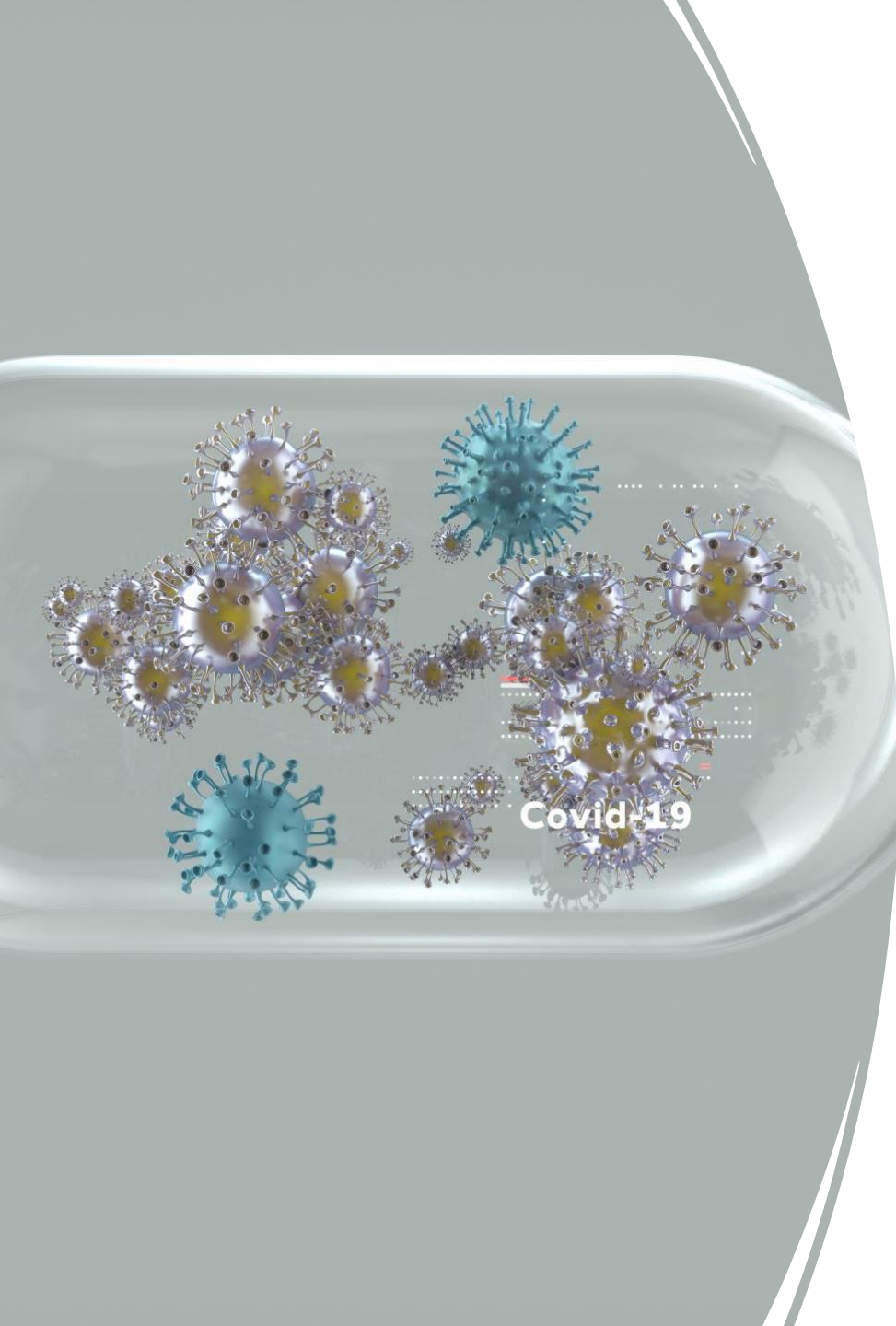




Study on Patterns of Surgical Antibiotic Prophylaxis and its outcomes

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IN GUIDANCE OF

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INTRODUCTION

- **Introduction to Paras Hospital, Gurugram**

Overview

- Paras Hospital, Gurugram, is a leading healthcare institution renowned for its comprehensive medical services and advanced healthcare facilities. Established with a vision to provide world-class healthcare services to the community, Paras Hospital has emerged as a trusted name in the healthcare sector, offering a wide range of medical specialties, cutting-edge technology, and a team of highly skilled medical professionals.

Historical Background

- Paras Healthcare, the parent organization of Paras Hospital, was founded with the aim of addressing the growing need for quality healthcare services in India. The Gurugram facility a 250 bedded hospital, one of the flagship hospitals under the Paras Healthcare umbrella, was established to cater to the healthcare needs of the rapidly growing population in the National Capital Region (NCR). Since its inception, Paras Hospital, Gurugram, has been committed to delivering patient-centric care, fostering innovation, and maintaining high standards of medical excellence.

Vision and Mission

- The vision of Paras Hospital is to be a leading healthcare provider, offering affordable and accessible medical services to all sections of society. The hospital aims to set benchmarks in healthcare delivery through the adoption of best practices, continuous quality improvement, and patient safety initiatives.
- The mission of Paras Hospital includes:
 - Providing Quality Healthcare: Ensuring the delivery of high-quality medical care through a multidisciplinary approach, advanced technology, and skilled healthcare professionals.
 - Patient-Centric Approach: Focusing on patient care and satisfaction by providing compassionate and personalized services.
 - Innovation and Excellence: Promoting innovation in healthcare practices and maintaining excellence in medical services.
 - Community Health: Contributing to the well-being of the community through health education, preventive care, and outreach programs.

INTRODUCTION

- **Surgical Antibiotic Prophylaxis and Its Importance**

- Surgical antibiotic prophylaxis (SAP) refers to the preemptive administration of antibiotics before surgical procedures to prevent postoperative infections, specifically surgical site infections (SSIs). The primary goal of SAP is to reduce the microbial load at the surgical site, thereby minimizing the risk of infection that could complicate the postoperative course. Effective SAP not only protects patients from potential infections but also contributes to the overall success and safety of surgical procedures.

- **Prevalence and Impact of Surgical Site Infections**

- Surgical site infections are among the most common healthcare-associated infections, accounting for a significant portion of postoperative complications. These infections can lead to prolonged hospital stays, increased healthcare costs, and higher morbidity and mortality rates. SSIs affect patient outcomes by causing pain, delayed wound healing, and, in severe cases, systemic infections such as sepsis. The prevalence of SSIs varies depending on the type of surgery, the patient's underlying health conditions, and the adherence to preventive measures, including SAP.

INTRODUCTION

- **Rationale Behind Using Antibiotics for Prevention**

- The rationale for using antibiotics prophylactically in surgery stems from the need to curb the introduction and proliferation of pathogens during and after the surgical procedure. The surgical environment, despite sterile techniques, can inadvertently expose the wound to microbial contamination from the patient's skin, the surgical instruments, or the operating room environment. Administering antibiotics within a critical time window before the incision ensures adequate tissue concentrations of the drug, providing a protective barrier against potential infections. This practice is rooted in evidence-based guidelines and has been shown to significantly reduce the incidence of SSIs, thereby improving patient outcomes and optimizing healthcare resources.

- surgical antibiotic prophylaxis protocol involves timely administration of appropriate antibiotics, typically within 60 minutes before surgical incision, based on local resistance patterns and surgical factors. It emphasizes single-dose administration in most cases to minimize antibiotic exposure, with considerations for redosing during prolonged procedures or significant blood loss. Strict adherence to the protocol, including documentation and monitoring for compliance, is essential to mitigate surgical site infections while minimizing the risk of antibiotic resistance and adverse effects. Regular review and adjustment of the protocol ensure alignment with current best practices and local epidemiology

AIMS AND OBJECTIVE OF THE STUDY

- **Research Question:**

What are the patterns and outcomes of surgical antibiotic prophylaxis in preventing surgical site infections (SSIs) at Paras Hospital Gurugram, and how can prophylactic protocols be optimized based on these findings?

OBJECTIVE :

- **To analyse the patterns of antibiotic prophylaxis in surgical procedures**
- **To assess the relationship between antibiotic prophylaxis and surgical site infections (SSIs)**
- **To identify key factors associated with the successful prevention of SSIs**
- **To provide evidence-based recommendations for optimizing antibiotic prophylaxis protocols**

METHODOLOGY:

- **Research Design:**

This study utilizes a retrospective cohort design to analyze data from patient records. The aim is to evaluate the effectiveness of different antibiotic prophylaxis regimens and identify factors associated with successful prevention of SSIs.

- **Study Location:**

The study was conducted at Paras Hospital, Gurugram, a multi-specialty hospital with a wide range of surgical departments.

- **Study Duration:**

Data collection covered surgical procedures performed from April 1, 2024, to May 31, 2024.

METHODOLOGY:

- **Study Population:**

The study included patients who underwent surgical procedures at Paras Hospital Gurugram during the specified study period.

- **Inclusion Criteria:**

- Patients who underwent surgical procedures between April 1 and May 31, 2024.
- Patients who received antibiotic prophylaxis as part of their surgical care.
- Complete patient records including date of surgery, type of surgery, department, antibiotics administered, incision time, and relevant remarks.

- **Exclusion Criteria:**

- Patients with incomplete or missing data on key variables.
- Patients who did not receive prophylactic antibiotics.
- Patients with pre-existing infections at the surgical site.

METHODOLOGY

- **SAMPLE SIZE:** The sample size was determined based on the total number of eligible surgical cases at Paras Hospital Gurugram during the study period . n= 981

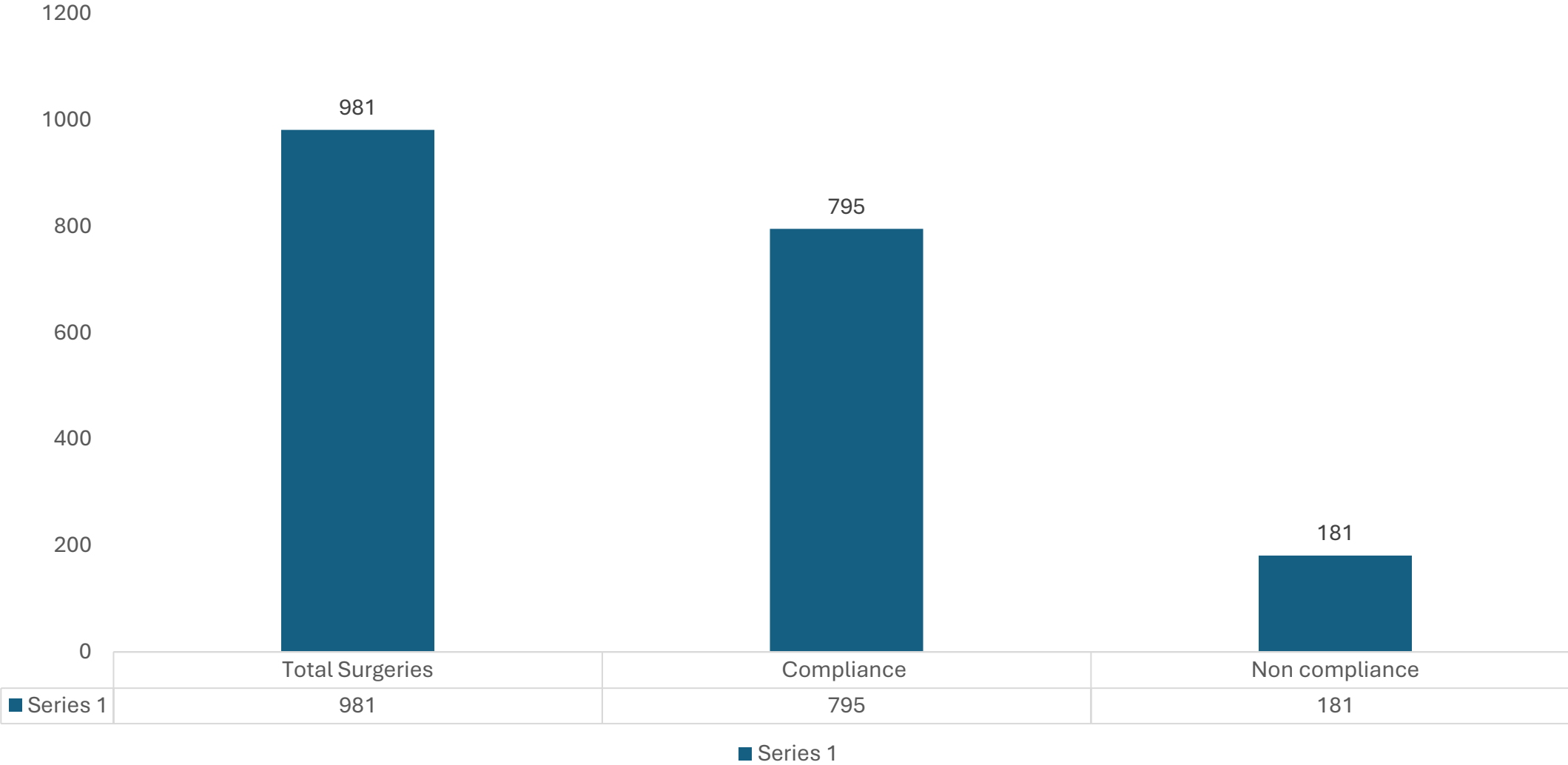
Data Collection:

Data were extracted from the hospital's electronic medical records system, focusing on the following variables:

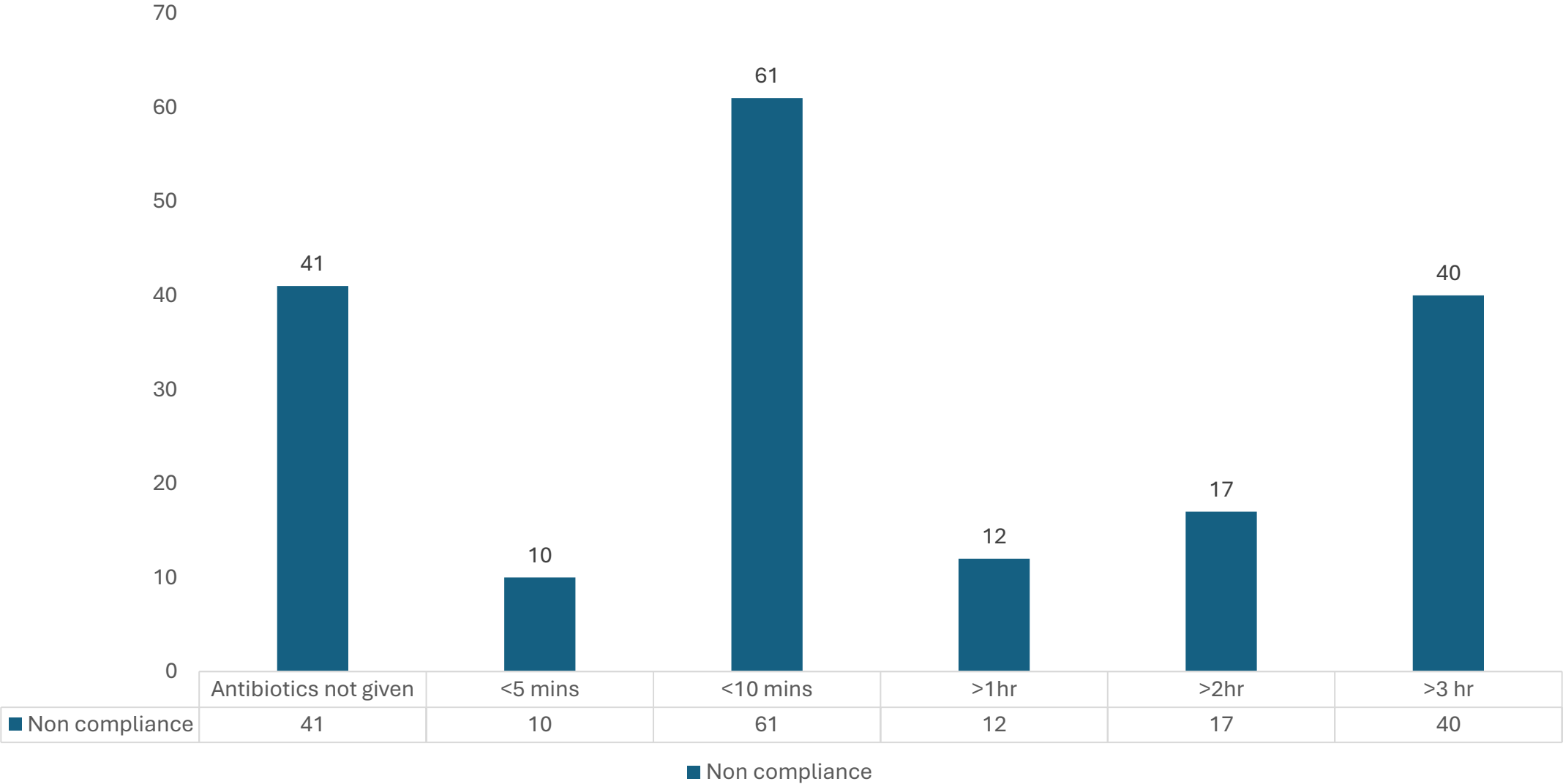
- **Date of Surgery:** The specific date on which the surgery was performed.
- **Surgery Done:** The type of surgical procedure conducted.
- **Department:** The medical department responsible for the surgery.
- **Antibiotics:** Details of the antibiotics administered for prophylaxis, including type and dosage.
- **Incision Time:** The time when the surgical incision was made.

OBSERVATIONS AND RESULTS

Distribution of compliance to SAP Guidelines



Breakdown of Non compliance to SAP Guidelines



Total Surgeries	981
Total Compliance-795(Duration within time frame 15-60mins)	81%
1) Antibiotics not given	41
Department:	
OPHTHAL	18
CTVS	1
SURGICAL ONCOLOGY	9
NUEROSURGERY	10
ENT	16
MAS	29
ORTHOVASCULAR AND PLASTICS	31
UROLOGY	44
OBG	23
Total Non Compliance	66
Non compliance breakup	
Duration not appropriate	181
10mts gap	61
>1hr	12
>2hr	17
5mt	10
>3hrs	40

TABLE 4.1 show the total number of 981 surgeries performed in paras hospital gurugram from April to May 2024 out of 795(81%)procedures where done where proper surgical antibiotic prophylaxis was given(15-60mins before time of incision) . Total non compliance was 186 out of which in 46 cases antibiotic was not given and Urology Department accounted for the highest number of cases (24%).

DISTRIBUTION OF SURGERIES ACROSS DEPARTMENTS

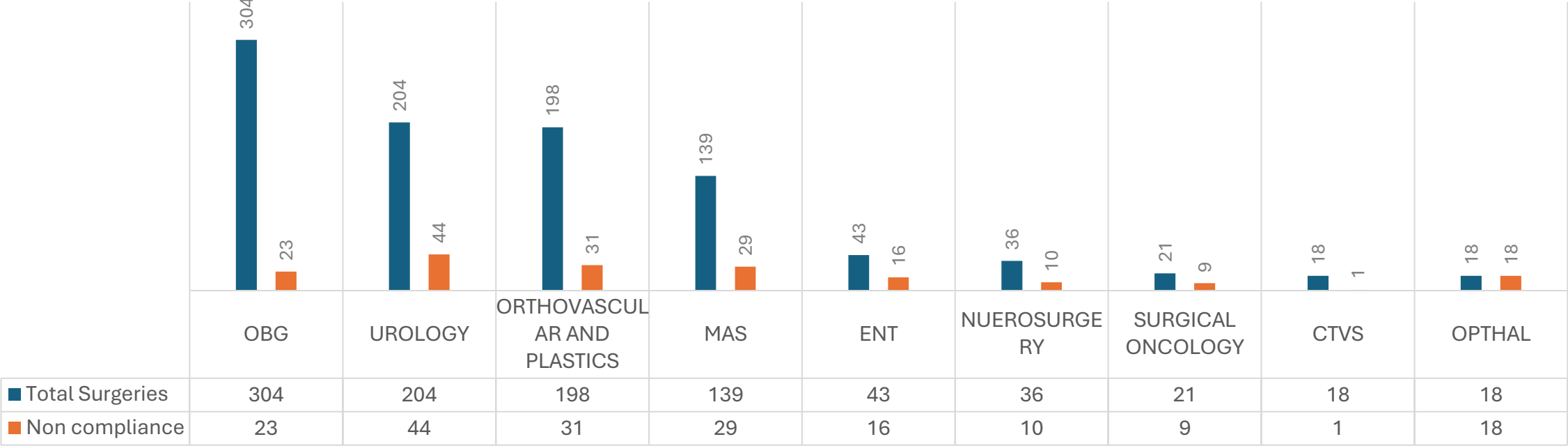


FIGURE 4.1 show the total number of 981 surgeries performed in paras hospital gurugram from April to May 2024 out of which OBG 304, (30.9%) performed the highest number of surgeries while CTVS and Opthal 18, (1.83%) accounted for the lowest number of procedures done .`

DISTRIBUTION OF ANTIBIOTICS ADMINISTERED AND BREAKDOWN OF NON COMPLIANCE

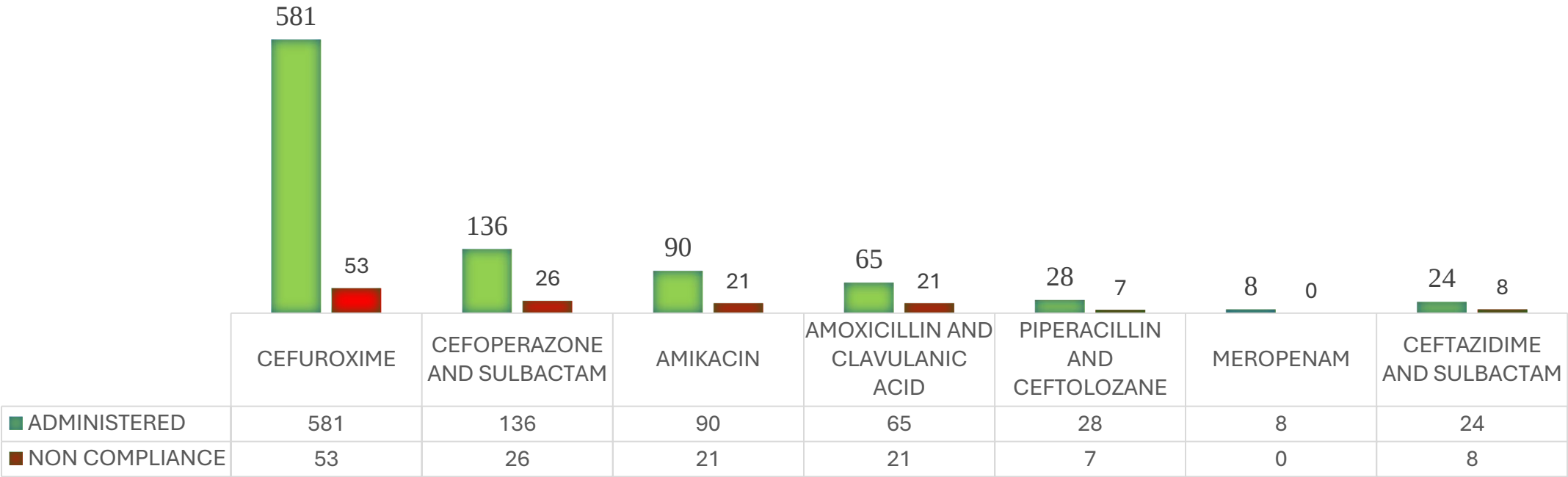


FIGURE 4.3 shows the comparison of non-compliance in the different antibiotic administered with Inj augmentin accounting for the highest percentage of non compliance with 21 out of 65 procedures(32.3%) .Inj supracef even though being the most commonly used antibiotic only 53 cases were non-compliant (9.12%).

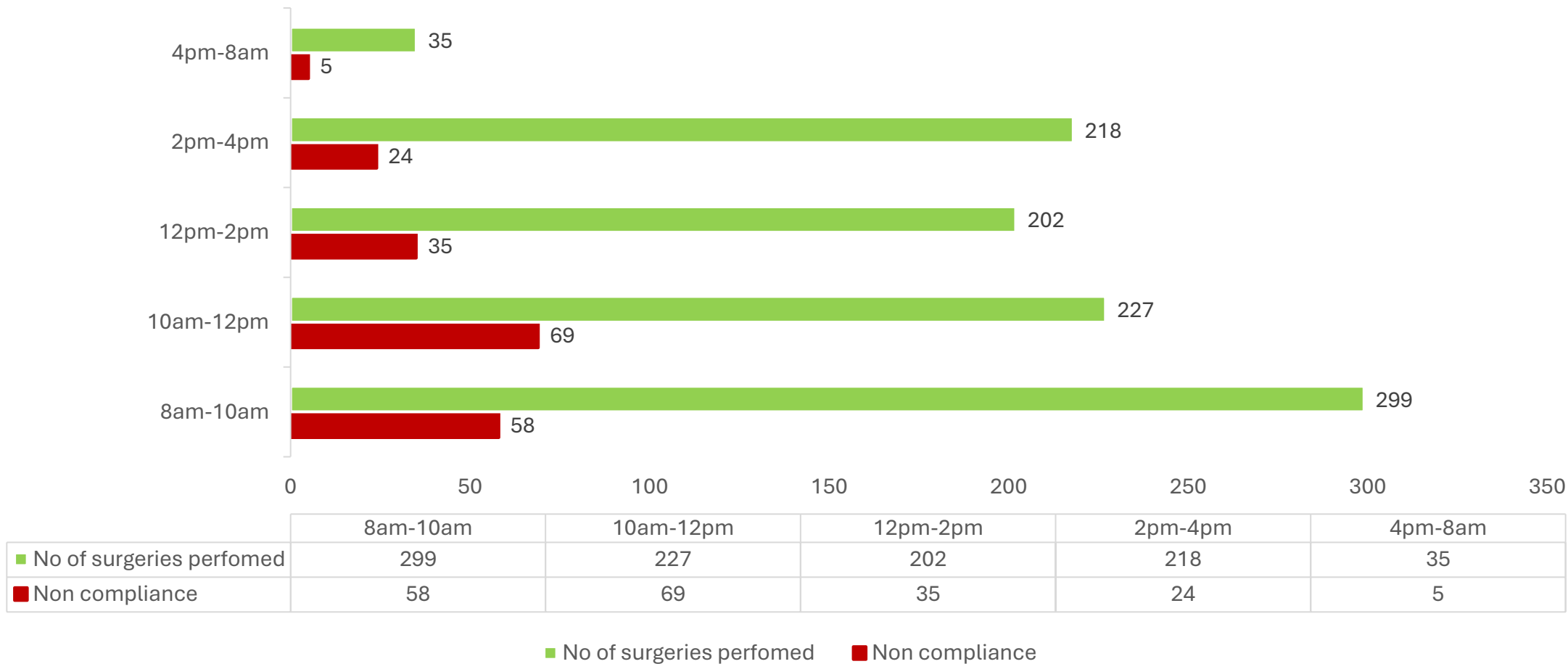


FIGURE 4.4 shows the Time Distribution of surgeries performed with comparison to non-compliances during that period. Most of the Non compliances were distributed towards the morning surgeries with 10-12pm surgeries having the highest No of non-compliance

HIGHEST PERFORMED SURGICAL PROCEDURES WITH COMPARISON TO NON COMPLIANCE

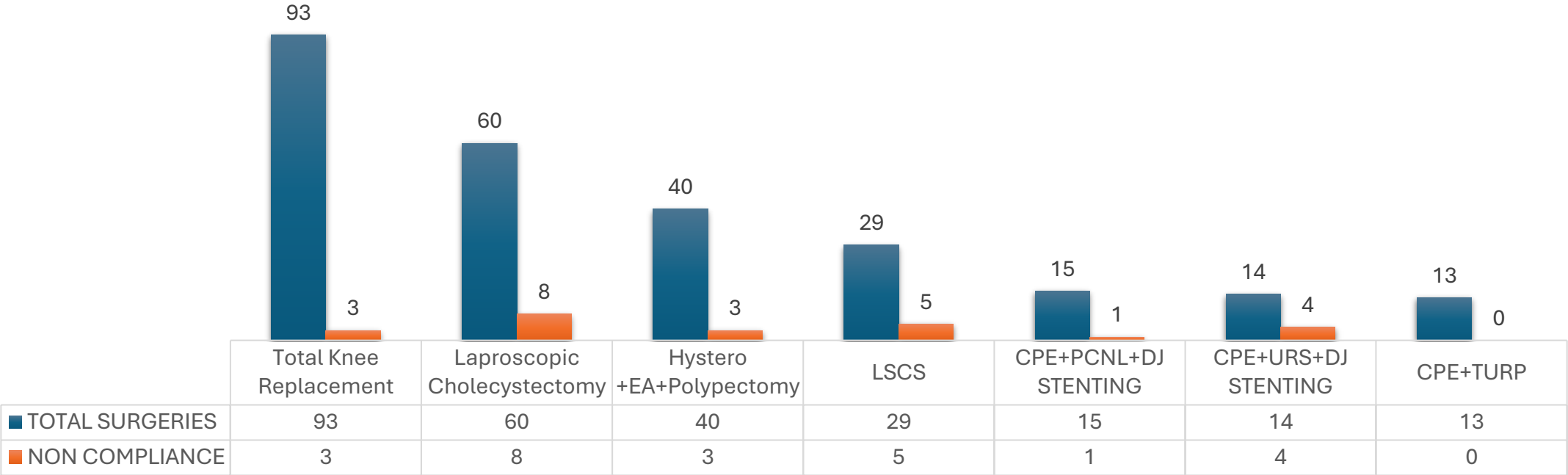


FIGURE 4.5 shows the Distribution of Surgical procedures performed with comparison to non-compliances during that period. TKR was the most performed surgery with 93. Lap cholecystectomy had the highest no of non-compliance with 8. LSCS had the highest percentage with 5 out of 29 (17%)

Surgical Procedure Done	Date of surgery	Date of SSI	Compliance	Antibiotics Administered	Culture Report
Hystero +EA+Polypectomy	02-04-24	10-04-24	Non compliance, antibiotic given 3 hrs before Sx.	Augmentin	E.coli (Hospital flora)
Lap cholecystectomy	10-04-24	22-04-24	Non compliance, Antibiotic given 2hrs before Sx	Cefuroxime	Klebsiella(Hospital flora)
LSCS	12-04-24	25-4-24	Non compliance, antibiotic given 3hrs before Sx	Cefuroxime	E.coli(Hospital flora)
CPE+URS+DJ Stenting	17-04-24	28-4-24	compliance ,antibiotic administered 45mins before Sx	Cefoperazone and Sulbactam	Klebsiella(Hospital flora)
Lap cholecystectomy	12-5-24	21-5-24	Non compliance, antibiotic administered 2 hrs before Sx	Cefuroxime	Staph.Aureus(Hospital flora)
TLH+BSO+Adhesiolysis	17-5-24	28-5-24	Non compliance , Antibiotic administered 3hrs before Sx	Augmentin	E.coli Klebsiella(Hospital flora)



RESULTS :

Key Findings and Implications

Compliance and Non-Compliance Patterns:

- The overall compliance rate with antibiotic prophylaxis protocols was 81% (795 out of 981 cases). This indicates a significant adherence to guidelines among surgical teams, which is crucial for minimizing the risk of SSIs.
- Non-compliance was observed in 186 cases (19%). Major reasons included:
- No antibiotic given: 46 cases
- Incision time greater than 3 hours after antibiotic dose: 40 cases
- Most Noncompliance occurred in morning surgeries which suggest that surgeons are not administered additional dose due to the morning dose of antibiotics
- The most commonly used antibiotics were Cefuroxime, administered in 581 cases, followed by Cefoperazone and Sulbactam, Amikacin, and others. However, Amoxicillin and Clavulanic Acid (Augmentin) had the highest non-compliance rate, with 21 out of 65 administrations not adhering to guidelines. They all are short acting antibiotics with Large therapeutic window so there is no contradiction for an additional dose to be given before time of incision.
- Most common surgical procedure was TKR and LSCS had the highest percentage of non compliance with 17 %.



RESULTS

- Incidence of Surgical Site Infections (SSIs):
- Six SSIs were recorded during the study period: four in April and two in May. These infections were concentrated in the OBG (3 cases), Urology (1 cases), and MAS (1 case) departments.
- Notably, Five SSI cases were linked to non-compliance where the surgical incision was made more than two hours after antibiotic prophylaxis. These infections were culture-positive for flora present in the operating theatre, underscoring the critical role of timely prophylaxis.
- Following appropriate antibiotic therapy, all infected wounds healed without complications, highlighting the importance of addressing non-compliance to prevent such infections

DISCUSSIONS

Surgeons' Perception

- One of the key reasons for non-compliance identified in the study was the surgeons' perception that if the patient was already on an antibiotic dose previously, they did not need to be given another prophylactic dose before the surgery. This perception needs to be addressed through targeted education and awareness programs.

Justification for Prophylactic Dose Despite Previous Antibiotic Use:

- **Optimal Tissue Concentration:** Achieving peak antibiotic concentrations at the time of incision is essential for preventing bacterial colonization and subsequent infection.
- **Timing and Half-Life:** Antibiotic levels decline over time, and an earlier dose may not maintain adequate levels throughout the surgical procedure.
- **Targeted Coverage:** The timing of prophylactic antibiotics is designed to cover the period of highest risk for bacterial contamination.
- **Evidence-Based Guidelines:** Guidelines from the CDC and WHO recommend administering prophylactic antibiotics within 60 minutes before incision to maximize efficacy and reduce the risk of SSIs

RECOMMENDATIONS:

- To enhance compliance with antibiotic prophylaxis protocols and reduce the incidence of SSIs, the following strategies are recommended:
- **Education and Training:** Regular educational sessions and workshops for surgical teams to reinforce the importance of timely antibiotic administration and adherence to guidelines as the study also shows increased incidence in cases of non compliance .
- **Protocol Reinforcement:** Implementing stringent protocols and checklists to ensure that prophylactic antibiotics are administered within the recommended time frame before surgery.
- **Real-Time Monitoring:** Utilizing electronic health records and real-time monitoring systems to track antibiotic administration and compliance rates. This can help identify and address non-compliance promptly.
- **Feedback and Audits:** Conducting regular audits of surgical procedures and providing feedback to surgical teams on their compliance rates and SSI outcomes. This can motivate teams to adhere to guidelines and improve patient outcomes.
- **Targeted Interventions:** Developing targeted interventions for departments with higher non-compliance rates, such as OBG, Urology, and MAS, to address specific challenges and improve adherence to prophylactic protocols.



THANK YOU