



World Quality Month 2020 Celebration

Cost saving Medication Therapy Management in Healthcare Organization



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INTRODUCTION

- ❖ 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.
- ❖ Medication errors are associated with significant amount of additional cost even without patient harm.
- ❖ Considering the substantial cost associated with medication errors, identification and reduction of errors should be further emphasized and promoted.
- ❖ Pharmacoeconomics should be a priority .

Medication costs comprise the majority of health system budgets and continue to increase faster than other health care expenditures.

Avoidable direct cost to Inpatients and Outpatients were identified as drug related problems in various domains in this study using a team of Clinical Pharmacists in different specialities.

PROBLEM DIAGNOSIS

Prospective interventional study in a Quaternary care multi-specialty hospital in India.

Study conducted in inpatients for a period from December 2018 to November 2019 and in outpatients for a period of from August 2017 to June 2018.

It was observed during the study period that some category of errors are having monetary benefits to the patients by avoiding those inappropriate drugs from the prescription.

If the prescriber accepted the intervention and modified the prescription, it was considered as a prescription with drug related problem and the cost saved for each such medications was documented under the respective medication error category.

PROBLEM DIAGNOSIS (Continued..)

Unit dose cost (cost of a tablet or vial) was taken for inappropriate drugs prescribed to be administered during hospital stay and anticipated cost (for prescribed course of treatment if continued) was taken for inappropriate drugs included in discharge summary.

Both unit cost and anticipated cost was calculated for outpatient prescriptions.

In Patient Cost Effective Interventions

Among **27,547** In-Patients admitted during the study period, **6,210** drug-related problems were prevented, out of which **778** were reported as cost-effective interventions which account for **12.5%** (Table: 1). Reported errors were categorized according to APS-Doc classification (Table: 2)

Out Patient Cost Effective Interventions

A total of **20,281** outpatient prescriptions were reviewed in this study. During this period **310** medication errors were reported and prevented, out of which **112 (36.1%)** were found to be cost saving for patients (Table 3). Reported errors were categorized according to PCNE classification (Table :4).

Table 1: Cost Saving Achieved In In-patients.

Sl.no	Cost saved DRPs	Number of data (%)	Sum cost (%)
1	Drug	523 (66.8%)	1,39,080 (18.2%)
2	Dosage form	179 (22.89%)	6,14,025 (80.6%)
3	Indication	59 (7.5%)	566 (0.074%)
4	Contraindications	13 (1.6%)	4,758 (0.62%)
5	Drug Interactions	5 (0.63%)	2,105 (0.27%)
6	Adverse Drug Reactions	3 (0.38%)	1,036 (0.13%)
	TOTAL	782	7,61,570 INR

PROBLEM DIAGNOSIS (Continued..)

Table 2- Classification system of drug-related problems in the hospital setting (APS-Doc)- Main Domains

- Drug
- Dosage form / drug strength
- Dosage
- Indication
- Contraindication
- Drug-drug Interaction
- Adverse drug reaction
- Administration / compliance
- Application
- Other

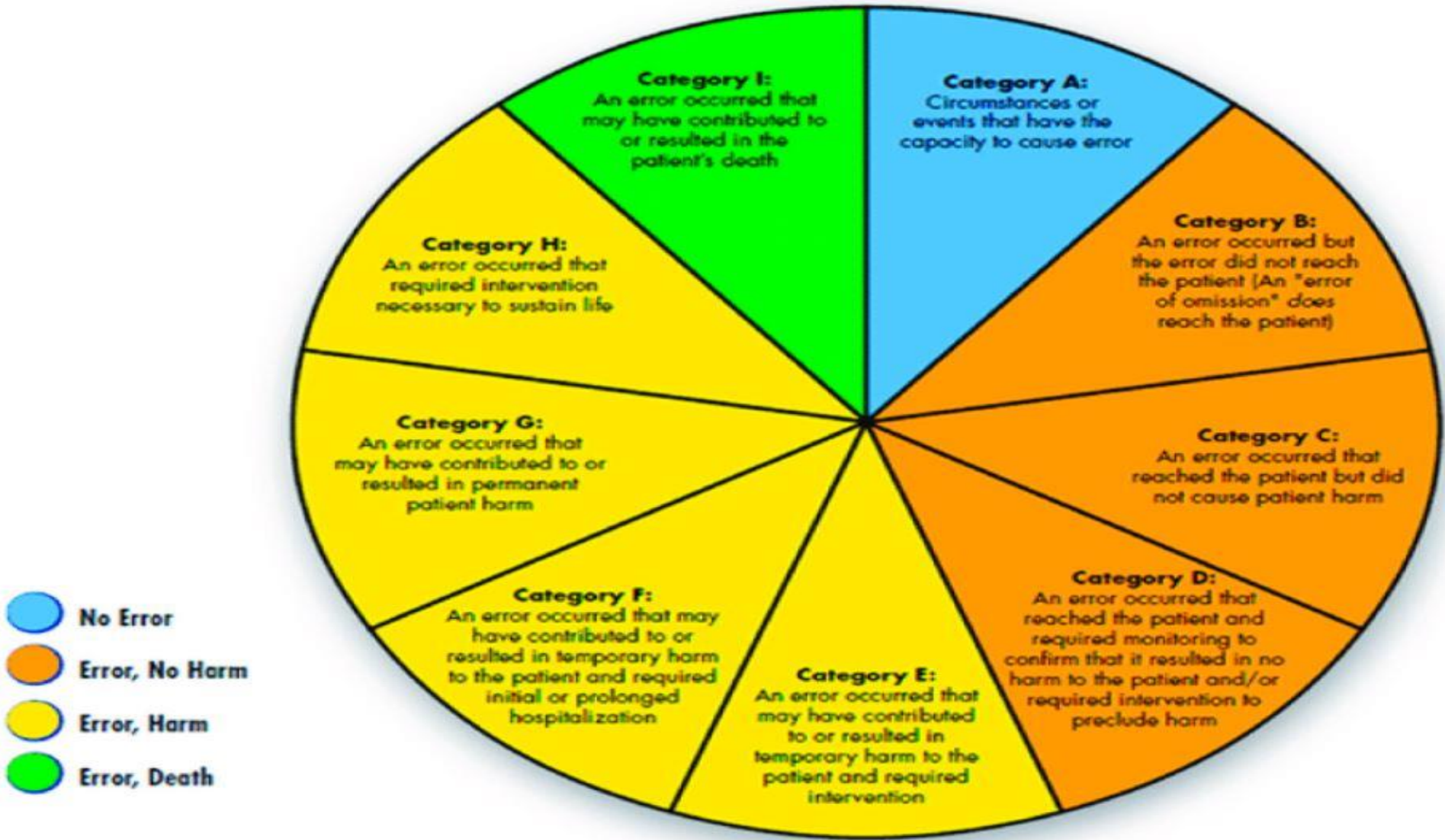
Table 3- Cost saving in outpatient prescription errors

Primary Domain	Causes (%)	UNIT DOSE COST SAVED (INR)	ANTICIPATED DOSE COST SAVED (INR)
Drug Selection	C1.2 (1.8%)	54.26	401.2
	C1.3 (3.5%)	1503.14	2404.39
	C1.4 (25.7%)	583.81	3694.78
	C1.5 (43.4%)	1313.94	14117.87
Dose Selection	C3.1 (0.9%)	1075	1075
	C3.2 (12.4%)	162.4	2764.17
	C3.4 (8.8%)	134.89	2028.27
	C3.5 (0.9%)	23.63	94.52
Treatment Duration	C4.1 (0%)	0	0
	C4.2 (1.8%)	24.66	310.6

Table 4- PCNE Classification scheme for Drug-Related Problems – Primary Domains

1. Drug selection: The cause of the (potential) DRP is related to the selection of the drug
2. Drug form: The cause of the DRP is related to the selection of the drug form
3. Dose selection: The cause of the DRP is related to the selection of the dose or dosage
4. Treatment duration: The cause of the DRP is related to the duration of treatment
5. Dispensing: The cause of the DRP is related to the logistics of the prescribing and dispensing process
6. Drug use process: The cause of the DRP is related to the way the patient gets the drug administered by a health professional or carer, despite proper dosage instructions (on the label)
7. Patient related: The cause of the DRP is related to the patient and his behaviour (intentional or non-intentional)
8. Others

NCC MERP Index for Categorizing Medication Errors



Definitions

Harm
Impairment of the physical, emotional, or psychological function or structure of the body and/or pain resulting therefrom.

Monitoring
To observe or record relevant physiological or psychological signs.

Intervention
May include change in therapy or active medical/surgical treatment.

Intervention Necessary to Sustain Life
Includes cardiovascular and respiratory support (e.g., CPR, defibrillation, intubation, etc.)

Remedial measures taken to reduce the economic burden on patients includes

- Implementation of Clinical Pharmacist driven **Prescription Drug Monitoring Program (PDMP)**: Clinical pharmacist was assigned to various clinical departments to monitor the drug related problems and communicate with healthcare professionals regarding the avoidable cost associated with applicable interventions. This Process also eliminates the cost of DRPs associated with patients home medications.

PROBLEM REMEDY

- Implementation of **Electronic Prescription Audit Tool with Automated Drug Error Message Alert System for monitoring outpatient electronic prescriptions**: This will allow transmission of prescription details from CPOE (Computerized physician order entry) to the Electronic Prescription audit tool on real time. Drug and Allergy interaction database was integrated into audit tool for alerting the auditor. Significant prescription errors were alerted to respective prescriber through message which is triggered automatically upon electronic documentation of errors against each drugs in a prescription.

PROBLEM REMEDY

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Dietary Management













Prescription Auditing

Master

Auditing

Drug Formulary

Punching Details

Patients						
Search...		<input checked="" type="radio"/> OP <input type="radio"/> IP		Export		
300386215	Safreequa Nasar	38 Yrs	Soumya John	11/27/2020	Carbuncle back	 
300386212	Salih T S	17 Yrs	Anuradha KakkanattBabu	11/27/2020	Tinea cruris , Corporis ?Atopy	 
300386212	Salih T S	17 Yrs	Anuradha KakkanattBabu	11/27/2020	Tinea cruris , Corporis ?Atopy	 
300386210	Simi Nejin	33 Yrs	Praveen Valsalan	11/27/2020		 
300386210	Simi Nejin	33 Yrs	Praveen Valsalan	11/27/2020		 
300386207	Silja KG	37 Yrs	Mayadevi KurupS	11/27/2020		 


Reviewed : 512 UnReviewed : 349

Total no of drugs : 861

PROBLEM REMEDY (Continued...)

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Automated Pop up Alerts: Hospital Information system was integrated with pop up alerts at the prescription level itself to avoid the prescription of allergic drugs and prescription of drugs which exceeds maximum daily dose.



By Changing the once daily default frequency, prescribed dose of Domperidone will exceed the maximum daily dose(30 mg/day) Do you want to proceed ?

OK

Cancel



Concomitant prescription of Tab BENADON (PYRIDOXINE) is recommended to avoid the risk of Isoniazid induced Peripheral Neuropathy

OK

Cancel

- **Electronic discharge summary review process** : To avoid DRPs associated with discharge summaries of Inpatients, electronic cross review of each summary by the clinical pharmacist and errors will be communicated and rectified before discharge medications were dispensed from pharmacy.

- **Mandatory documentation of valid period**: Drug categories which are found to be treated with extended treatment duration during the hospital stay were identified and implemented the documentation of valid period.

LOCKING THE IMPROVEMENT

The quality control measures employed were:

- Implementation of Clinical pharmacist driven Prescription Drug Monitoring Programme (PDMP)
- Implementation of Electronic Prescription Audit Tool with Automated Drug Error Message Alert System for monitoring outpatient electronic prescriptions
- Automated Pop up Alerts
- Electronic discharge summary review process
- Mandatory documentation of valid period

CLONING THE IMPROVEMENT

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The concept of Electronic prescription audit tool can be cloned to Inpatients areas also to improve the turnaround time of manual auditing and real time monitoring of prescriptions as on when it is ordered through CPOE. This will improve the identification of more number of cost effective interventions to Inpatients.

TANGIBLE RESULTS

- ❖ Unit dose cost of INR 4875.73 and Anticipated dose cost INR 26890.8 was saved from outpatients, were majority of the cost saving interventions was associated with Therapeutic Duplication (43.4%) and Drug Interaction (25.7%).
- ❖ INR 7,61,570 was saved from Inpatients with majority of errors were associated with selection of dosage forms.

In addition to this , Prescription drug monitoring program may also help patients to,

- Improve the quality of life by avoiding the administration of inappropriate drugs
- Adverse drug events associated with polypharmacy.
- Reduced length of stay and prevention of hospital readmission.
- Reduced morbidity rate.

END OF PRESENTATION

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THANK YOU