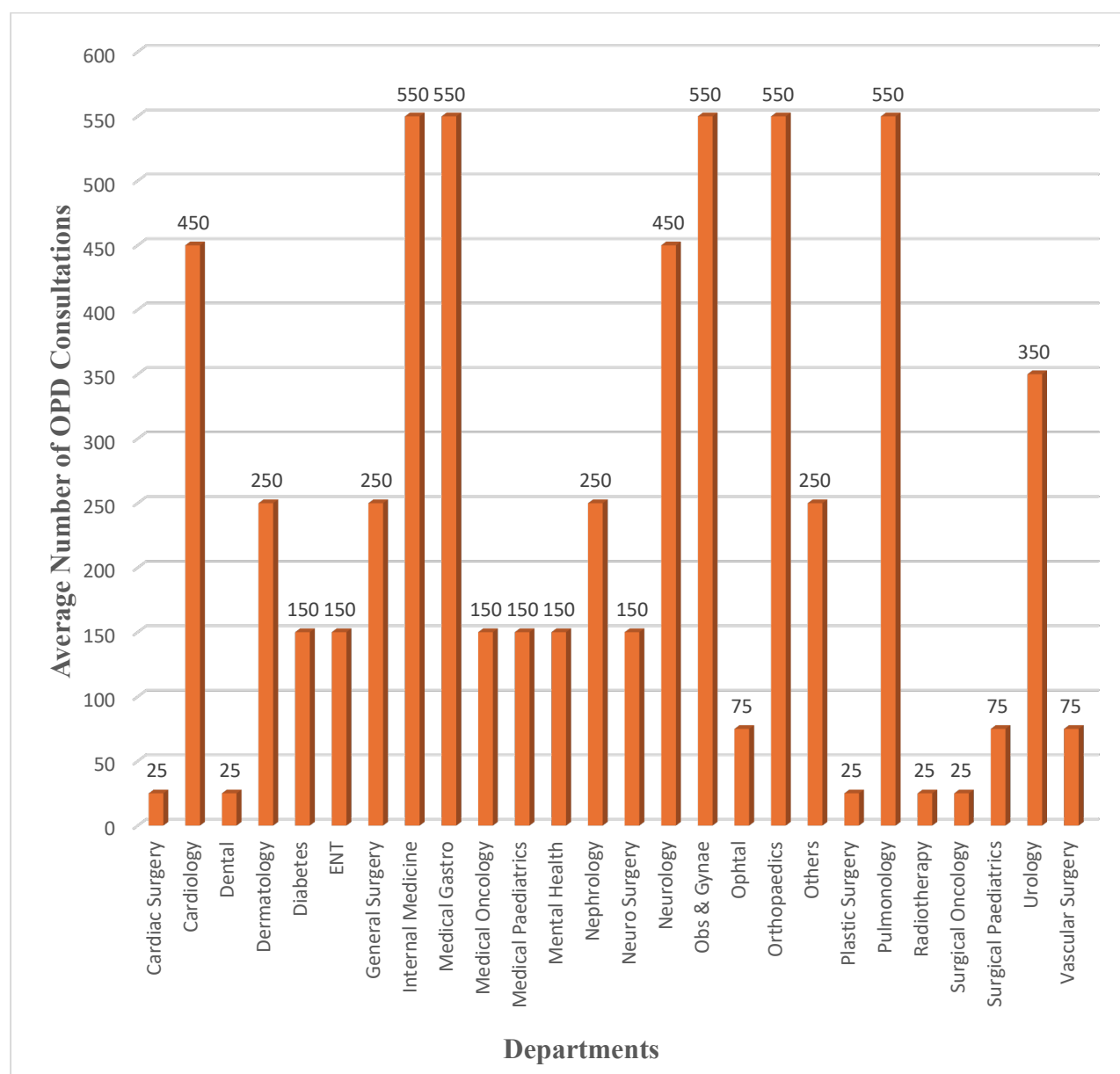


Figure 4.1: Bar Chart of Department-Wise OPD Consultation Categories

Obs & Gynae, Medical Gastro, Internal Medicine, and Orthopaedics had the highest OPD volumes, indicating high patient flow and potential for diagnostic referrals. Low consultation volumes were observed in Dental, Cardiac Surgery, and Plastic Surgery.

4.4 Laboratory Referrals and Conversions

Department	Average Laboratory Advised
Cardiac Surgery	10
Cardiology	36
Dental	0
Dermatology	10
Diabetes	76
ENT	36
General Surgery	76
Internal Medicine	176
Medical Gastro	176
Medical Oncology	10
Medical Paediatrics	36
Mental Health	0
Nephrology	176
Neuro Surgery	10
Neurology	36
Obs & Gynae	250
Ophtal	10
Orthopaedics	76
Others	0
Plastic Surgery	10
Pulmonology	126
Radiotherapy	0
Surgical Oncology	0
Surgical Paediatrics	0
Urology	126
Vascular Surgery	10

Table 4.2: Average Laboratory Drop-Downs Advised by Department

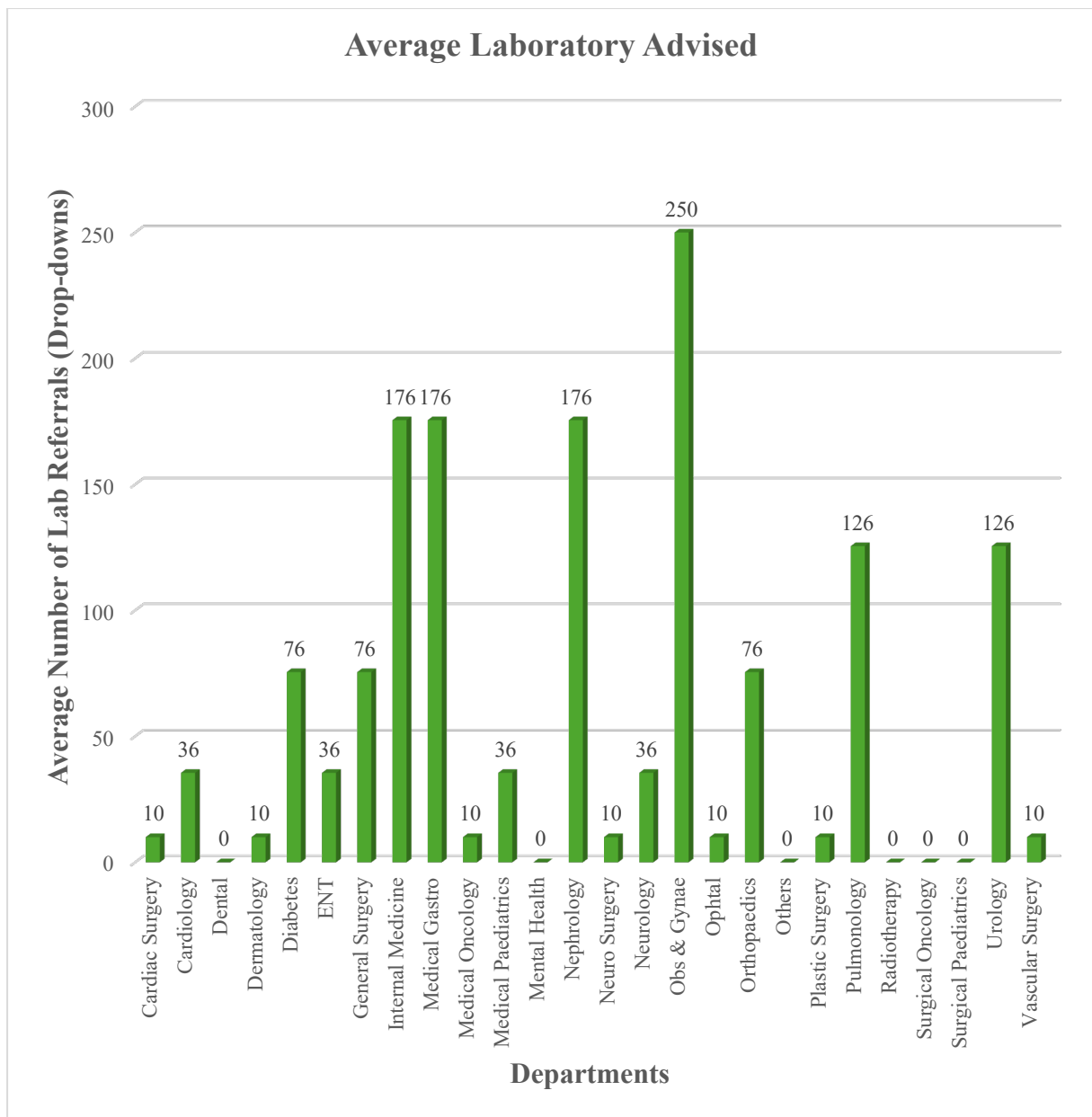


Figure 4.2: Bar Chart Showing Average Laboratory Drop-Downs Advised by Department

Departments like Obs & Gynae, Internal Medicine, and Medical Gastro had the highest number of lab referrals. Several departments like Dental, Mental Health, and Surgical Oncology showed minimal or no lab drop-downs advised.

Department	Average Laboratory Conversion
Cardiac Surgery	3
Cardiology	23
Dental	0
Dermatology	0
Diabetes	11
ENT	11
General Surgery	46
Internal Medicine	23
Medical Gastro	81
Medical Oncology	11
Medical Paediatrics	3
Mental Health	0
Nephrology	23
Neuro Surgery	3
Neurology	23
Obs & Gynae	150
Ophtal	3
Orthopaedics	3
Others	0
Plastic Surgery	3
Pulmonology	11
Radiotherapy	0
Surgical Oncology	0
Surgical Paediatrics	0
Urology	81
Vascular Surgery	3

Table 4.3: Average Laboratory Conversions by Department

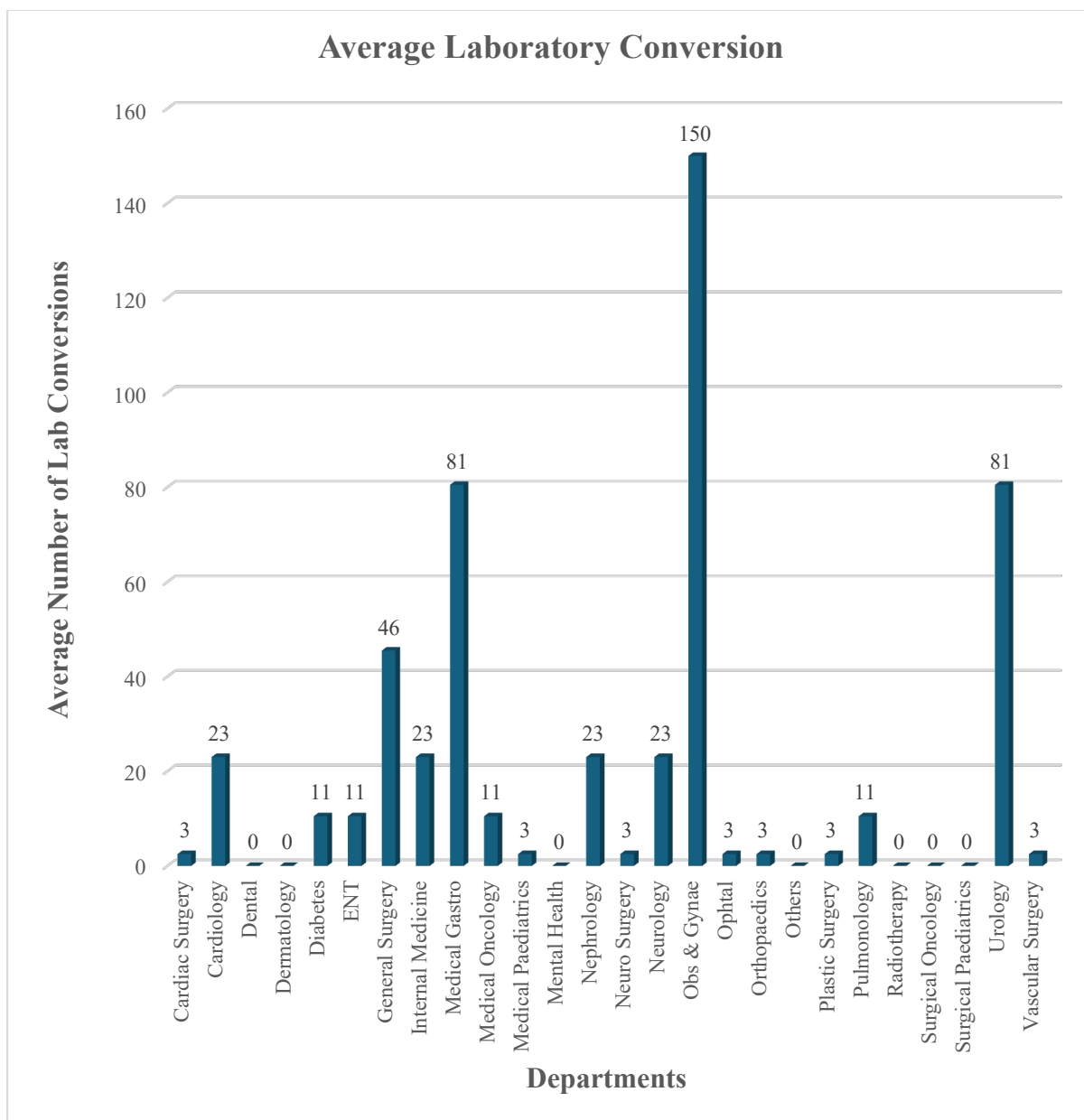


Figure 4.3: Department-wise Laboratory Conversions (Bar Chart)

Obs & Gynae and Medical Gastro converted the most lab referrals into actual tests.

Departments such as ENT, Neuro Surgery, and Medical Paediatrics had poor conversion rates despite advising lab investigations.

4.5 Radiology Referrals and Conversions

Department	Average Radiology Advised
Cardiac Surgery	5
Cardiology	5
Dental	0
Dermatology	0
Diabetes	0
ENT	46
General Surgery	81
Internal Medicine	81
Medical Gastro	81
Medical Oncology	5
Medical Paediatrics	5
Mental Health	0
Nephrology	46
Neuro Surgery	21
Neurology	81
Obs & Gynae	251
Ophtal	5
Orthopaedics	81
Others	0
Plastic Surgery	5
Pulmonology	81
Radiotherapy	0
Surgical Oncology	0
Surgical Paediatrics	0
Urology	151
Vascular Surgery	21

Table 4.4: Average Radiology Drop-Downs Advised by Department

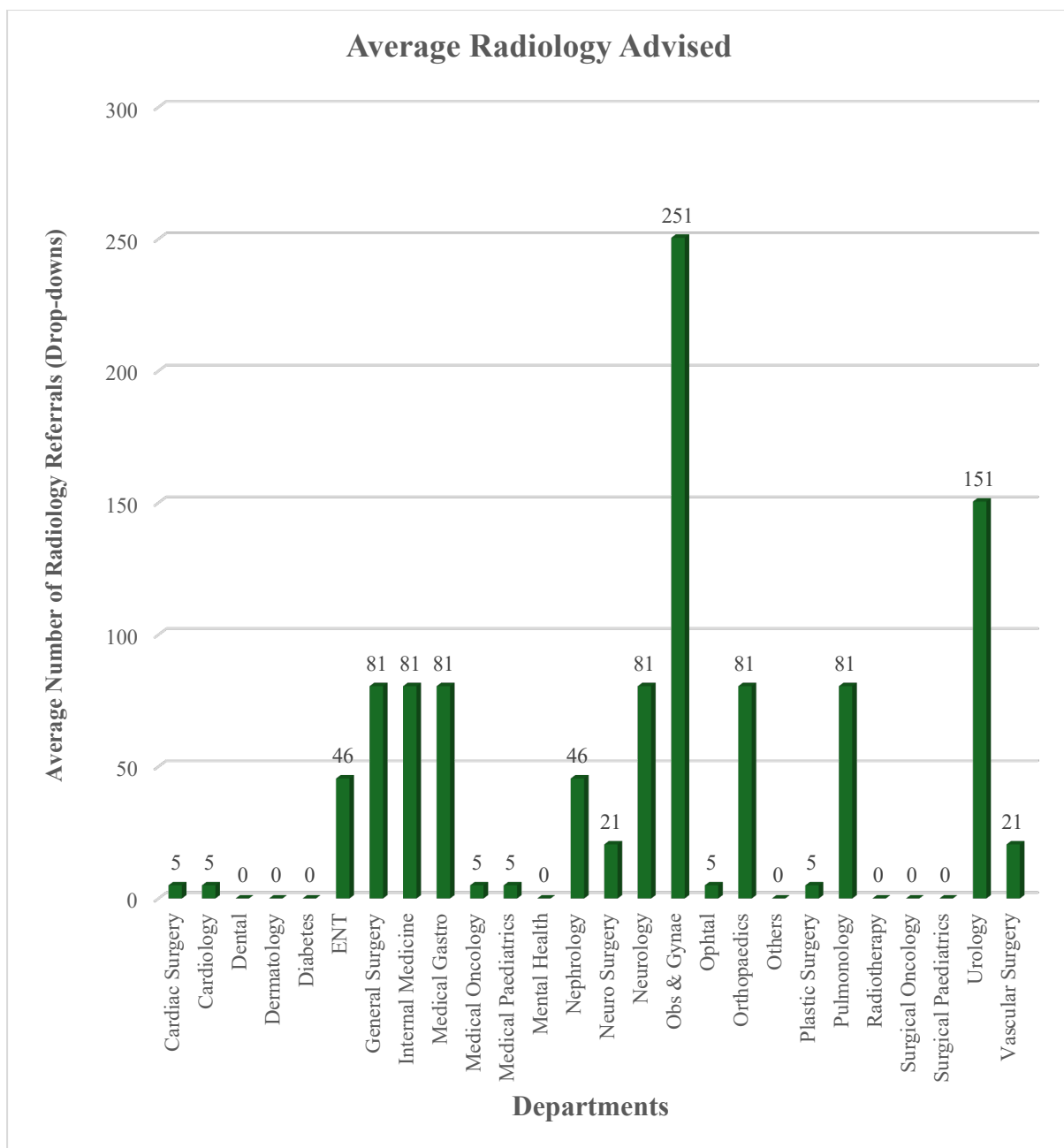


Figure 4.4: Department-wise Radiology Drop-Downs

Radiology referrals were highest from Obs & Gynae, General Surgery, and Internal Medicine. Some departments like Surgical Oncology and Mental Health had zero or negligible radiology drop-downs.

Department	Average Radiology Conversion
Cardiac Surgery	3
Cardiology	11
Dental	0
Dermatology	0
Diabetes	0
ENT	11
General Surgery	46
Internal Medicine	23
Medical Gastro	46
Medical Oncology	3
Medical Paediatrics	3
Mental Health	0
Nephrology	11
Neuro Surgery	23
Neurology	46
Obs & Gynae	81
Ophtal	3
Orthopaedics	23
Others	0
Plastic Surgery	3
Pulmonology	23
Radiotherapy	0
Surgical Oncology	0
Surgical Paediatrics	0
Urology	46
Vascular Surgery	3

Table 4.5: Average Radiology Conversions by Department

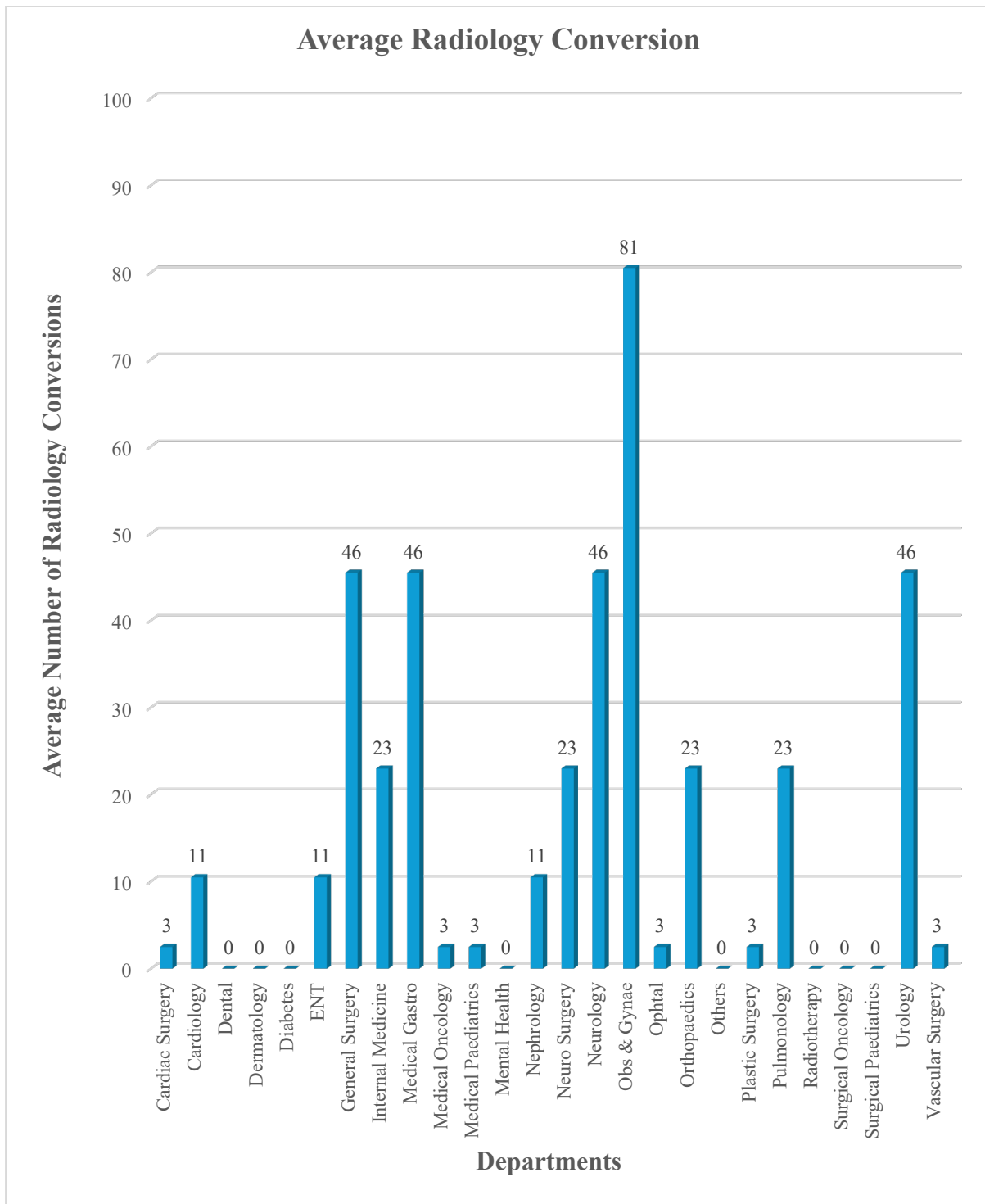


Figure 4.5: Department-wise Radiology Conversions

Obs & Gynae and Medical Gastro led in radiology conversions, while Cardiology and ENT showed weak conversion outcomes despite advising tests. Zero conversions were observed in several minor departments.

4.6 Pharmacy Referrals and Conversions

Department	Average Pharmacy Advised
Cardiac Surgery	25
Cardiology	401
Dental	25
Dermatology	251
Diabetes	76
ENT	151
General Surgery	151
Internal Medicine	601
Medical Gastro	601
Medical Oncology	25
Medical Paediatrics	151
Mental Health	151
Nephrology	151
Neuro Surgery	151
Neurology	401
Obs & Gynae	601
Ophtal	76
Orthopaedics	401
Others	25
Plastic Surgery	25
Pulmonology	401
Radiotherapy	25
Surgical Oncology	0
Surgical Paediatrics	0
Urology	251
Vascular Surgery	76

Table 4.6: Average Pharmacy Drop-Downs Advised by Department

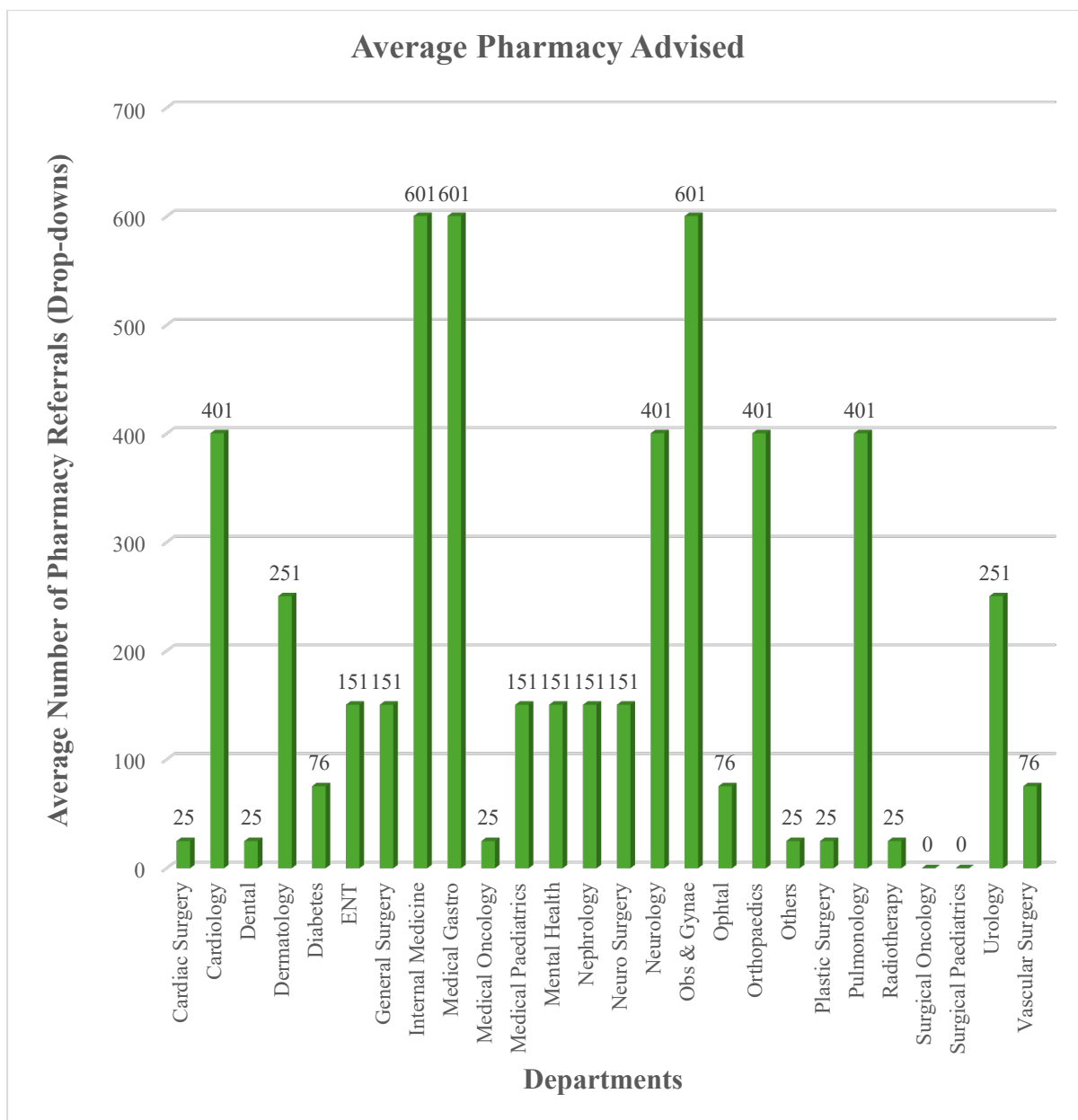


Figure 4.6: Department-wise Pharmacy Drop-Downs

Obs & Gynae, Internal Medicine, and Medical Gastro recorded the highest number of pharmacy drop-downs advised. Some departments like Mental Health, Plastic Surgery, and Surgical Oncology showed little to no activity.

Department	Average Pharmacy Conversion
Cardiac Surgery	21
Cardiology	151
Dental	5
Dermatology	151
Diabetes	21
ENT	81
General Surgery	46
Internal Medicine	251
Medical Gastro	251
Medical Oncology	5
Medical Paediatrics	81
Mental Health	81
Nephrology	46
Neuro Surgery	81
Neurology	151
Obs & Gynae	251
Ophtal	21
Orthopaedics	151
Others	0
Plastic Surgery	5
Pulmonology	151
Radiotherapy	5
Surgical Oncology	0
Surgical Paediatrics	0
Urology	81
Vascular Surgery	21

Table 4.7: Average Pharmacy Conversions by Department

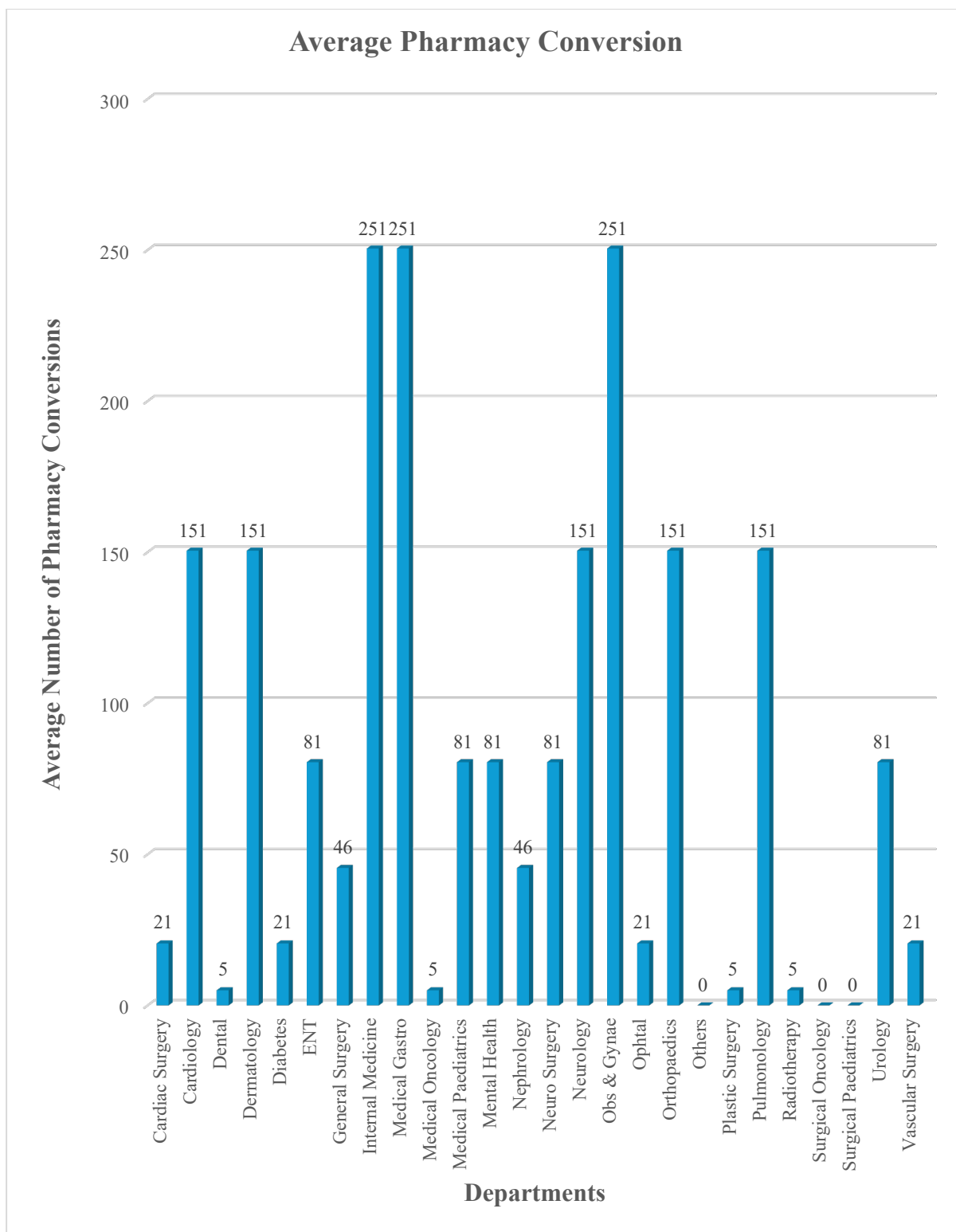
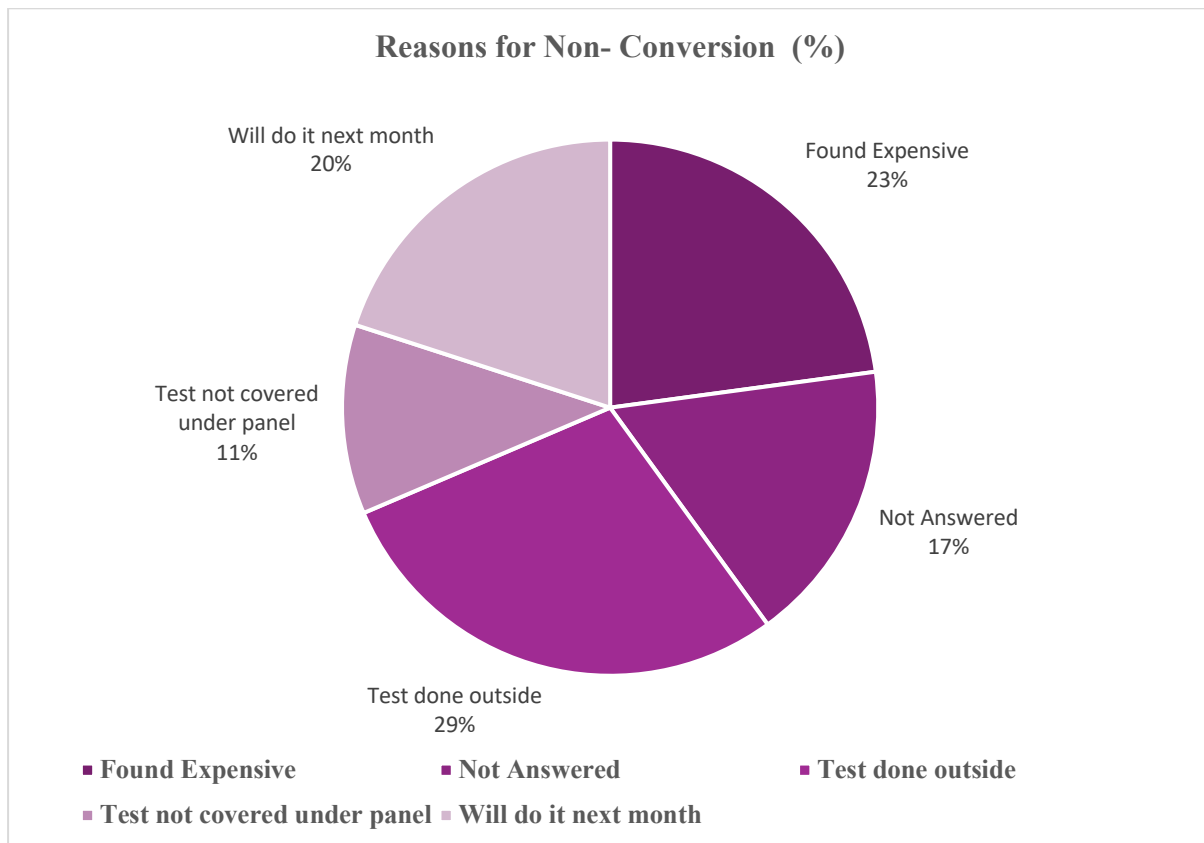


Figure 4.7: Department-wise Pharmacy Conversions

Pharmacy conversions were highest in Obs & Gynae and Medical Gastro. Despite moderate drop-downs, departments like ENT and Neurosurgery had low conversion rates, indicating inefficiencies in medication dispensing follow-through.

4.7 Department-wise Non-Conversions Reasons



Despite the issuance of interdepartmental referrals through the Hospital Information System (HIS), a considerable proportion of patients did not follow through with availing the recommended services. To better understand the factors contributing to this non-conversion, a focused analysis was conducted based on patient feedback and operational inputs. The findings revealed a variety of reasons, each highlighting a specific barrier in the continuum of care.

The most frequently cited reason was that patients had the test conducted outside the hospital. This was often driven by convenience, lower perceived costs, or existing relationships with external providers. Cost-related concerns also played a prominent role, with many patients expressing that the prescribed tests or services were too expensive, especially for those not covered under their insurance or corporate panels.

A notable segment of patients simply stated they would do the test next month, indicating a tendency to delay non-urgent investigations. This form of postponement reflects not only patient mindset but also a potential gap in clinical counselling and follow-up mechanisms.

In other cases, referrals could not be completed due to communication lapses, where patients were not reachable **or** did not respond to reminders. These instances point toward the need for better digital engagement tools and patient tracking systems. Additionally, some patients reported that the recommended tests were not covered under their insurance or TPA panel, making it financially unviable to proceed.

These insights highlight that non-conversion is influenced by a mix **of** financial barriers, patient behavior, external preferences, and system-level inefficiencies. Addressing these issues requires a multipronged approach—combining patient education, real-time counselling, improved communication, and greater transparency about test coverage and costs at the time of referral.

CHAPTER 5: DISCUSSION

This chapter provides a comprehensive interpretation of the study's findings and places them in the context of existing literature. It critically evaluates the departmental variations observed in referral conversion trends across Laboratory, Radiology, and Pharmacy services. The discussion also highlights the strengths and limitations of the study, ensuring a balanced perspective.

5.1 Interpretation of Results

The analysis of referral patterns at Max Super Speciality Hospital reveals some interesting and practical insights into how different departments are engaging with support services like Laboratory, Radiology, and Pharmacy.

Laboratory Services

Departments like **Obstetrics & Gynaecology** and **Medical Gastroenterology** stood out as top performers. Not only did they refer the most patients for lab tests, but a large number of these referrals were also successfully converted into actual tests. This shows a strong coordination between doctors, patients, and the laboratory — likely because these departments deal with conditions that require regular monitoring, like pregnancy or digestive disorders.

On the flip side, departments such as **Dermatology**, **Dental**, and **Mental Health** either advised very few tests or saw very low conversions. This could mean that either lab tests aren't routinely needed in these areas or that patients were not adequately followed up after the referral was made.

Radiology Services

Radiology referrals were highest in departments that deal with complex diagnostic needs — for example, **Obs & Gynae**, **General Surgery**, and **Internal Medicine**. However, even in these departments, not all referrals resulted in patients actually getting the scans done. This suggests potential hurdles like limited imaging slots, delays in appointment scheduling, or patients choosing to postpone.

Interestingly, departments like **ENT** and **Cardiology**, while advising radiological investigations, had low conversion rates. It may be that patients didn't follow through, or perhaps there were delays in processing, indicating a gap between what was recommended and what was completed.

Pharmacy Services

When it comes to pharmacy referrals, the data paints a clearer picture. **Internal Medicine**, **Obs & Gynae**, and **Medical Gastro** once again led with high prescription volumes and relatively strong conversion rates. These departments often deal with chronic conditions or recurring medication needs, so it makes sense that patients were more likely to fill prescriptions.

However, departments like **Dental**, **Plastic Surgery**, and **Surgical Oncology** had low or even zero pharmacy conversions despite having some referrals. This might mean patients were unaware of where to collect medicines, faced stock issues, or simply didn't return to the pharmacy to complete the process.

These variances suggest that referral conversion is influenced by multiple factors, including:

- Departmental standard operating procedures (SOPs)
- Patient compliance and willingness
- Clarity of communication by the consulting physician
- Administrative efficiency (billing, scheduling, stock management)
- Time-sensitive nature of referrals

5.2 Comparison with Literature

The study's findings correlate well with existing research in the domain of referral system performance:

- **Banerjee et al. (2023)** and **Mehta et al. (2022)** emphasized that structured digital tools significantly improve referral conversion by ensuring accountability and providing alerts for pending actions.

- Similar to **Deshmukh & Iyer (2020)**, this study found that lack of clear documentation and absence of follow-up mechanisms often lead to underutilization of referred services.
- The **WHO-SEARO Report (2021)** stresses the importance of establishing **Key Performance Indicators (KPIs)** for tracking referral conversions. This aligns with our study's recommendation to develop dashboards and monthly audit systems to detect variance early and intervene promptly.
- **Goyal et al. (2023) – Manual vs E-Referrals** Goyal's study at AIIMS, Delhi, concluded that e-referrals were significantly more efficient than manual ones. Our findings further validate this — departments actively using DRISHTI for referrals showed better performance. Yet, the human element—like counselling, reminders, and workflow—still plays a big role in whether referrals are actually completed
- **Mehta et al. (2022) – Radiology Referral Delays** Mehta's Hyderabad-based study established a direct link between delays in radiology investigations and poorer diagnostic outcomes. In our setting, departments like **ENT** and **Cardiology** demonstrated a similar trend — radiology referrals were made but conversions lagged behind. Factors such as wait times for imaging slots or lack of communication with patients might be contributing here.

Thus, the present study supports global and national findings while contributing local hospital-specific data insights to the body of knowledge.

5.3 Strengths of the Study

- The study uses real-time, retrospective data, avoiding recall or response bias.
- The total enumeration method provided a complete and inclusive dataset, enhancing reliability.
- Monthly analysis across three departments enabled interdepartmental comparisons, adding depth to the operational review.
- HIS-based data ensured standardization in tracking referrals and conversions.
- Visual trends through charts offered intuitive understanding for administrators and decision-makers.

5.4 Limitations of the Study

- The study is based on data from a single hospital and may not be generalizable to different healthcare settings or geographies.
- It covers only three months (Jan–Mar 2025), limiting long-term trend analysis.
- The study did not include patient-level demographic or behavioral factors, such as age, literacy, or perceived urgency, which may influence conversion.
- Certain external variables (e.g., weather, festival season, policy changes) that could affect service utilization were not controlled.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study explored the efficiency of interdepartmental referral conversions from the Outpatient Department (OPD) to three critical support services—Laboratory, Radiology, and Pharmacy—within a tertiary care hospital setting. By analyzing departmental trends over a three-month period at Max Super Speciality Hospital, Shalimar Bagh, it was evident that while the referral process is digitally integrated and operationally supported, significant variation exists in the actual conversion of referrals into completed services.

Departments such as Obstetrics & Gynaecology, Internal Medicine, and Medical Gastroenterology consistently demonstrated high volumes of referrals as well as strong conversion rates, indicating streamlined coordination, better follow-up practices, and likely higher clinical dependency on diagnostic and therapeutic services. Conversely, departments like Dental, Dermatology, and several surgical specialties exhibited low or negligible conversion rates, despite some initiating a fair number of referrals. These variances reflect systemic gaps that may include inadequate patient follow-up, lack of tracking mechanisms, limited patient engagement, or workflow inefficiencies.

Overall, the study underscores the importance of referral conversion as not merely an administrative metric but as a vital indicator of clinical integration, operational efficiency, and service responsiveness. The findings also highlight the value of leveraging hospital information systems, coupled with departmental accountability, to ensure that referred services are not only advised but are effectively delivered to patients in a timely manner.

Crucially, the findings position referral conversion not as a passive administrative output, but as a dynamic and strategic performance indicator. It reflects how well departments are integrated into the care continuum, how actively they support post-consultation patient engagement, and how effectively services are being utilized. The presence of a referral in the system does not guarantee service utilization; it requires a coordinated push from clinical teams, support services, and administrative workflows.

This study underscores the critical need to move beyond referral issuance and focus on **referral completion** as a metric of operational maturity. Integrating real-time dashboards,

standardizing follow-up protocols, and embedding conversion rates into department KPIs can help bridge this execution gap. By doing so, hospitals not only improve internal efficiency but also elevate the quality and continuity of care provided to patients.

6.2 Recommendations

Based on the findings of this research and supported by literature from WHO and national studies, the following **strategic and operational recommendations** are proposed to improve referral conversion performance:

- 1. Implement a Real-Time Referral Tracking Dashboard**

Develop a digital referral monitoring dashboard integrated into the HIS. This should allow administrators to view real-time referral status, pending actions, and departmental performance metrics.

- 2. Train Departmental Coordinators on Referral Protocols**

Conduct periodic training for department staff and coordinators on the importance of timely referral closure, follow-up communication, and documentation completeness. This improves accountability and SOP compliance.

- 3. Introduce Automated Alerts for Pending Referrals**

Integrate automated SMS or HIS-based alerts for referrals that remain unconverted beyond 24–48 hours. This nudges departments to follow up and prevents patient dropouts.

- 4. Standardize and Review Departmental SOPs**

Regularly audit and update Standard Operating Procedures (SOPs) for referral handling. Ensure all staff are aligned on expectations for advising, documenting, and tracking referrals.

- 5. Conduct Monthly Referral Conversion Audits**

Institutionalize a monthly audit mechanism where referral data is reviewed by the quality department. Identify departments with recurring lags and engage them in root cause analysis and action planning.

- 6. Enhance Patient Communication and Engagement**

Use multi-channel patient engagement tools (SMS reminders, WhatsApp messages,

app notifications) to remind patients about pending tests or prescriptions. This can improve conversion by addressing forgetfulness or perceived non-urgency.

7. Evaluate Interdepartmental Coordination Mechanisms

Form an interdepartmental review committee to assess cross-functional barriers in referral processing—especially between OPD, Radiology slots, and Pharmacy queues.

8. Incorporate Referral Conversion into Performance Appraisals

Include conversion metrics as part of departmental KPIs or performance dashboards.

This promotes ownership and motivates staff to optimize service follow-through.

6.3 Final Reflection

Working on this study has been more than just an academic exercise—it has been a journey into the real-world workings of hospital care. Behind every referral number, graph, and percentage was a story: a patient who needed a test, a doctor who made a decision, a department that had to follow through. As I analyzed the data from Max Super Speciality Hospital, I began to see patterns that spoke not just of statistics, but of how people and systems come together (or sometimes fall short) to deliver care.

What stood out to me the most was how small delays or missed follow-ups can create real consequences—not just for hospital efficiency, but for patient experience. Departments that had strong coordination and clearer processes saw better outcomes, while others highlighted where things could slip through the cracks. It reminded me that good healthcare is as much about teamwork and accountability as it is about technology or infrastructure.

This project has helped me understand how critical it is to pay attention to the “in-between” moments in patient care—those transitions from one department to another, from a referral to an action. It’s in these moments that a hospital either works as a seamless unit or risks losing its grip. I hope that the insights from this study will spark meaningful changes and encourage more hospitals to look closely at how their internal systems are performing.

More than anything, this study has deepened my appreciation for the invisible work that keeps a hospital running and the impact thoughtful management can have on patient lives.

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