



Prescribing Errors Uncovered: Pharmacist Capture, Documentation and Analysis To Support Quality Improvement

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Background

- Medication incidents are the leading cause of injury and avoidable harm in health care systems
- Up to 70% of medication errors are prescribing errors, occurring in 50% of hospital admissions
- North American regulatory bodies, standards and associations endorse pharmacist review of all prescriptions before administration of the first dose,
- Most Canadian hospitals do not have 24/7 prospective pharmacist medication order review
- Research on documentation and analysis of prescribing errors, to support pharmacist after-hours resources is lacking in Canada

Description

- Despite long-standing implementation of computer prescriber order entry, prescribing errors remain prevalent.
- Prescribing error causation and effective interventions to prevent prescribing errors remains understudied
- Due to the frequency of errors, and, the time required to report these errors, medication reporting systems within health care facilities and external platforms are underutilized.

Action

Literature was explored to identify research:

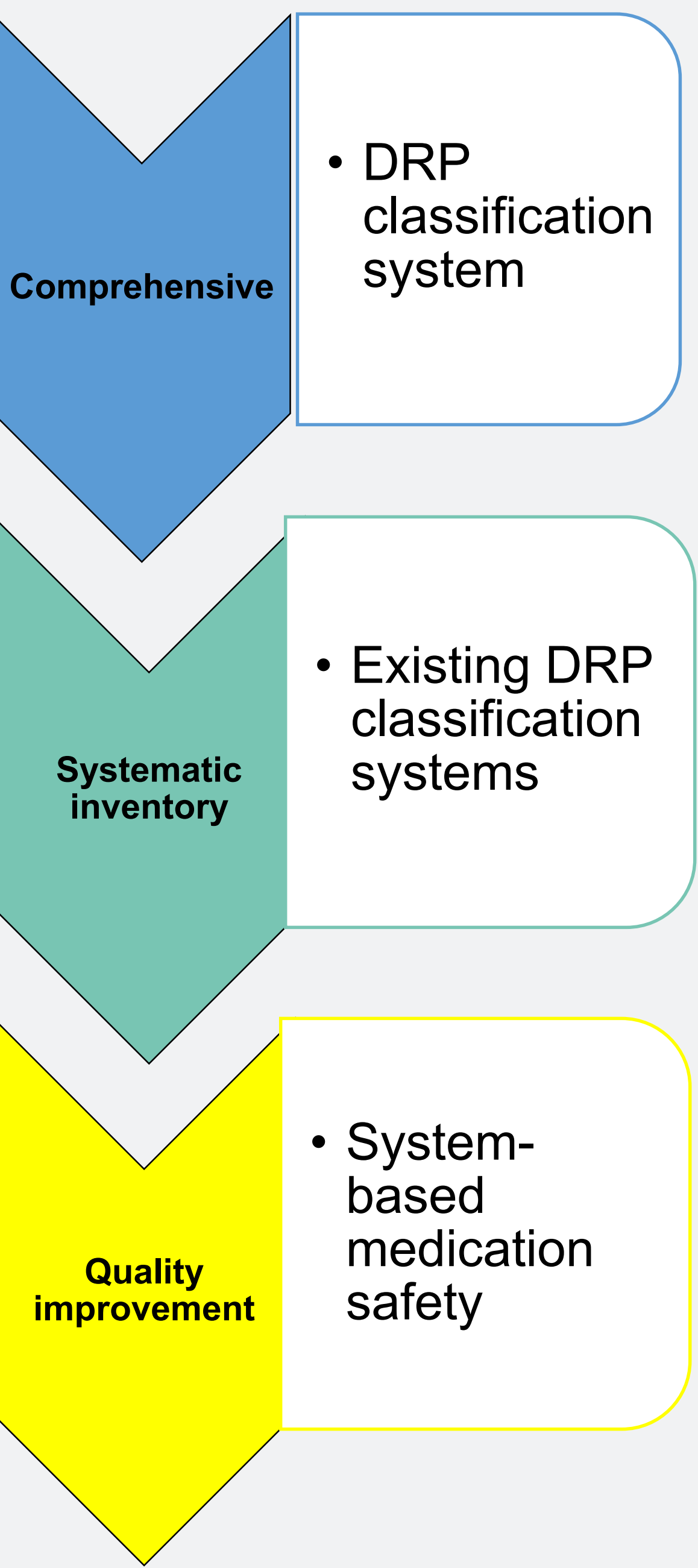
- that observed pharmacist interventions/prescribing errors while performing prospective medication order review in health care facilities
- that assessed tools for pharmacist documentation of prescribing errors in health care facilities

- Historical reports of 'good catches' by telepharmacists that had been shared adhoc to the Senior Manager of Operations by telepharmacists were collected and compiled
- Microsoft Office Forms, a cloud-based documentation tool was created to enable pharmacists to efficiently document prescribing errors prospectively while performing medication order review
- A cause-based classification system for documenting prescribing errors, based on causation was tested for feasibility of documenting and classifying historical adhoc reports and new prospective prescribing errors via cloud-based tool identified by telepharmacists

Action

Table 1: Drug-therapy problem (DTP) classification system for classifying severe medication errors¹

DTP Cause Category	Subcategory	Sub-subcategory
Drug Selection	Inappropriate drug due to a contraindication, ineffectiveness, regimen or safer alternative available	Precaution with use of the drug
		Drug absolutely contraindicated
		Drug is not the most effective treatment for the patient's medical condition according to guidelines
	No indication for the drug	
	Inappropriate combination of drugs, or drugs and food, or drugs and alcohol	A drug interaction cause/causes an undesirable reaction by increasing the therapeutic effect of one of both drugs
		A drug interaction may cause/causes an undesirable reaction by decreasing the therapeutic effect of one or both drugs
		Preventative drug therapy is required to reduce the risk of developing a new condition
	Synergistic/preventative drug not given	A medical condition requires additional pharmacotherapy to attain synergistic or additive effects
Drug Form	Inappropriate or suboptimal drug form	
Dose Selection	Dose too high	
	Dose too low	
Treatment Duration	Deterioration/improvement of disease state requiring dose adjustment	
	Duration too long	
Drug Use Process	Duration too short	
	Inappropriate time of administration and/or dosing intervals by patient/nurse/carer	
	Drug underused/under-administered	
		Patient barriers present
	Drug overused/over-administered	Adequate information about the drug not provided
	Patient/career, nurse unable to use/does not use drug/form as directed	Adequate information about the disease state management not provided, understood, or not followed
Logistics	Adequate information not provided or not understood/misunderstood or followed	
	Prescribed drug not available	Drug has been discontinued, not formulary, out of stock/backorder
	Drug order incorrect, incomplete, poorly legible or discrepant	Drug order/transition of care discrepancy (Medrec)
Monitoring	Error in drug selection	
	None, or too infrequent monitoring	Monitoring of disease state absent or too infrequent
Unexpected ADR/no cause for DRP	Adverse drug reaction	Therapeutic drug monitoring absent or too infrequent
Other		Drug causes undesirable reaction at normal therapeutic dose



¹ Linden-Lahti, C., Takala, A., Holmström, AR, et al. Applicability of drug-related problem (DRP) classification system for classifying severe medication errors. BMC Health Serv Res 23, 743 (2023)

Figure 1: Cloud-based prospective capture of pharmacist identification prescribing errors

"one which occurs when, as a result of a prescribing decision or prescription-writing (entering) process, there is an unintended, significant reduction in the probability of treatment being timely and effective, or increase in the risk of harm when compared with generally accepted practice"²

² Dean B, Barber N, Schachter M. What is a prescribing error? Qual Health Care. 2000;9:232-7



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Evaluation

- Pharmacists were able to document prescribing errors after hours using a cloud-based form while performing medication order review
- The cause-based classification system effectively categorized all identified prospective and retrospective prescribing errors

Figure 2: Prescriber Error Interception Examples Using DTP Cause-based Classification System¹

Drug Selection
Inappropriate drug
Drug absolutely contraindicated - severe epistaxis, INR high, warfarin ordered to continue

Drug Form
Inappropriate drug form
Depo-medrol ordered to be administered IV

Dose Selection
Dose too low
Pediatric patient ordered IV metronidazole as 10mg/kg/day (intent was 10mg/kg/dose)

Treatment Duration
Duration too long
New start daily oral azithromycin no stop date

Drug Use Process
Unable to use drug as directed
Patient barriers present -Hazardous drug oral tablet ordered to be administered NG

Logistics
Drug order incorrect
Medrec -BPMH included lomustine, ordered to continue, not a home medication

Error in drug selection
Rifampin ordered instead of rifaximin

Unexpected ADR
Ibrutinib ordered, admitted with hyponatremia (possible cause)

Implications

- Pharmacists play a critical role during medication order verification in clinically evaluating patients to ensure appropriate medication use and prevent patient harm.
- Consistent, timely, and meaningful documentation of prescribing errors intercepted by pharmacists supports the establishment of a comprehensive database.
- Classification of errors based on causation enables analysis to identify trends, areas of risk, system improvements, shared learning, continuous quality improvement and further substantiate 24/7 pharmacist medication order review

Disclosure Summary

Newman, P. Employed by Northwest Telepharmacy Solutions
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