ANALYSING MEDICATION ERRORS AND RELATED ADVERSE EVENTS IN AN ONCOLOGY TERTIARY CARE HOSPITAL

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INTRODUCTION

- **Medication Management** is the standard of care that ensures each patient's medications are individually assessed to determine that each medication is appropriate for the patient, effective for the medical condition, safe given the comorbidities and other medications being taken, and able to be taken by the patient as intended.
- A medication error is defined as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer," (FDA, National Coordinating Council for Medication Error Reporting and Prevention). Medication errors can occur throughout the medication-use system. Such as, when prescribing a drug, upon entering information into a computer system, when the drug is being prepared or dispensed, or when the drug is given to or taken by a patient.
- Serious harmful results of a medication error may include:
- • Death • Life threatening situation • Hospitalization • Disability • Birth defect

METHODOLOGY

Research Intent:

- Classification of medication errors reported and audited in the center
- Analysis of the root causes of the errors
- Analysis of the outcome severity and effects on the patients (morbidity and cost)

- **Study design:** Observing and Retrospective data analysis of error registry.
- **Settings:** The study and research work conducted in Quality Assurance Department, in inpatient wards, day care, outpatient clinics and in pharmacy department.
- **Study population:** Patients getting treatment at Tata Medical Center
- **Study tools:** Medication error registry, audit checklists, adverse drug reaction registry
- **Duration of Study:** 3 months
- **Sample size:** Retrospective data analysis of error registry of March 2022 – June 2022
- **Data collection procedure:** Retrospective secondary data
- **Data Analysis Plan:** Data analysis will be done using Microsoft excel

Medication Error Rate

Prospective audit by Clinical Pharmacology and D Pharm teams

Reported administration and other errors through the adverse event registry

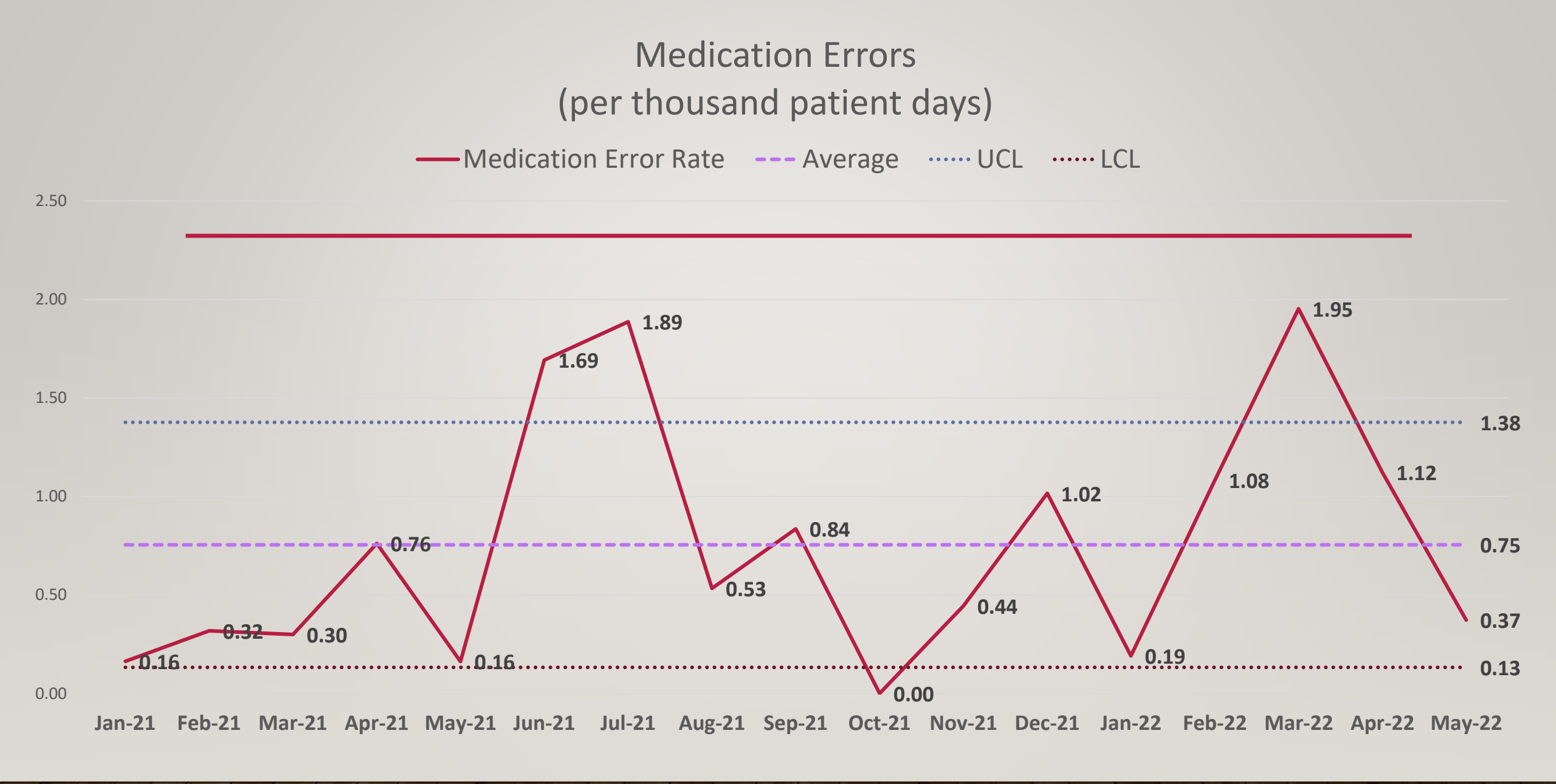
Auditors: Clinical Pharmacology

Standardized checklist , online

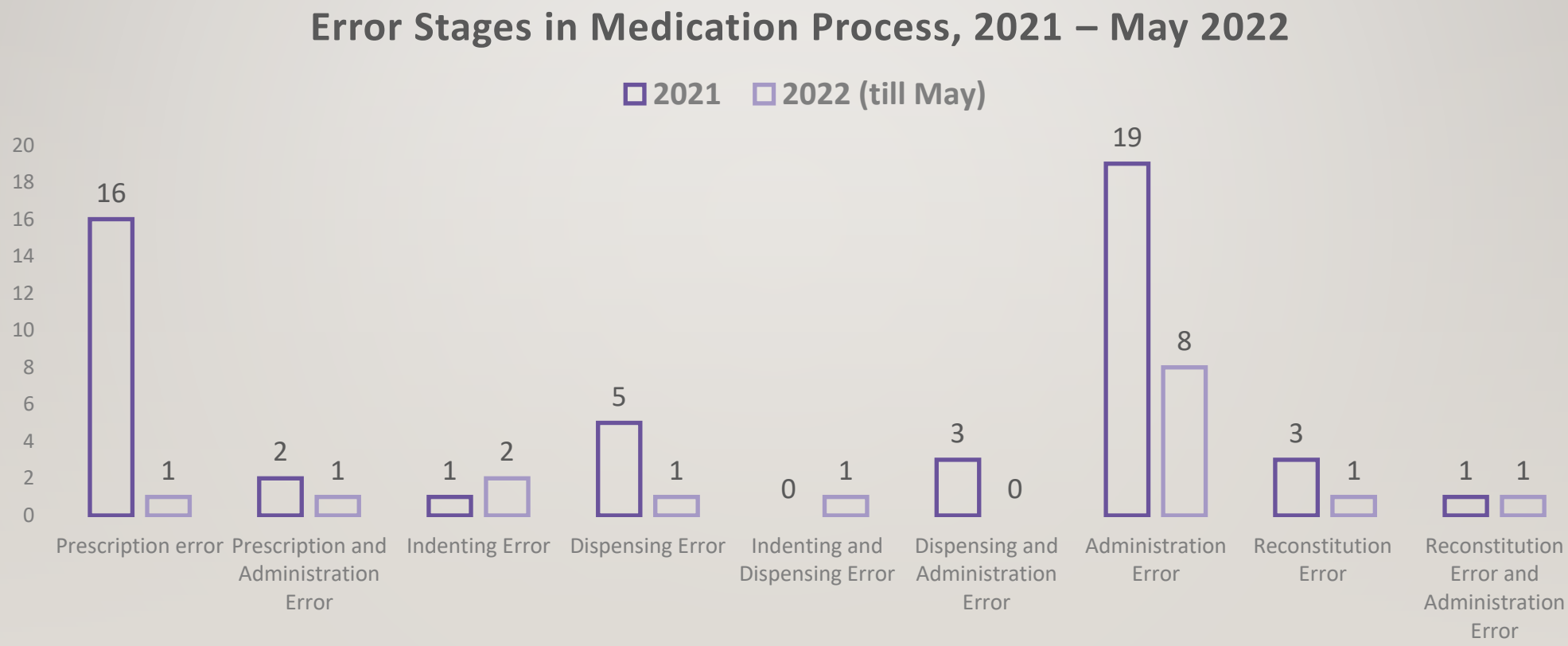
Data Verification: QA auditors' audit on smaller retrospective sample size, data correlated monthly, deviations discussed for root cause

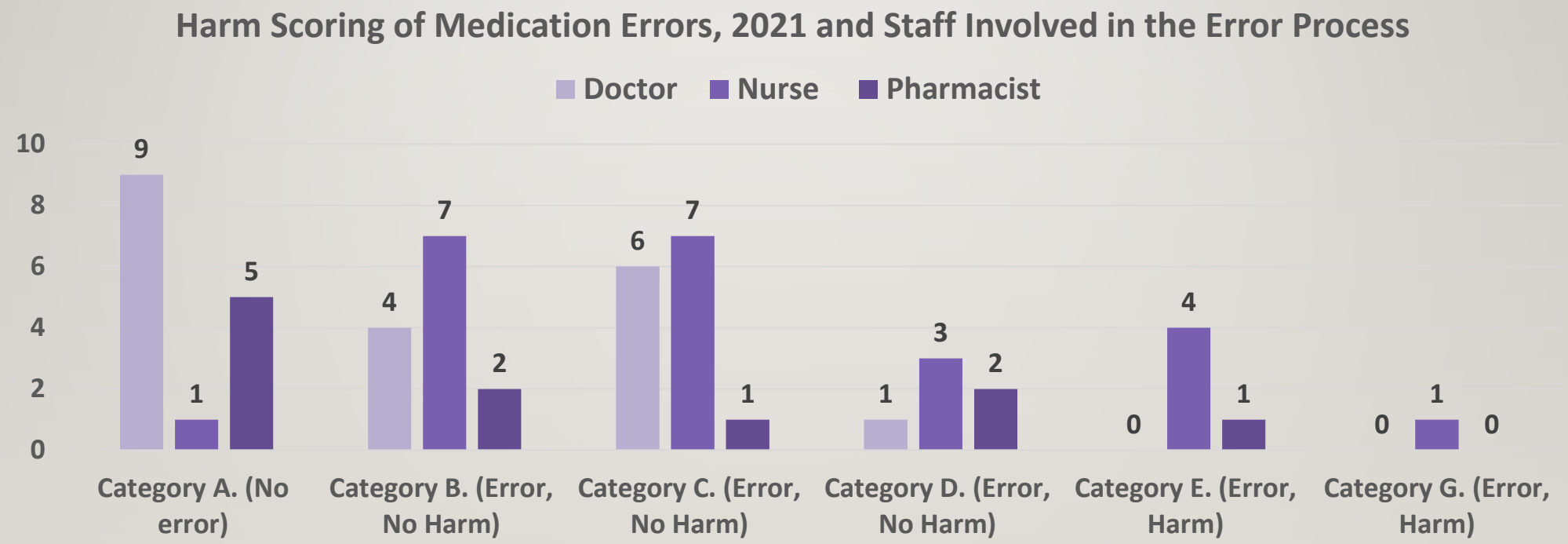
Denominator: TMC uses patient days as the denominator

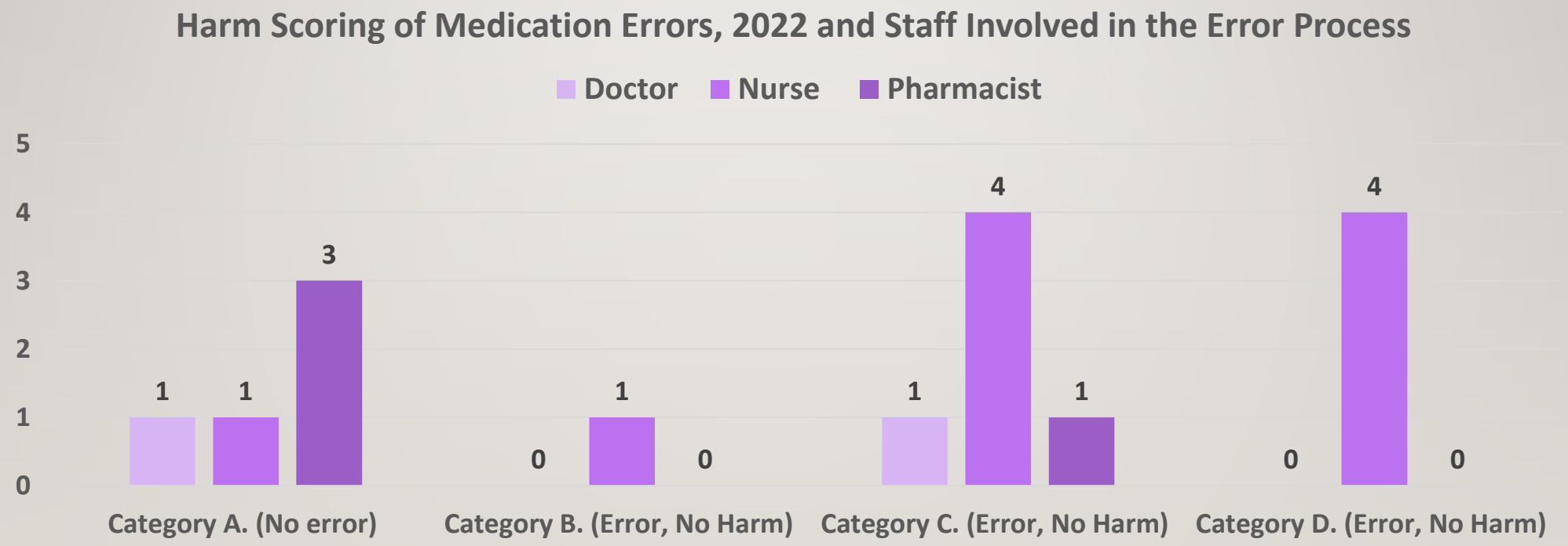
Medication Errors
(per thousand patient days)



Error Stages and Harm Score




Harm Scoring of Medication Errors, 2021 and Staff Involved in the Error Process
Doctor
Nurse
Pharmacist
10
8
6
4
2
0
9
1
5
4
7
2
6
7
1
1
3
2
0
4
1
0
1
0
Category A. (No error)
Category B. (Error, No Harm)
Category C. (Error, No Harm)
Category D. (Error, No Harm)
Category E. (Error, Harm)
Category G. (Error, Harm)


Harm Scoring of Medication Errors, 2022 and Staff Involved in the Error Process
Doctor
Nurse
Pharmacist
5
4
3
2
1
0
1
1
3
0
1
0
1
4
1
0
4
0
Category A. (No error)
Category B. (Error, No Harm)
Category C. (Error, No Harm)
Category D. (Error, No Harm)

MOST FREQUENT ROOT CAUSES OF MEDICATION ERRORS

- Cut strip medications stored separated from the same lot with the same batch number.

  (IPSG Audit report, May-July, 2021)
- Look Alike drugs stored in same place with different strengths (IPSG Audit report, May-July, 2021)
- Absence of labelling of the High Alert Drugs with High Alert stickers (IPSG Audit report, May-July, 2021)
- Patient is not prescribed right drug (Adverse Incident dated 07-02-2020 & 14-07-2021)
- Patient is not prescribed the correct dose (Adverse Incident dated 20-03-2020)

CORRECTIVE ACTIONS AND INTERVENTIONS

Corrective Actions:

- Prescription errors are corrected on the spot by the team of auditors from Medical Records and Pharmacology departments by discussing with the ordering clinicians.
- Administration errors are immediately addressed with necessary clinical interventions and an adverse event report is completed for further analysis of root causes.

Preventive Actions:

- A Failure Mode Effects Analysis was conducted to assign risks to each step of the medication management process and determine its impact.
- All reported medication errors are analysed by the Medication Management team consisting of Nurses, D Pharms, Clinical Pharmacologists and Quality Assurance.
- Errors types are coded with a harm score and analysed for their impact as well as root causes.
- This analysis is shared with stakeholders and discussed in Hospital Drug and Therapeutic Committee meetings.
- Periodic training, mandatory induction training, preceptorship training is organized on this topic.

THE FOLLOWING PROCESSES IN THE MEDICATION MANAGEMENT SYSTEM WERE IDENTIFIED AS HIGH AND VERY HIGH RISK BASED ON THE FMEA

- **Patient consent for high risk drugs:** The Apollo Pharmacy is implementing a consent form to be signed by all patients after being counseled on all high-risk drugs (side effects, dose and frequency and adverse effects if misused) before being dispensed for home use.
- **Prescription Policy training for all doctors:** The focus of training imparted to doctors in 2021 has been on Medication Safety, prescription writing and patient counseling on medication safety.
- **International Patient Safety Goal training emphasizing on Drug Safety:** Mandatory training for all staff were taken in 2020, 2021 on International Patient Safety Goals, with focus on Medication Safety. Data on TMC's adverse incidents were presented with root causes during these training for developing staff awareness and understanding.
- **Two nurses signing upon administration:** There is a control devised in the process of medicine administration where two nurses sign during administration of medicines. The role of the second nurse primarily is to check the drug, dose, route, reconstitution and frequency.
- **Storage of LASA and High-Risk drugs:** Regular drug storage rounds were implemented from early 2021 with emphasis on storage safety.
- The hospital is in the process of implementing a policy where cut strips of high-risk drugs and antibiotics will not be dispensed by pharmacy
- **Prescription audit sample size optimized with dedicated auditors and online audit methodology**: There are dedicated Pharmacology staff who conducts daily prescription and medication safety and usage audit in wards. This is done by using an online checklist and data is analyzed on a monthly basis.

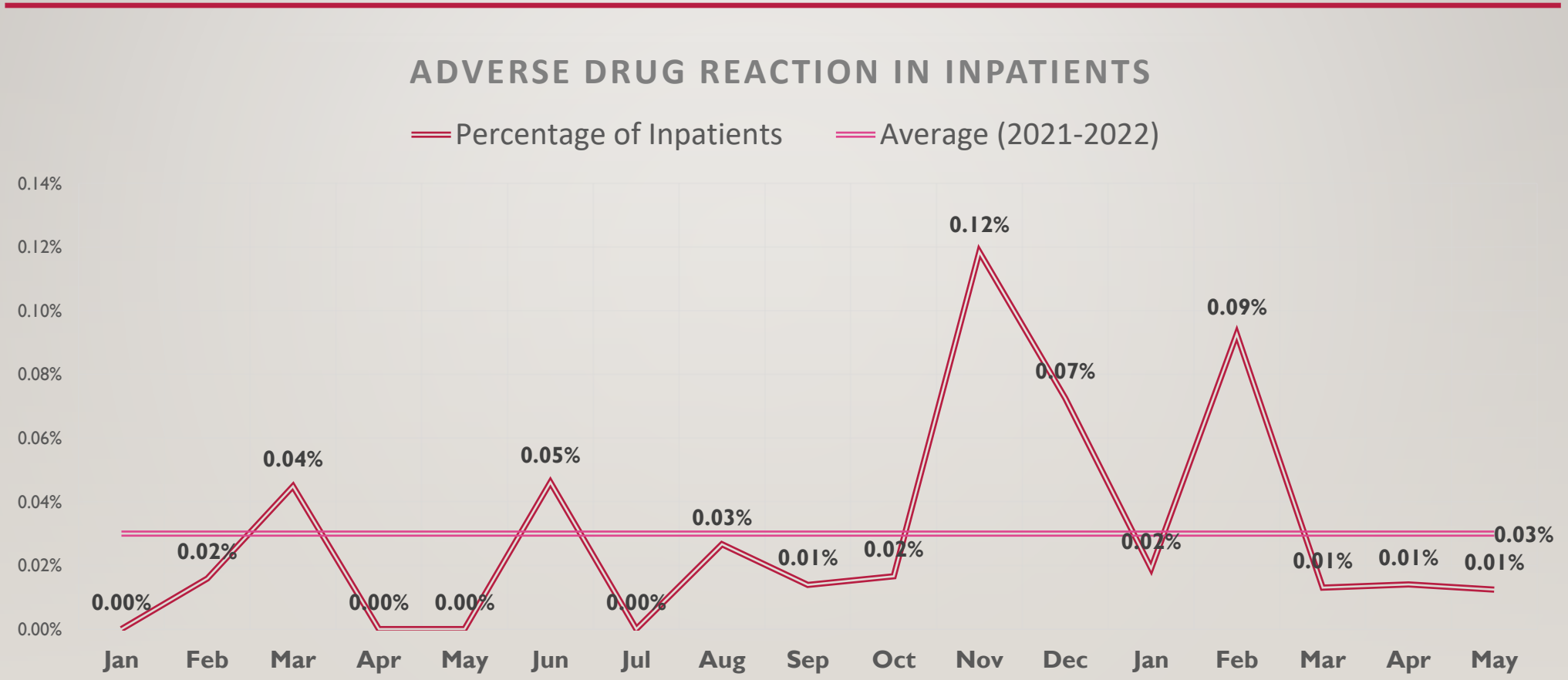
Adverse Drug Reactions

Centralized reporting system for ADR. All forms are routed to Clinical Pharmacologist and thereafter microbiology, pharmacy as applicable.

Auditors: Prospective reporting of data

Standardized format, paper form

Data Verification: QA auditors' tally total number of ADRs reported through the form and total reported as QI monthly, discrepancies discussed


ADVERSE DRUG REACTION IN INPATIENTS
Percentage of Inpatients
Average (2021-2022)
0.14%
0.12%
0.10%
0.08%
0.06%
0.04%
0.02%
0.00%
0.00%
0.02%
0.04%
0.00%
0.00%
0.05%
0.00%
0.03%
0.01%
0.02%
0.12%
0.07%
0.02%
0.09%
0.01%
0.01%
0.01%
0.03%
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May

Participation in National Pharmacovigilance Reporting Systems made robust

Corrective Actions:

- Each case, based on severity, is routed to clinical pharmacology and microbiology/infection control team for determining root causes and potential contamination causes if any.
- Necessary drug recalls are being done on immediate basis.

Preventive Actions:

- The hospital participates in the national pharmaco-vigilance program from Dec 2021
- Drug safety practices are regularly audited by a multidisciplinary team consisting of pharmacologists, pharmacists, nurses and quality control professionals. Audit are recorded and disseminated.
- The Drug and Therapeutic Committee oversees the compliances and strategize on actions to be taken to improve the same

REFERENCES

- Research study from google scholar, NABH Medication Management chapter and references, hospital policy etc.

- **Improving drug safety in hospitals: a retrospective study on the potential of adverse drug events coded in routine data;** Research article 19: Published: 08 August 2019: BMC Health Services Research.

- Targeted medication safety best practices for hospitals based on ISMP National Medication errors reporting forms.

- Creating a Pediatric Joint Council to Promote Patient Safety and Quality, Governance, and Accountability Across Johns Hopkins Medicine: Published: March 28, 2017 0.1186/1472-6963-12-60

Thank You