

AUDIT OF MEDICATION TRANSCRIPTION ERRORS IN INPATIENT WARDS AT CK BIRLA HOSPITAL, JAIPUR

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by

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Under the Supervision and Guidance of

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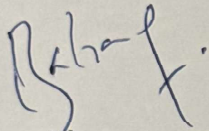
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TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Rajat Saini** has completed his internship in the Clinical Pharmacology Department from 11 March 2025 to 31 May 2025.

We wish him every success in his future and career.

For CK Birla Hospital – RBH



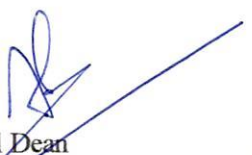
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CERTIFICATE

This is to certify that dissertation titled AUDIT OF MEDICATION TRANSCRIPTION ERRORS IN INPATIENT WARDS AT CK BIRLA HOSPITAL, JAIPUR is a record of the research work undertaken by RAJAT SAINI in partial fulfillment of the requirements for the award of the degree of MBA (Pharmaceutical Management) from the IIHMR University, Jaipur under my guidance and supervision and his approach to the research study has been sincere, scientific, and analytical.



Faculty Guide
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18/6/2025

DECLARATION BY STUDENT

I, **RAJAT SAINI**, Enrolment No. **IIHMR-U/02/2023-25/0553** Hereby Declare That This Dissertation Is Audit of Medication Transcription Errors in Inpatient Wards at CK Birla Hospital, Jaipur at CK BIRLA HOSPITAL, JAIPUR the Bonafide Record of My Original Research Work. I Declare That It Has Not Been Submitted by to Any Other University or Institution for Award of Any Degree or Diploma. Information Derived from The Published or Unpublished Work of Others Has Been Duly Acknowledged in the Text.



Name of the Student: RAJAT SAINI

Date: 18/june/2025

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ABSTRACT

Medication errors, especially those occurring during the transcription phase by healthcare professionals, are a serious concern in clinical practice and pose a direct risk to patient safety. These errors can lead to incorrect dosages, wrong medications, or missed treatments, potentially causing severe harm or even fatalities. Transcription errors often stem from illegible handwriting, omission of critical drug details, or the use of non-standard abbreviations.

Accurate and clear documentation is therefore vital to ensure that prescribed therapies are correctly interpreted and administered. Implementing standardized protocols and conducting regular audits can significantly reduce the incidence of such errors, ensuring better patient outcomes

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LIST OF ABBREVIATIONS

1. **Rx** – Prescription
2. **Dx** – Diagnosis
3. **Tx** – Treatment
4. **Hx** – History
5. **Sx** – Symptoms
6. **Pt** – Patient
7. **OD** – Once daily (can be confused with "right eye" in ophthalmology)
8. **BD** – Twice daily
9. **TDS** – Three times daily
10. **QID** – Four times daily
11. **PRN** – As needed
12. **IV** – Intravenous
13. **IM** – Intramuscular
14. **SC** – Subcutaneous
15. **mg** – Milligram
16. **ml** – Milliliter
17. **mcg** – Microgram
18. **IU** – International Units (unsafe due to misinterpretation)
19. **TAB** – Tablet
20. **CAP** – Capsule
21. **Susp** – Suspension
22. **AC** – Before meals
23. **PC** – After meals
24. **HS** – At bedtime
25. **STAT** – Immediately
26. **Q4H** – Every 4 hours

INTRODUCTION

Medication errors are among the most common preventable causes of harm to patients in healthcare settings. These errors can occur at any stage of the medication use process—prescribing, transcribing, dispensing, administering, or monitoring. Among these, transcription errors hold a significant share, especially in hospitals where handwritten medication charts are still in use. Transcription involves the accurate transfer of a medication order from one document to another, often carried out by prescribing doctors or authorized healthcare professionals. Mistakes at this stage may result from miscommunication, illegible handwriting, use of non-standard abbreviations, or omission of critical drug information such as dose, route, or frequency.

Transcription errors can have serious clinical consequences, including treatment delays, adverse drug reactions, or even life-threatening events. The complexity of inpatient care, particularly in intensive care units (ICUs) and high-dependency units (HDUs), increases the likelihood of such errors due to the high volume of prescriptions and the involvement of multiple healthcare providers. Ensuring accuracy in medication documentation is therefore essential for safe and effective patient care.

Auditing medication charts is an essential strategy to identify and quantify transcription-related errors. Regular audits not only provide insight into current prescribing practices but also help in pinpointing specific error patterns and areas of concern. These findings can then be used to implement targeted interventions such as prescriber training, adoption of electronic medical records (EMRs), and the establishment of standardized documentation protocols.

This study was conducted at CK Birla Hospital, Jaipur, under the Clinical Pharmacology Department, with the aim of evaluating transcription errors in inpatient medication charts. The audit covered prescriptions from January to April 2025 and was supervised by an experienced clinical pharmacologist. The findings of this project aim to support ongoing efforts to improve patient safety and promote rational prescribing practices in the hospital setting.

Review of Literature

Medication errors are a major concern in hospital settings, with significant implications for patient safety, treatment efficacy, and healthcare costs. This study, conducted at **CK Birla Hospital, Jaipur**, under the guidance of the Clinical Pharmacology Department, aimed to analyze the transcription-related medication errors committed by healthcare professionals, particularly doctors.

A total of **468 patient files** were audited across various ICUs, including MICU, SICU, CCU, and NICU. The study focused on transcription errors in medication charts, especially those prescribed by doctors.

Summary of Key Metrics

Metric	Value
Total No. of Errors	1,523
Total No. of Drugs Reviewed	3,878
Average Errors per Drug (%)	39.27%
Total No. of Patients	468
Average Errors per Patient	8.29
Average Error Rate per Chart	42.73%

Interpretation:

- Approximately **39.27%** of all drugs reviewed had transcription-related errors.

- On average, each patient’s medication chart contained about **8 transcription errors**, indicating a considerable risk to patient safety.

Types of Errors Identified

Type of Error	Examples from Data
Illegible Handwriting	Difficult-to-read prescriptions by doctors
Non-Usage of Capital Letters	Drug names not written in capital letters
Non-Usage of Generic Names	Brand names used instead of generics
Error-Prone Abbreviations	Use of “OD”, “IU” without clarification

Interpretation:

- Most errors stemmed from documentation practices such as poor handwriting and misuse of abbreviations.
- There is a need to enforce generic prescribing habits and standardized writing protocols.

Location-Wise Distribution

Location	Files Audited	Observations
MICU / HDU	30	High transcription error load
Neuro ICU	30	Similar trend of documentation issues
SICU + CTVS ICU	30	Medical cases: 55%, Surgical: 45%
CCU	30	Mixed pattern observed
NICU	50 (Quarterly)	Noted for unique pediatric concerns

Interpretation:

- Errors were observed across all ICUs, with no unit being entirely error-free.
- Medical units exhibited slightly higher documentation errors than surgical units.

Consultant-Wise Observations

The audit covered multiple consultants including Dr. Amrish Gupta, Dr. Sushil Kalra, and others. Each consultant's charts were analyzed for transcription consistency.

Interpretation:

- Variability exists between prescribers. Some consistently followed better prescribing practices, while others frequently used non-recommended abbreviations and brand names.

Sub-Categories of Errors (From “error sub type” Sheet)

Sub-category	Description
No/Wrong Dose	Dose not mentioned or incorrect
No/Wrong Frequency	Missing or incorrect frequency of dosage
No/Wrong Route	Route of administration not specified
Non-Usage of Generic Names	Brand names used instead of generic
Error-Prone Abbreviations Used	Unsafe abbreviations found in prescriptions

Interpretation:

- These subcategories highlight common clinical oversights.
- They underline the importance of structured audits and targeted interventions.

Overall Conclusion from Data

The audit reveals a significant burden of transcription errors, primarily due to non-standardized documentation practices by healthcare professionals. With an average of over 8 errors per patient and nearly 40% of drugs having associated errors, the study emphasizes the urgent need for:

- **Prescriber education and training**
- **Implementation of electronic prescribing systems (e-prescription)**
- **Regular internal audits and corrective action planning**

Patient and Data Overview

From the master audit sheet, a total of **1,523 transcription errors** were identified in **468 patient charts**. The cumulative number of drugs prescribed in these charts was **3,878**, which results in an approximate transcription error rate of **39.27%**. On average, each patient's chart contained around **8 transcription errors**, signalling a considerable risk in terms of potential adverse drug events and delays in treatment. This data reflects a concerning trend in manual documentation practices and points toward the urgent need for system-level interventions.

Error Categories

Transcription errors were categorized based on various criteria. The common types identified included:

1. **Illegible Handwriting:** One of the most persistent issues in manual prescription was poor handwriting, leading to confusion or misinterpretation of drug names and dosages.

2. **Non-Usage of Generic Names:** A large number of prescriptions were written using brand names rather than recommended International Nonproprietary Names (INNs). This not only adds financial burden but also increases the risk of drug confusion.
3. **Non-Capitalization of Drug Names:** Capital letters are essential in prescriptions to differentiate drug names clearly; however, many entries ignored this standard.
4. **Error-Prone Abbreviations:** Abbreviations like “OD” (once daily), “IU” (International Units), or “µg” (microgram) were used frequently, despite being on global lists of unsafe abbreviations.

These findings echo trends observed in broader literature, where documentation errors, especially transcription-related, have been flagged as major contributors to preventable harm in healthcare.

Sub-Categories and Specific Trends

The most frequent **sub-category** of transcription error was the **omission or incorrect mention of the drug dose**, followed by **missing or inaccurate frequency** and **unspecified routes of administration**. These elements are crucial to safe medication administration, and their omission can lead to underdosing, overdosing, or misuse of medication delivery methods.

The next major sub-category was **non-usage of generic names**. Despite regulatory recommendations from the Medical Council of India (MCI) and WHO for writing prescriptions in generic form, many consultants preferred brand names. This practice, while sometimes commercially driven, is clinically risky and financially burdensome for patients.

Furthermore, many prescriptions included **error-prone abbreviations**, which could easily be misread by nurses or pharmacists. The use of such shorthand, although time-saving, has been consistently discouraged in modern clinical practice due to its ambiguity.

Consultant-Wise and Departmental Trends

The audit also included a consultant-wise breakdown of prescriptions, analyzing documentation styles and consistency among different prescribers. Variations were observed in terms of adherence to standard prescribing norms. Some consultants showed commendable consistency and clarity in prescriptions, while others frequently used non-recommended abbreviations or omitted vital details such as dosage and frequency.

Each ICU also presented its own patterns:

- **MICU and HDU:** These units saw high medication load and frequent transcription issues, often due to multiple changes in therapy plans.
- **Neuro ICU:** Errors were relatively frequent in neurology prescriptions, especially involving anticonvulsants and antipsychotics, where dosage precision is critical.
- **SICU and CTVS ICU:** Though surgical units had slightly fewer errors, many mistakes involved continuation of postoperative medications or missing start/stop dates.
- **CCU (Cardiac Care Unit):** Prescriptions often included complex cardiac regimens, making documentation errors particularly risky.
- **NICU:** Pediatric errors were found in terms of weight-based dosing miscalculations and missing concentrations, highlighting the unique sensitivity required in neonatal care.

Interpretation and Implications

The presence of 1,523 transcription errors in just four months, across fewer than 500 patients, is a strong indicator that the current manual system of prescription writing is insufficient in ensuring medication safety. The use of brand names, non-standard abbreviations, and omission of essential drug details reflects a lack of uniformity and potentially limited awareness about best practices among prescribers.

These results support a larger narrative observed across the Indian healthcare system and globally. When medical errors occur due to transcription issues, they not only affect patient safety but also erode trust in the healthcare system. Studies have shown that nearly 60% of medication errors are preventable, and transcription remains a common node where errors originate and propagate.

Recommendations

Based on the findings of this audit, several interventions are recommended:

- **Prescriber Education:** Workshops or training sessions should be conducted to familiarize doctors with the importance of generic names, avoidance of abbreviations, and adherence to safe writing practices.
- **Standardized Prescription Templates:** Implementing standardized medication charts that require mandatory fields (dose, frequency, route, duration) could reduce omissions.
- **Electronic Medical Records (EMR):** Gradual adoption of EMRs with built-in prescription modules can eliminate issues related to illegible handwriting and enable auto-checks for dosage ranges, drug interactions, and frequency.
- **Pharmacist Involvement:** Including clinical pharmacists in routine prescription audits and medication reconciliation processes would add an extra layer of safety.
- **Periodic Audits and Feedback:** Monthly or quarterly audits should be continued and reviewed by the clinical pharmacology team, with individual feedback provided to departments and consultants.

This medication error audit highlights the prevalence and gravity of transcription errors in a tertiary hospital setup. The findings emphasize the urgent need for institutional reforms, standardization, and enhanced accountability in prescription practices. While the clinical pharmacology department plays a critical role in identifying and correcting these patterns, the long-term solution lies in system-wide adoption of electronic tools, prescriber sensitization, and

multidisciplinary collaboration. Ensuring safe, accurate, and legible prescriptions is not just a procedural responsibility but a moral imperative toward safeguarding patient lives

RESEARCH METHODOLOGY

Research Question:

1. How can audit data be used to develop standardized prescribing protocols for improved patient safety?
2. What role do prescriber education and training play in mitigating transcription errors?
3. How does the implementation of electronic medical records (EMR) affect transcription accuracy?
4. How do prescriber documentation habits impact the frequency of transcription errors?

1. Objective:

- **Evaluate the Prevalence** – Identify the frequency and distribution of transcription errors across different inpatient/outpatient departments.
- **Assess Error Types** – Categorize and analyze common transcription errors, including illegible handwriting, improper abbreviations, incorrect dosages, and omission of essential drug details.
- **Identify Contributing Factors** – Investigate potential causes behind these errors, such as prescriber habits, documentation practices, and workflow inefficiencies.
- **Analyze Impact on Patient Safety** – Evaluate how transcription errors influence treatment delays, adverse drug events, and overall healthcare quality.
- **Compare Error Rates Across Units** – Determine whether certain hospital departments exhibit higher transcription error rates than others.
- **Evaluate the Role of Prescriber Training** – Assess whether prescriber awareness, education, or standardization efforts can help reduce errors.
- **Explore the Implementation of EMRs** – Investigate how electronic medical records (EMRs) or digital prescribing tools can mitigate transcription errors.
- **Develop Recommendations** – Propose corrective actions, policy changes, and workflow improvements to enhance medication safety and accuracy.

2. Hypothesis:

This study employs quantitative audits, qualitative assessments, and statistical analysis to identify medication transcription error patterns in inpatient wards at CK Birla Hospital, Jaipur. By evaluating contributing factors and intervention strategies, it aims to enhance prescribing accuracy, reduce errors, and improve patient safety through prescriber training, EMR implementation, and standardized documentation protocols.

3. Material and Methods:

Study Design

This research follows a retrospective audit-based observational study, analysing medication transcription errors in inpatient wards at CK Birla Hospital, Jaipur. The study utilizes both quantitative and qualitative methodologies to assess error prevalence, types, and contributing factors.

Study Setting and Duration

- Location: CK Birla Hospital, Jaipur
- Departments Covered: MICU, SICU, CCU, NICU, and HDUs
- Time Frame: January to April 2025

4. Data Collection Methods

1. Retrospective Chart Audit

- Medication charts of 468 patients were reviewed.
- Transcription errors were identified and classified based on predefined categories.
- Data from handwritten and electronic prescriptions were compared.

2. Error Classification and Analysis

- Errors were grouped into illegible handwriting, incorrect dosage, non-standard abbreviations, and omission of drug details.
- Statistical measures such as error rates per drug and per patient were calculated.

3. Qualitative Assessment

- Structured interviews with doctors, nurses, and pharmacists.
- Observations of documentation workflows and prescribing behaviors.

4. Data Analysis

- Descriptive Statistics: Frequency distribution of errors.
- Inferential Statistics: Correlation between error rates and prescriber practices.
- Comparative Analysis: Handwritten vs. Electronic prescriptions error trends.

5. Operational Definitions:

Medication transcription errors occur when incorrect drug information—such as name, dose, route, or frequency—is transferred from one document to another. Prescribers, including doctors and clinical pharmacologists, are responsible for writing medication orders, which can be either handwritten or recorded in electronic medical records (EMRs). Handwritten prescriptions are more error-prone due to illegible writing and ambiguous abbreviations, necessitating systematic audits to identify and address these issues. The error rate quantifies transcription inaccuracies, particularly in high-dependency units (HDUs). Prescriber training and standardized documentation protocols are essential for reducing errors and preventing adverse drug events (ADEs), which may impact patient safety and treatment effectiveness.

6. Ethical Consideration:

Ensure that all participants have given their information consent are aware of the purpose of the study as well as their right to withdraw at any time. By using codes to identify the participants' responses rather than personally identifiable information, you can guarantee

their confidentiality and anonymity. An ethics committee will examine and approve the study to guarantee that research ethics are followed.

RESULT AND DISCUSSION

Results

The audit of medication transcription errors at CK Birla Hospital, Jaipur, revealed significant documentation inconsistencies. Key findings include:

- **Total Errors Identified: 1,523 errors across 468 patient charts.**
- **Error Rate: 39.27%** of prescribed drugs contained transcription-related mistakes.
- **Most Common Errors:** Illegible handwriting, misuse of abbreviations, incorrect dosages, and omission of essential drug details.
- **ICU-Specific Trends:** High-dependency units showed higher error rates due to complex medication regimens.
- **Impact on Patient Safety:** Increased risk of treatment delays, adverse drug events (ADEs), and compromised therapeutic effectiveness.

Conclusion

The study underscores the urgent need to enhance medication transcription accuracy through prescriber education, standardized documentation protocols, and electronic medical record (EMR) implementation. Addressing these errors is critical for improving patient safety and optimizing hospital workflow efficiency. Future interventions should focus on digital prescription systems, regular audits, and clinician training programs to minimize transcription mistakes and ensure reliable medication practices.

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