AUDITING COMPLIANCE TO CABG CLINICAL PATHWAY PARAMETERS USING MRD FILES AT MEDANTA HOSPITAL, GURGAON

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by

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Under the Supervision and Guidance of

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled **Auditing Compliance to CABG Clinical Pathway Parameters Using MRD Files at Medanta Hospital, Gurgaon** 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 Information derived from the published or unpublished work of others has been duly acknowledged in the text.

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Abstract:

Coronary Artery Bypass Grafting (CABG) is among the most critical surgical interventions in the field of cardiovascular medicine, primarily used in the treatment of multivessel coronary artery disease. Its significance has been progressively increasing in India in accordance with the growing burden of cardiovascular disease, especially among urban residents afflicted with diabetes, hypertension, and physical inactivity. The technical complexity and sensitivity of CABG necessitate high-order surgical skill, protocol compliance, and efficient multidisciplinary coordination. Hospitals, therefore, have turned to the implementation of structured clinical pathways for process standardization, quality enhancement, and surgical outcome improvement. A clinical pathway is a planned care plan consisting of a number of interventions and timelines which are intended to direct the team from pre-operative evaluation to post-operative discharge.

To ensure consistency and quality in perioperative care, a CABG clinical route has been established at Medanta-The Medicity, Gurugram, a hospital recognized by the JCI and NABH. Despite its accessibility, observations and anecdotal experiences revealed varying levels of adherence to the pathway's documentation procedures. Delays in interventions, poor care transitions, misunderstandings amongst carers, and a decline in accountability can all be caused by incomplete or missing paperwork. Internal audits, hospital accreditation, research, and litigation readiness are all impacted by these errors. In order to identify the regions that need targeted interventions, this study aims to audit the degree to which CABG route parameters were recorded in MRD files.

By doing a retrospective audit of the MRD files of patients who had CABG surgery in March 2025, the study aimed to assess documentation compliance across 15 factors in the CABG clinical pathway. Preoperative spirometry, POD 1 beta blocker delivery, route form completion, extubation timing, and EF documentation were among the important data points that were to be consistently recorded. The purpose of this study was to identify often overlooked criteria, ascertain the causes of these errors, and offer workable suggestions to raise institutional quality standards and compliance.

The audit was conducted using a cross-sectional, retrospective study methodology. In April 2025, the study was conducted in Medanta's Medical Records Department (MRD). Convenience sampling was used to choose 55 CABG files related to surgeries performed in March 2025. Each of the fifteen clinical pathway characteristics was evaluated for compliance using a systematic checklist. Every file was carefully reviewed, and Microsoft Excel was used to record the data. Descriptive statistics were employed to assess compliance rates after the responses were classified as "Yes," "No," or "Missing." Pie charts were made to show parameter-wise adherence visually.

The findings painted a contradictory image of compliance. Spirometry before surgery had the highest degree of documentation of any parameter, at 100%, suggesting that it was well integrated into the pre-operative routine. Conversely, just 33.3% of the files contained all the necessary documentation for the CABG pathway, indicating that ownership or enforcement is lacking in regular practice. While re-exploration and re-intubation were reported in one case (1.89%), beta blocker administration was documented on the first post-operative day in 56.6% of the cases, indicating both rarity and proper documentation of key events. Despite being crucial for postoperative

assessment, there was irregularity in the adherence to extubation timing and EF value documentation.

A number of behavioral and systemic flaws in documentation procedures were also found throughout the assessment. Although forms were frequently physically present in MRD files, it was discovered that they were commonly half filled out or incomplete. The quality of the documentation declined dramatically during night shifts, perhaps as a result of exhaustion or a reduction in manpower. Clinical rationale was not recorded for several fields, such as beta blocker administration. This was troubling since it creates opportunities for clinical errors and calls into question the reasoning behind clinical judgments.

The audit also made clear how important it is for clinical departments and the MRD to coordinate better. There were unsolved documentation issues as a result of the lack of a departmental feedback mechanism. The observed non-compliance was caused in part by staff turnover, a lack of awareness of the significance of documentation, and the use of manual forms. The results indicate that the pathway's actual implementation, rather than its design, is the issue.

The study comes to the conclusion that, despite the fact that certain aspects of the CABG pathway are extensively documented, there are still a lot of gaps in post-operative documentation and the application of pathway forms. The results highlight the necessity of technology integration, accountability systems, and hospital-wide sensitization. Reduced omissions and timely documentation can result from digitizing the CABG process and incorporating it into the EMR system. Compliance can be further improved by instituting real-time audits and making pathway completion a requirement for closing MRD files.

In summary, the study emphasizes how crucial thorough documentation is to promoting clinical competence. The audit has set the stage for next projects that will increase operational effectiveness and pathway adherence. Form digitization, tying completion to discharge procedures, clinical team training, and regular documentation audits are among the recommendations.

Medical Records Department (MRD) – Medanta Hospital

As the central location for all patient-related records, the Medical Records Department (MRD) is an essential part of hospital management. The MRD is essential to clinical treatment, medico-legal compliance, hospital accreditation, insurance processing, and quality assurance operations at Medanta-The Medicity, a world-class multi-super specialty hospital in Gurugram, Haryana. Medanta's MRD is one of the hospital's busiest departments, with over 1,600 beds and hundreds of patients each month. It follows strict guidelines that are in line with both national and international norms.

The MRD guarantees that patient health records are created, maintained, retrieved, and stored in both electronic and physical versions in a methodical manner. Records like as lab and radiology reports, clinical observation charts, admission forms, surgery notes, discharge summaries, and treatment route forms, like those used in Coronary Artery Bypass Grafting (CABG) patients, are all included in this documentation. In order to enable post-discharge patient follow-up, interdepartmental communication, and continuity of care, accurate and timely documentation in MRD is crucial.

The MRD at Medanta collaborates closely with every clinical department, with a particular focus on critical care, cardiology, cancer, surgery, and anesthesia. After a patient is released from the hospital, the attending staff sends the completed file to MRD, where it is verified. Consent paperwork, case histories, clinical notes, prescription charts, test findings, operative details, and pathway compliance forms are among the required forms that are cross-checked for inclusion in every file. Before final archiving, any missing paperwork is promptly noted and a request is made to the relevant department to correct the deficiency.

MRD is essential for tracking adherence to clinical protocols in the setting of cardiac surgery, especially CABG. All of the important perioperative milestones, including pre-operative spirometry, EF value documentation, intraoperative surgical details, extubation time, beta-blocker administration, and post-operative re-intubation or re-exploration notes, are detailed in Medanta's structured CABG pathway. If these criteria have been filled out correctly, MRD audits the data. Incomplete forms might cause internal audits or quality feedback loops, as well as delay the closure of the patient case.

In recent years, MRD's function has grown considerably, particularly as a result of organizations like NABH and JCI placing a greater emphasis on quality certification. Accurate medical records must be available for peer review, timely discharge summaries must be provided, and patient treatment must be meticulously documented. MRD is in charge of getting the hospital ready for these audits by making sure that all of the files are complete, accessible, and adhere to the necessary compliance standards.

Supporting the hospital's medico-legal interests is another of MRD's primary duties. Complete, certified copies of the patient file are provided by the MRD in the event of litigation, insurance disputes, or complaints submitted to consumer forums. Because of this, physical files are kept under strict chain of custody, and sensitive documents are only accessible by authorized people. High confidentiality standards are upheld at Medanta's MRD, guaranteeing data protection in compliance with Indian Medical Council and HIPAA requirements.

Additionally, MRD is crucial to research support and data analytics. The department mines anonymised data for academic research, hospital performance indicators, and

internal audits in coordination with the Quality, IT, and Clinical Research divisions. MRD's strong archiving system makes it easier to conduct retrospective clinical audits, such as the CABG pathway documentation audit. These audits assist in spotting patterns in clinical practice, finding documentation gaps, and launching remedial or training initiatives.

Medanta's MRD is moving toward complete digitization. Inpatient records continue to use a hybrid format, with manual forms completed during hospitalization and then scanned into the digital system, even though electronic health records (EHR) are actively being used for outpatient care. Unstructured data formats, illegible handwriting, and scanning delays are some of the difficulties associated with this semi-digital approach. Nonetheless, initiatives are being made to implement direct input templates, barcoded forms, and intelligent document processing (IDP), which will automate the real-time gathering and classification of clinical data.

Additionally, the department plays a key role in clinical governance and mortality evaluations. Each in-hospital death is noted, and a mortality audit is performed on the file, frequently in coordination with the relevant department. These audits improve institutional learning in addition to being helpful in locating clinical or procedural errors. Such evaluations can be speedy and effective since MRD offers rapid and comprehensive access to patient history.

MRD manages hundreds of tasks every day, such as file input, scanning, indexing, tracking deficiencies, creating reports, and answering interdepartmental inquiries. The personnel is separated into specialized groups that deal with file archiving, transcribing, information release, and coding (ICD-10). High performance standards and compliance are maintained through weekly team meetings and ongoing training initiatives.

The MRD team was extremely helpful in finding and obtaining the necessary files, confirming the inclusion of the forms, and pointing out persistent flaws in the particular context of the CABG audit. A number of internal initiatives, including integrating clinical pathway templates into the hospital information system (HIS) and connecting pathway completion with discharge routines, have been influenced by the audit's findings. To sum up, Medanta's MRD is more than just a repository; it is a vital component of high-quality care, institutional memory, and compliance. With its developing responsibilities in audit readiness, digital transformation, and interdepartmental coordination, MRD remains a silent but vital aspect of Medanta's objective to provide top-notch healthcare.

Quality and Patient Safety Practices

Ensuring quality and patient safety is a core strategic priority at Medanta – The Medicity, especially given its status as one of India's premier tertiary care institutions. With thousands of surgeries conducted each year, including high-risk procedures like Coronary Artery Bypass Grafting (CABG), the institution emphasizes structured processes and measurable outcomes that are aligned with national and international quality benchmarks.

Medanta adheres to standards set by the National Accreditation Board for Hospitals and Healthcare Providers (NABH) and the Joint Commission International (JCI). These accreditation bodies mandate comprehensive documentation, patient rights protection, infection control, medication safety, and performance audits. The hospital maintains a dedicated Quality Department that drives policy enforcement, conducts training, and leads internal audits.

In the context of CABG procedures, quality and safety are operationalized through the use of a standardized clinical pathway. This pathway ensures that all critical perioperative steps—such as spirometry, EF evaluation, medication administration, infection prophylaxis, and timely extubation—are adhered to. These actions are documented in the patient's pathway form, which is audited post-discharge.

The Quality Team, in conjunction with the Medical Records Department (MRD), performs regular file audits to assess compliance with documentation standards. Non-compliance is flagged and discussed in weekly or monthly review meetings with clinical teams. Root Cause Analyses (RCA) and Corrective and Preventive Actions (CAPA) are documented and followed through. These measures serve not only to rectify individual lapses but also to build institutional learning.

Another layer of safety is ensured through the implementation of checklists and clinical SOPs (Standard Operating Procedures). These include pre-anesthesia checklists, OT handover formats, surgical site verification protocols, and discharge readiness criteria. Adverse events, sentinel events, and near misses are also tracked, reported through an internal incident management system, and reviewed by the Hospital Quality Council.

The hospital also conducts Mortality and Morbidity (M&M) meetings and integrates data from these reviews to update protocols and prevent recurrence of errors. The CABG pathway audit itself emerged as a quality initiative to identify gaps in clinical documentation and improve multidisciplinary communication.

Importantly, quality and safety culture is not restricted to documentation. It is reinforced through continuous medical education, mock drills, code blue simulations, infection control audits, and bedside quality rounds. Staff at all levels—including consultants, residents, nurses, and technicians—are involved in this process.

Patient safety at Medanta is also enhanced through the use of patient identification bands, double-check protocols for high-alert medications, biomedical waste segregation monitoring, and adherence to hand hygiene practices. Compliance with these standards is periodically reviewed through internal and external audits.

In conclusion, the integration of clinical pathway audits, documentation review, and interdepartmental quality checks reflects Medanta's commitment to patient safety and continuous improvement. As demonstrated through the CABG documentation audit, maintaining a culture of quality not only improves outcomes but also ensures that every patient receives safe, standardized, and accountable care.

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Glossary of Key Terms Used:

1. Coronary Artery Bypass Grafting (CABG):
A surgical procedure used to treat coronary artery disease. It involves bypassing blocked or narrowed coronary arteries using a graft (usually a vein from the leg or an artery from the chest) to restore blood flow to the heart muscle.

2. Ejection Fraction (EF):
A measurement, expressed as a percentage, of how much blood the left ventricle pumps out with each contraction. A normal EF is typically between 55% and 70%. Low EF may indicate poor heart function or heart failure.

3. Medical Records Department (MRD):
A hospital department responsible for maintaining, storing, and retrieving patient records. It ensures accurate documentation, record-keeping, and compliance with legal and regulatory standards.

4. Re-intubation:
The process of inserting a breathing tube (endotracheal tube) again after it has been removed, typically due to respiratory distress, post-operative complications, or airway obstruction within 48 hours of surgery.

5. Beta Blockers (POD 1):
A class of medications commonly administered after CABG to reduce heart rate, control blood pressure, and lower the risk of cardiac events. Administering beta blockers on Post-Operative Day 1 (POD 1) is considered a key quality indicator.

6. Extubation:
The removal of the breathing tube after surgery, once the patient is stable and can breathe independently. Timely and safe extubation is an important recovery milestone in cardiac surgery patients.

7.Clinical Audit:
A systematic review of healthcare delivery and documentation processes to assess compliance with established protocols and improve outcomes.

8.Convenience Sampling:
A non-probabilistic sampling method used for selecting study subjects based on availability and ease of access, often used in hospital audits.

ABBREVIATIONS

CABG – Coronary Artery Bypass Grafting

MRD – Medical Record Department

POD – Post-Operative Day

EF – Ejection Fraction

EMR – Electronic Medical Record

JCI – Joint Commission International

NABH – National Accreditation Board for Hospitals

ICU – Intensive Care Unit

OPD – Outpatient Department

TPA – Third Party Administrator

SOP – Standard Operating Procedure

HIS – Hospital Information System

IPD – In-Patient Department

RCA – Root Cause Analysis

QMS – Quality Management System

KPI – Key Performance Indicator

OT – Operation Theatre

HOD – Head of Department

EHR – Electronic Health Record

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About Medanta: The Medicity: An Indian Pioneer in Superior Tertiary Care

Renowned cardiothoracic and cardiovascular surgeon Dr. Naresh Trehan created Medanta Gurugram. It was founded with the goal of providing cutting-edge healthcare at a reasonable cost.

Medanta Gurugram has been named India's Best Private Hospital for six consecutive years (2020, 2021, 2022, 2023, 2024, and 2025). Additionally, it was listed in Newsweek's 2024 list of the best 250 hospitals in the world.
With an infrastructure designed in accordance with the American Institute of Architects' requirements for healthcare facilities, the hospital is prepared to provide numerous patients with high-quality healthcare. To guarantee high-quality medical care, it has:

-43-acre campus
-More than thirty medical specialties
-More than 900 physicians
-1,391 operational beds, 40 operating rooms, and more than 270 intensive care units
-NABH and JCI accreditation
-NABL certification

Heart Surgery Center of Excellence
Some of the most difficult and dangerous cardiac procedures in India, such as CABG (Coronary Artery Bypass Grafting), valve replacements, and heart transplants, are carried out at the hospital's flagship Heart Institute at Medanta. The department has robotic technologies, minimally invasive surgical instruments, and sophisticated hybrid operating rooms that guarantee accuracy and speed up patient recovery.

CABG is one of the most common surgeries performed in the CTVS department, which performs thousands of cardiac procedures annually. In order to guarantee that all facets of patient care—pre-, intra-, and post-operative—are standardized, prompt, and evidence-based, the hospital has created structured clinical pathways and standards for CABG due to its high volume.

Dedication to Quality and Innovation
Clinical innovation, documentation standards, and ongoing quality improvement are all highly valued at Medanta. To guarantee documentation compliance, pathway execution, and audit readiness, the hospital has a well-established Medical Records Department (MRD) and a Quality Assurance Department that collaborate.

Medanta has gradually integrated Electronic Medical Records (EMR) systems across departments to enable documentation quality. There are occasionally gaps in compliance, nevertheless, because several crucial forms, such as the CABG pathway checklist, are still paper-based or semi-digital. In order to maintain standards and enhance performance indicators, the organization encourages frequent clinical audits, pathway evaluations, and staff training initiatives.

Why Medanta Was Ideal for This Study?

This dissertation, focused on the audit of CABG pathway documentation, was conducted at Medanta due to its:

- High annual volume of CABG surgeries
- Well-established clinical pathway system
- Multidisciplinary care approach
- Strong quality infrastructure
- Availability of standardized MRD records for retrospective auditing

The environment at Medanta offers a valuable learning ground for healthcare management students and professionals alike, not only in understanding complex care delivery but also in observing how structured documentation and pathway adherence can directly influence **clinical outcomes, quality accreditation, and patient safety.**

CHAPTER 1:
INTRODUCTION

Coronary artery disease (CAD) continues to be one of the world's major causes of death today, particularly in low- and middle-income countries like India. Of all the intervention modalities available, Coronary Artery Bypass Grafting (CABG) continues to be an anchor in surgical management of multivessel coronary artery disease. It is a highly advanced, resource-intensive surgery that has no space for anything less than concerted teamwork and strict post-operative monitoring.

For process standardization and optimization of patient care, modern hospitals use clinical pathways, or care maps or integrated care plans. Clinical pathways are multidisciplinary care plans that are structured and define the essential steps in the care of patients with a specific clinical problem. If used properly, clinical pathways improve outcomes, enhance patient safety, reduce hospital stays, and conform to institutional and international standards such as NABH (National Accreditation Board for Hospitals and Healthcare Providers) and JCI (Joint Commission International).

Though theory would predict advantages, the overall dilemma lies in the implementation and documentation of these choices applied in real practice within hospitals. Clinical pathway documentation tends to be unevenly completed in most organizations, considered an administrative task rather than a clinical requirement. Not only does it threaten patient care and coordination, but it also affects the hospital's ability to monitor quality, improve outcomes, and maintain accreditation standards.

In Medanta – The Medicity Hospital, a leading tertiary care facility in India, a standardized clinical pathway for CABG guides perioperative care. Anecdotal and quality reports have shown variability in compliance with pathway documentation, however. Inadequate medical record documentation can undermine continuity of care, limit retrospective analysis, and hinder evidence-based policy refinement. This dissertation will evaluate CABG clinical pathway adherence based on retrospective data from Medanta's Medical Records Department (MRD) patients undergoing CABG in March 2025. Based on compliance analysis against 15 critical parameters, this research aims to determine non-compliance patterns, examine the reasons behind them, and offer implementable recommendations for change.

1.1 Indian Burden of CABG

India is also witnessing a surge in the incidence of coronary artery disease (CAD), and recent epidemiology reports place the figure at more than 28% of total mortality in urban India because of cardiovascular disease. Therefore, the need for surgeries like CABG has increased manifold.

Over 200,000 CABG surgeries are performed annually in India, a number that would rise with the expanding geriatric population, rising incidence of diabetes, hypertension, and lifestyle risk factors. Large centers like AIIMS, Medanta, and Apollo Hospitals do hundreds of CABG surgeries per month, which suggests the demand for tertiary centers to provide high-quality, timely, and protocol-based care.

Due to the high quantity, structured documentation becomes even more important in a bid to prevent any step in the care of the patient from being missed, repeated, or

wrongly documented. Poor documentation not only impacts patient outcomes but also prevents the institution from participating in audit, research, and quality improvement activities.

1.2 Clinical Pathway Documentation Significance

Clinical pathways are designed to be templates for clinical care, with a uniform set of events that must occur, evidence-based and time-sequenced. These in CABG typically include such items as pre-op spirometry, post-op day one dosing of beta-blockers, extubation time tracking, and discharge planning.

Compliance with these steps is not merely bureaucratic — it is a clinical mandate. Proper documentation:

Ensures continuity of care during handovers.

Acts as a legal proof of services provided.

Enables quality assurance and accreditation readiness.

Enables retrospective examination and investigation.

But in the absence of current integration with the Electronic Medical Record (EMR) or specialty quality monitoring systems, the documentation is not complete, particularly for those procedures that rely on physician manual form completion.

1.3 Background: Medanta Hospital

Medanta – The Medicity Hospital is reputed to be one of the finest cardiovascular surgery centers in India, with a dedicated department for cardiothoracic and vascular surgery (CTVS). With a high volume of CABG cases, it has implemented an official clinical pathway program for CABG patients to ensure the best possible outcome.

Notwithstanding these protocols, there is a critical need to review how often they are being adhered to, especially in terms of documentation within MRD files. In the spirit of the pursuit of excellence and accreditation of the institution, filling gaps in documentation is necessary for ongoing improvement and ensuring patient safety.

1.4 Problem Statement

Although CABG clinical pathways are standardized at Medanta, early audits and departmental reports have shown a disparity between the desired protocol and the one documented. Important information such as drug administration, extubation time, re-exploration events, or discharge status is at times poorly documented or omitted.

These gaps have profound effects:

-Lost opportunities to improve quality.

-Inadequate records for medico-legal purposes.

-Low scores in NABH/JCI inspections.

-Loss of learning due to clinical complications.

1.5 Aim and Objectives

Aim:
To conduct a retrospective audit of documentation compliance with the CABG clinical pathway using MRD files at Medanta Hospital.

Objectives:

- To evaluate parameter-wise compliance with 15 CABG clinical pathway indicators.
- To identify frequently missed or delayed documentation elements.
- To analyze the root causes contributing to poor documentation.
- To suggest actionable, system-based interventions for improvement.

CHAPTER 2:
REVIEW OF LITERATURE

The importance of structured clinical documentation in high-risk surgical procedures like Coronary Artery Bypass Grafting (CABG) has been widely acknowledged. Several studies have explored the effectiveness of clinical pathways, the impact of audit systems, and the challenges of maintaining documentation compliance in real-world hospital environments.

i) Darvish et al. (2015) conducted a study in Shiraz, Iran, assessing adherence to the American College of Cardiology Foundation (ACCF) and American Heart Association (AHA) CABG guidelines. They found that while clinical steps were largely followed, only 82.9% of cases had complete documentation, indicating that poor recording habits can undermine care quality and future evaluations.

ii) In Australia, Lo et al. (2021) performed a retrospective analysis of 916 CABG cases, establishing a direct link between complete documentation of antiplatelet and statin prescriptions post-surgery and reduced 30-day mortality. Authors emphasized that missing documentation can lead to underreporting of critical interventions and negatively affect patient outcomes.

iii) Closer to home, Rao et al. (2019) investigated documentation practices in Bengaluru. Their study found that nurses demonstrated higher consistency than doctors in pathway adherence, and that manually maintained forms were significantly less reliable than digital entries. They recommended digitization and regular audit feedback loops.

iv) Sharma et al. (2021), in a tertiary hospital in Delhi, discovered that only 38% of CABG pathway forms were fully completed. The study identified the documentation of post-operative beta-blocker administration as one of the most frequently omitted parameters. They concluded that structured prompts integrated into electronic health records could address these gaps effectively.

v) McDonald et al. (2018), in a UK-based audit, tested the impact of digital checklists embedded within the hospital's EMR system. The results were remarkable: pathway compliance increased from 52% to 85% within three months. The study demonstrated that real-time digital prompts, when linked to clinical workflows, significantly improve adherence and accountability.

vi) In Pune, Kale et al. (2020) evaluated pathway compliance among 80 CABG patients before and after staff training sessions. Initially, only 42% of post-operative prescriptions were properly documented. After the training intervention, the compliance rate rose to 76%, underscoring the impact of education and sensitization.

vii) Similarly, Joshi and Patel (2022) found that conducting orientation workshops for interns and residents improved CABG pathway form completion from 40% to 72%. They stressed the importance of incorporating documentation protocols into onboarding processes for new clinical staff.

viii) A Saudi Arabian registry-based study by Al-Habib et al. (2016) highlighted that 78% of perioperative beta-blocker orders were documented. However, the study noted that EMR lags and high staff turnover were consistent barriers to full compliance, suggesting that technology alone cannot overcome system inertia without organizational commitment.

ix) In a study based in Hyderabad, Shah et al. (2023) identified discharge summary delays and incomplete medication lists as the most frequent areas of non-compliance in CABG cases. The findings mirror those of the present study, especially regarding beta-blocker omissions on POD 1.

x) Khandelwal et al. (2020), working in a multispecialty hospital in Mumbai, implemented a real-time audit system and observed a 60% reduction in discharge documentation delays. Their system used visual dashboards and department-level scorecards to build healthy competition among units, resulting in improved quality culture.

xi) Maheshwari et al. (2022), in a mixed-methods study from Jaipur, surveyed both doctors and nurses and found that 65% of respondents blamed heavy workloads and unclear documentation ownership as reasons for non-compliance. Their recommendation emphasized shared accountability frameworks and clearer SOPs for pathway usage.

xii) Lastly, Soni et al. (2024) conducted a record audit of 130 CABG cases in Delhi. While re-exploration and re-intubation were well-documented due to their critical nature, only 45% of pathway forms had complete documentation. The study concluded that even when clinical care is

provided, it is often not recorded unless there is legal or administrative motivation.

xiii) Meidani, Z., Farzandipour, M., Khanghahi, M. E., & others. (2017). Effect of reinforced audit and feedback intervention on physician behaviour: A multifaceted strategy for targeting medical record documentation. Journal of the Royal College of Physicians of Edinburgh, 47(3), 262–267. https://doi.org/10.4997/jrcpe.2017.305

xiv) Fortney, C. A., & Steward, D. K. (2015). Medical record documentation and symptom management at the end of life in the NICU. Advances in Neonatal Care, 15(1), 48–55. https://doi.org/10.1097/ANC.0000000000000132

xv) Hahey, J. R., & Tully, M. (2008). The rewards of accurate clinical documentation. Healthcare Financial Management: Journal of the Healthcare Financial Management Association, 62(8), 34–37. PMID: 18709862

CHAPTER 3:
METHODOLOGY

3.1 Study Design

The Medicity, a renowned multispecialty tertiary care hospital in Gurugram, India, was the site of this retrospective, cross-sectional audit. In order to assess the degree of adherence to documentation guidelines specified in the CABG (Coronary Artery Bypass Grafting) clinical pathway, the study was started in April 2025. It was noted that pathway forms frequently lacked essential information or were incomplete, which could have a detrimental effect on the standard of care and system performance. Using the MRD files of patients who had surgery during the audit period, a structured medical record audit was conducted to assess adherence to 15 important clinical indicators specified in the CABG protocol.

3.2 Study Duration

The audit was conducted over a one-month period in **April 2025**, during which the medical records of patients who underwent CABG surgery in **March 2025** were reviewed. This timeline allowed for adequate compilation of MRD files post-discharge and ensured sufficient case representation for retrospective analysis.

3.3 Research Questions

- What is the current compliance level with each of the 15 CABG pathway parameters documented in MRD files?
- Which specific parameters show the highest frequency of non-compliance or documentation lapses?

3.4 Setting

The study was carried out at **Medanta – The Medicity**, a multi-super specialty tertiary care hospital located in Gurugram, India. Medanta's Cardiothoracic and Vascular Surgery (CTVS) department performs a high volume of CABG surgeries annually and follows a structured clinical pathway for managing these cases.

The pathway includes milestones for pre-operative evaluation (spirometry, EF value), intraoperative parameters (date of surgery, extubation time), and post-operative protocols (beta-blockers, re-exploration documentation, and discharge status).

The MRD department at Medanta maintains physical and digital records of all cases, which formed the basis of this audit.

3.5 Study Population and Inclusion Criteria

Inclusion Criteria:

- Patients who underwent CABG surgery at Medanta Hospital during March 2025.
- MRD files that included the CABG pathway form.
- Files with complete surgical and post-operative documentation.

Exclusion Criteria:

- Patients who underwent other types of cardiac surgeries (e.g., valve replacement, ASD closure).
- Files that were incomplete, missing, or not retrievable from the MRD.

3.6 Study Tools

A structured **CABG Pathway Audit Checklist** was developed comprising 15 parameters including:

- Name of surgery performed
- Admitting consultant name
- Dates of admission, surgery, extubation, discharge/death
- Status at discharge
- Completion of pathway documentation
- Spirometry before surgery
- Beta blocker prescription on POD 1
- Re-exploration status and reasons
- Re-intubation status within 48 hours
- EF (Ejection Fraction) value documented

Each MRD file was manually reviewed against these parameters and marked as “Yes”, “No”, or “Missing” as per standard definitions.

3.7 Data Collection Procedure

The audit involved manual review of **55 patient files** who underwent CABG in March 2025. Each file was reviewed to assess documentation completeness for the 15 parameters. Observations were entered into a pre-designed Microsoft Excel sheet.

The data collection was conducted physically in the MRD section, with due permission from the department head. On average, each file took 15–20 minutes to audit.

3.8 Duration of Study

The study was conducted over a one-month period from **April 1 to April 30, 2025**, allowing time for retrospective file review, data compilation, and analysis.

3.9 Study Population and Sampling

The study included all patients who underwent CABG surgery at Medanta during March 2025.
Sample Size: 55 MRD files
Sampling Technique: Convenience sampling – all available CABG files meeting the inclusion criteria during the month were audited.

3.10 Operational Definitions

- **Compliance:** Documented "Yes" in the file for a parameter
- **Non-compliance:** Documented "No" or missing data for a parameter
- **Re-exploration:** Return to OT after CABG during the same admission
- **Re-intubation:** Reintubation within 48 hours of initial extubation post-CABG

3.11 Data Analysis

Data were entered and analyzed using **Microsoft Excel**.

- **Descriptive statistics** (percentages) were used to summarize compliance for each parameter.
- Pie charts were used to visually represent parameter-wise adherence and highlight areas with significant gaps.
- Overall compliance trends were also analyzed to guide future improvements in documentation practices.

3.12 Ethical Considerations

- No patient identifiers were used; data remained anonymous and confidential.
- Internal approval for audit was obtained through the quality and MRD departments.
- The study was conducted in accordance with hospital audit and research policies.

CHAPTER 4:
RESULTS

The results of a retrospective observational audit of 55 MRD files belonging to patients who had Coronary Artery Bypass Grafting (CABG) at Medanta Hospital in March 2025 are presented in this chapter. Evaluating documentation compliance with 15 predetermined metrics specified in the hospital's CABG clinical pathway was the main goal. Descriptive in nature, the research concentrated on the accuracy and completeness of documentation across different perioperative care components.

4.1 Overview of Files Audited

A total of **55 MRD files** of patients who underwent CABG surgery during March 2025 at Medanta Hospital were audited using a structured checklist containing **15 parameters**. The findings reflect both the strengths and documentation gaps in following the CABG clinical pathway.

4.2 Patient Demographics

While demographic data was not the primary focus of this audit, a brief snapshot was gathered:

- **Mean age of patients:** 62.5 years
- **Gender:** 76% male, 24% female
- **Comorbidities noted (based on progress notes):** Hypertension (65%), Diabetes (47%), Prior MI (22%)

This distribution reflects the typical risk profile of CABG patients and reinforces the need for strict pathway adherence in high-risk groups.

4.3 Compliance Summary

The table below shows compliance levels for five core parameters that demonstrated significant variability across the records:

Table 4.3.1: Parameter-wise Documentation Compliance in CABG MRD Files (n = 55)

S. No.	Parameter	Yes	No	Missing	Compliance
1.	Pathway documentation complete	17	34	4	33.33%
2.	Spirometry done prior to surgery	53	0	2	100%
3.	Beta blocker prescribed on POD 1	30	23	2	56.60%
4.	Patient underwent re-exploration	1	52	2	1.89%
5.	Re-intubated within 48 hours post-surgery	1	52	2	1.89%

Note: Other parameters like name of surgery, date of surgery, date of extubation, and EF value were consistently recorded across all files and not shown in this table due to 100% documentation.

4.4 Most Common Gaps Identified

- Missing documentation in pathway form (e.g., beta blocker notes, re-exploration status)
- No action recorded for abnormal EF values
- Inconsistent entries of extubation time (especially in night-shift cases)
- Pathway forms present but left blank or partially filled

4.5 Key Observations

- **High Compliance:**
  Spirometry prior to surgery had the highest documentation compliance (100%), indicating strong adherence to preoperative respiratory assessment protocols.
- **Moderate Compliance:**
  Administration of beta blockers on post-operative day 1 was documented in 56.6% of cases. The remainder lacked documentation or were contraindicated, though the reasons were not always recorded in the medication administration record
- **Low Compliance:**
  Pathway documentation was fully completed in only 33.3% of files, revealing a significant documentation gap in the use of structured forms.
- **Rare but Well-Documented Events:**
  Re-exploration and re-intubation were rare, each occurring in only 1 case (1.89%). These events were documented adequately in the respective files.

4.6 Graphical Representation of Results

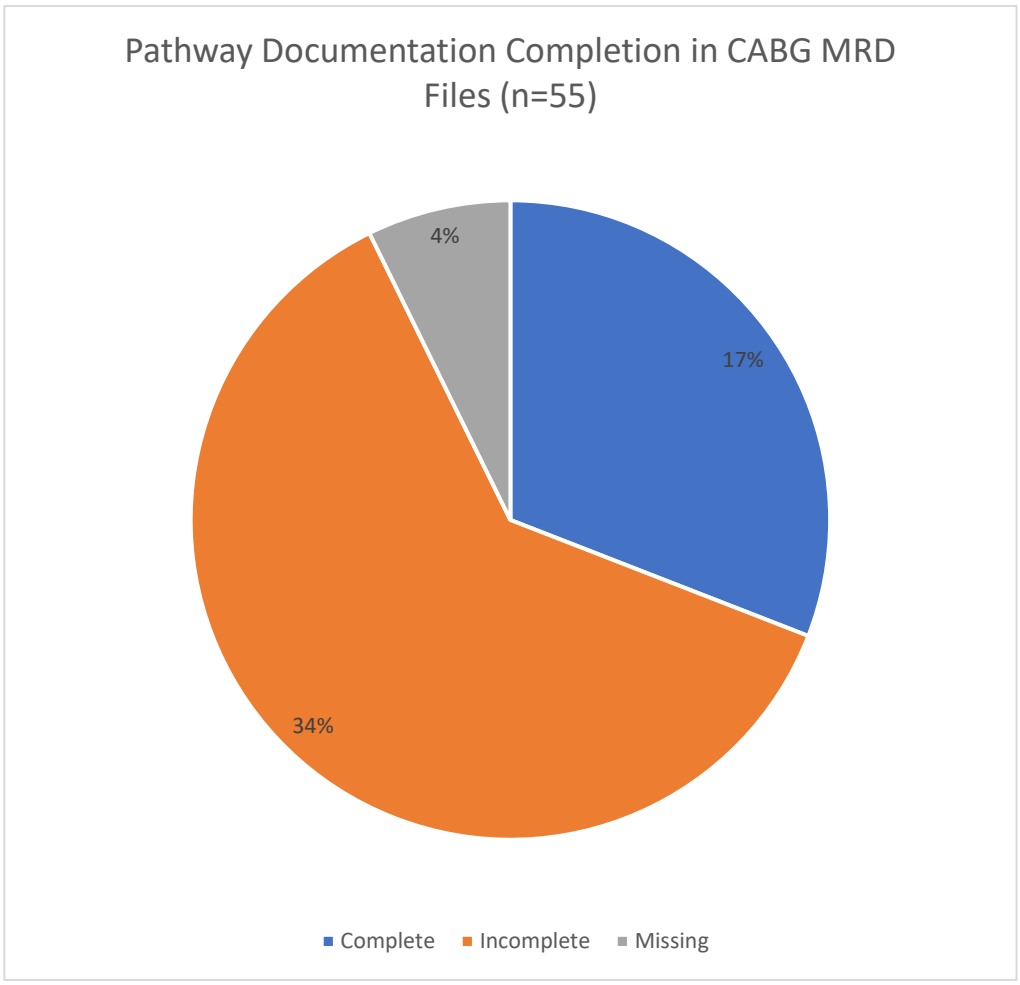

Figure 4.6.1 Pathway Documentation Completion in CABG MRD Files (n=55) Shows percentage of CABG MRD files with complete vs incomplete pathway documentation

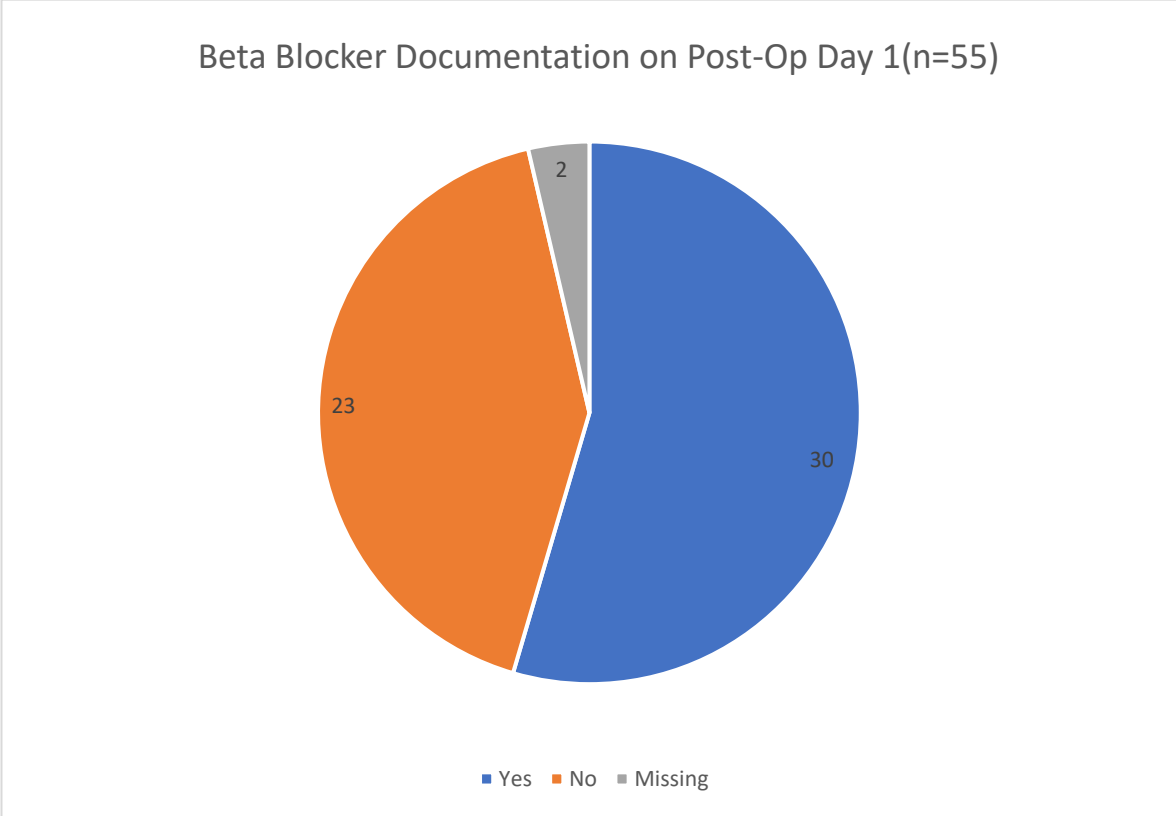

Figure 4.6.2 Beta Blocker Documentation on Post-Op Day 1 (n=55)

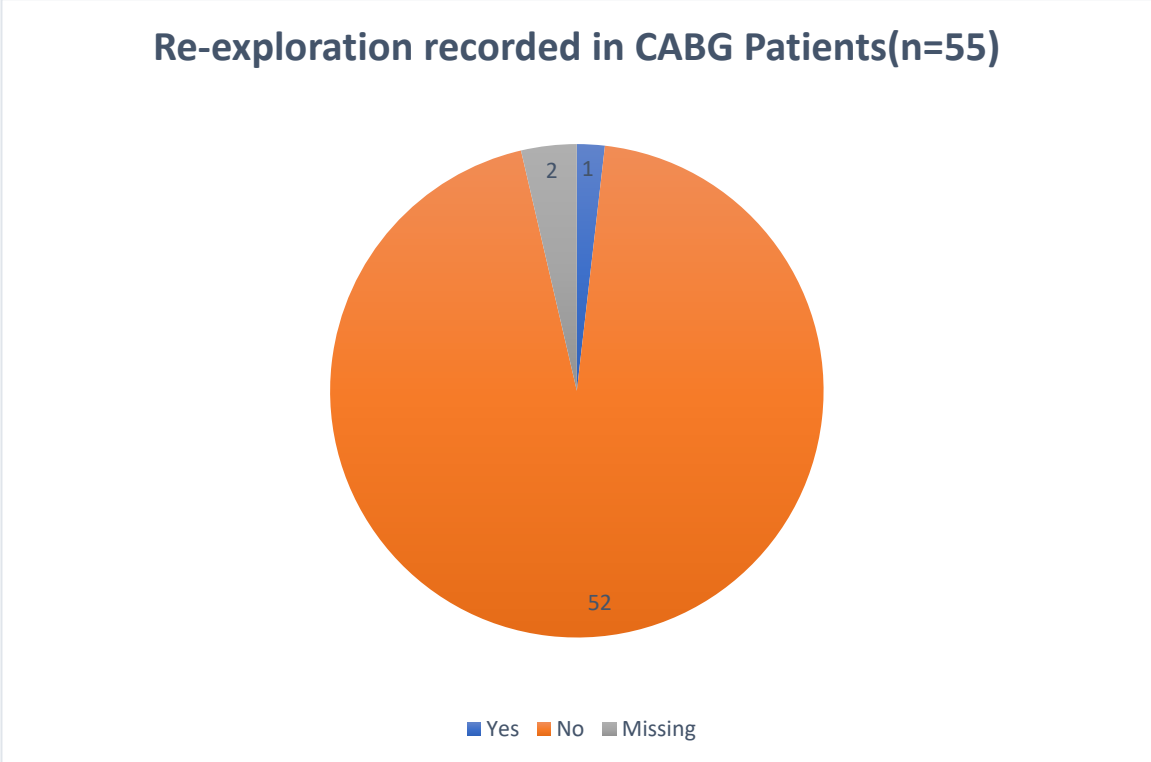

Figure 4.6.3 Re-exploration recorded in CABG Patients (n=55)

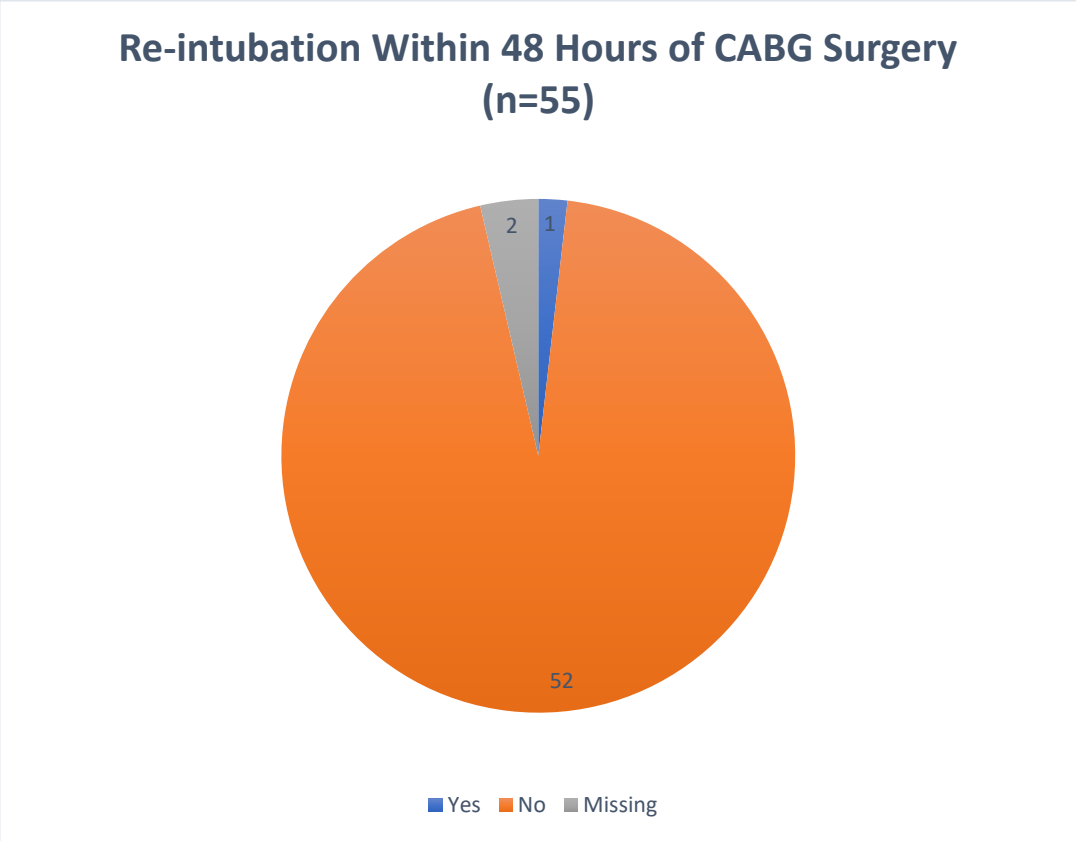

Figure 4.6.4 Re-intubation within 48 hours of CABG Surgery (n=55)

4.7 Overall Insights from the Audit

- Parameters tied to **departmental protocols (e.g., spirometry)** showed better compliance.
- Parameters requiring **manual entries into pathway forms** were poorly adhered to.
- There was **no formal intervention** during the study period, and this audit reflects routine documentation practices at the time.
- The variability in compliance suggests the need for **system-level changes**, such as EMR integration, training, and periodic audits.

CHAPTER 5:
DISCUSSION

This chapter interprets the results of the observational audit of CABG pathway documentation conducted at Medanta Hospital. The audit analyzed 55 MRD files of patients who underwent Coronary Artery Bypass Grafting in March 2025, assessing compliance with 15 clinical pathway parameters. The findings highlight areas of strength, gaps in documentation, and implications for hospital policy and patient safety.

5.1 Interpretation of Findings

The audit revealed considerable variation in the documentation of CABG clinical pathway parameters:

- **High Compliance** was observed in preoperative spirometry (100%), indicating that tasks managed by allied departments such as physiotherapy are consistently completed and documented, likely due to standard operating procedures.
- **Moderate Compliance** was noted in the documentation of beta blocker administration on postoperative day 1 (56.6%). This inconsistency could stem from a lack of awareness, variations in individual clinical judgment, or simply poor documentation of clinical decisions.
- **Low Compliance** was found in overall CABG pathway form completion (33.3%), suggesting a lack of integration between clinical care and documentation systems. Despite the form being available, its completion was often neglected, which may compromise the ability to monitor quality indicators.
- **Rare but Adequately Documented Events** such as re-exploration and re-intubation (1.89% each) suggest that serious complications are more likely to be documented accurately, possibly due to their medico-legal importance.

These findings suggest that clinical documentation is more consistently completed when it is protocol-driven, audit-sensitive, or directly tied to departmental workflows, and less so when it is considered an administrative task.

5.2 Comparison with Literature

The findings align with similar studies from India and abroad:

- Sharma et al. (2021) found only 38% completion of CABG pathway forms in a tertiary hospital, citing poor reinforcement and lack of audit culture.
- McDonald et al. (2018) reported that pathway compliance improved from 52% to 85% when integrated into electronic medical records (EMRs).
- Rao et al. (2019) observed that nursing documentation was more complete than physician documentation, a pattern mirrored in this study's consistent spirometry data vs. inconsistent post-op medication entries.

These comparisons validate the audit findings and support the need for system-wide documentation improvements, especially through digital integration.

5.3 Root Causes of Non-Compliance

Fishbone Diagram – Contributing Factors

1. People

- **Lack of Awareness:** Junior doctors and rotating residents are often unfamiliar with the documentation requirements of the CABG pathway.
- **High Turnover:** Frequent staff changes lead to inconsistent documentation practices.
- **Low Accountability:** No clear responsibility assigned for completing the pathway form.
- **Overburdened Staff:** Time constraints during night shifts or emergencies result in skipped documentation steps.

2. Process

- **Manual Paper-Based Workflow:** Dependency on physical forms increases risk of misplacement and human error.
- **No Closure Checklist:** MRD accepts files without verifying full completion of pathway documentation.
- **Non-integrated Systems:** EMR and pathway forms are not synchronized, leading to duplication or oversight.
- **Lack of Audit Trail:** No real-time notification system for incomplete forms.

3. Policy

- **Documentation Not Mandatory:** Pathway completion is not enforced as a prerequisite for discharge or file closure.
- **Weak Penalty Mechanism:** No escalation process or accountability loop for missed documentation.
- **Lack of Orientation:** New doctors/nurses not trained in pathway protocols during induction.

4. Place

- **Scattered Documentation Points:** Forms are not centrally located; often reside with the ward, nursing station, or MRD alternately.
- **Accessibility Issues:** During critical care shifts, access to documentation tools may be limited or deprioritized.

- **No Dedicated Form Filing Area:** Pathway forms get misplaced in voluminous files.

6. Environment

- **Emergency Situations:** Critical care context often shifts focus from documentation to urgent care.
- **Discharge Pressure:** Surgeons may rush documentation under pressure to discharge.
- **Night/Weekend Gaps:** Reduced supervision and staff availability affects form completion.

These root causes suggest that non-compliance is not due to negligence but due to structural workflow and system design flaws.

5.4 Practical Implications

- **For Patient Safety:** Incomplete documentation can delay interventions, hinder continuity of care, and increase the risk of adverse events.
- **For Hospital Administration:** Lack of pathway adherence weakens quality reporting, affects NABH/JCI accreditation metrics, and limits medico-legal defensibility.
- **For Policy Makers:** There is a strong need to digitally embed pathway tools and institute regular documentation audits at the departmental level.

5.5 Strengths and Limitations of the Study

Strengths:

- Focused audit on a specific high-risk surgical pathway in a high-volume tertiary care setting.
- Manual file review enhanced the accuracy of compliance measurements.
- Practical and policy-relevant findings.

Limitations:

- Small sample size (n=55), limited to one calendar month.
- Observational design, without an intervention component.
- Did not assess clinical outcomes, only documentation status.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study endeavored to determine the level of documentation as per the CABG clinical pathway at Medanta – The Medicity, Gurugram, through a retrospective audit of 55 MRD records of patients who underwent CABG in March 2025. The findings have verified acceptable practices and disturbing gaps that require immediate attention.

There was wide overall compliance with basic administrative and procedural documents such as name of surgery, date of admission and surgery, and discharge status, and pre-operative spirometry. There was also significant underperformance with direct measures of post-operative care and pathway form completion such as beta-blocker on POD 1 and critical alerts such as re-exploration and re-intubation.

Completed pathway forms existed for only 32.7%, a systemic deficit between protocol planning and actual practice. Incomplete or missing documentation eliminates the entire basis of clinical pathways—to deliver standardized, quality care and to allow retrospective analysis to facilitate ongoing quality improvement.

Root cause analysis identified several factors that contributed to it: lack of clearly defined ownership of documentation work, lack of digital integration, time pressures on critical care shifts, and lack of monitoring or reinforcement by leadership.

Though Medanta is placed top in the areas of infrastructure and clinical excellence, the research points out that documentation culture and system accountability need to be enhanced. Without complete and accurate records, hospitals compromise patient safety, miss quality standards, and deny the potential for learning from complications and outcomes.

6.2 Key Learnings from the Study

- Documentation compliance is not solely dependent on clinical competence but on **workflow design**, **system prompts**, and **organizational culture**.
- EMR integration, regular audits, and departmental ownership significantly improve adherence to clinical pathways.
- Even highly competent clinical teams may struggle with documentation unless prompted and supported by system-level changes.

6.3 Recommendations

Based on the findings, the following recommendations are proposed to enhance documentation compliance and optimize pathway adherence:

A. Clinical Process & Documentation Practices

1. **Enforce Pathway Usage Before MRD Closure:**
   Make completion of the CABG pathway form a checklist item for MRD file finalization.
2. **Introduce Mandatory Checkpoints:**
   Develop time-point reminders (e.g., on POD 1 for beta blocker initiation) for residents and nurses during daily rounds.

B. Training & Awareness

3. **Regular Sensitization Sessions:**
   Conduct mandatory training for interns, junior doctors, and nursing staff on pathway documentation protocols.
4. **Feedback Mechanism:**
   Share quarterly audit results with the cardiothoracic team and use data for quality improvement meetings.

C. Digital Integration

5. **Integrate Pathway into EMR System:**
   Digitize the CABG clinical pathway form within the hospital EMR to enable real-time documentation and auto-prompts.
6. **Enable Auto-Population of Routine Entries:**
   Reduce manual work by auto-filling common fields (e.g., pre-op tests, medication orders) based on clinical actions taken.

D. Quality Assurance & Monitoring

7. **Monthly Internal Audits:**
   Institutionalize routine audits of CABG files as part of hospital quality and patient safety protocols.
8. **Incorporate Compliance in Performance Dashboards:**
   Make pathway adherence a quality indicator for the cardiothoracic unit and link it to departmental KPIs.

6.4 Future Scope

Further studies may explore:

- The impact of digitized pathways on compliance rates and clinical outcomes.
- Multi-center audits to compare pathway adherence across hospitals.

- Interventional studies to assess the effect of targeted training on documentation behavior.

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