

Analysis of drug utilization review (DUR) alerts and pharmacist actions taken to improve accuracy of DUR evaluations

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OVERVIEW

- **Drug Utilization Review (DUR):** Continuous process that evaluates prescribing and dispensing of medications for safe use
- **Pharmacist Role in DUR:** Identify potential medication issues, improve patient outcomes, and reduce healthcare costs
- **Challenges with Alert Fatigue:** Excessive or irrelevant alerts may lead clinicians to overlook significant warnings and compromise patient safety.
- **Current Needs:** Relevant, evidence-based DUR alerts that are also clinically relevant to reduce alert fatigue
- **ISMP Recommendation:** Periodically evaluate pharmacy systems surrounding DUR alerts and take action to minimize alert fatigue¹
- **Gap in Literature:** Little published guidance on best practices on how to evaluate DUR alerts in medication dispensing systems

OBJECTIVES

1. **Characterize** the type, frequency, and presentation of DUR alerts triggered in our health system's medication dispensing system in a given time period.
2. **Analyze** the actions taken and documentation provided by outpatient pharmacists when reviewing triggered DUR alerts.
3. **Propose recommendations** for improvement on the type, frequency, and presentation of DUR alerts triggered in our system to optimize system build for future DUR alerts.

METHODS

- **Study Design:** Retrospective study conducted across nine outpatient pharmacies within a single health system
- **Inclusion Criteria:** DUR alerts overridden for all medications generated in the medication dispensing system (Epic Willow Ambulatory) from October 1, 2024, to December 31, 2024
- **Exclusion Criteria:** DUR alerts generated within other medication dispensing systems
- **IRB Approval:** Obtained as a quality improvement project
- **Data Collected:** Pharmacy location, date and time of DUR alert, medications involved, alert name, alert category, alert severity, and pharmacist response to alert
- **Data Analysis:** Descriptive statistics to characterize the type, frequency, and presentation of DUR alerts, and qualitative summaries to analyze pharmacist responses

PRELIMINARY RESULTS

Over a three-month period with a team of 73 pharmacists across 9 outpatient pharmacies:

- 16,653 patients were served
- 2,400 unique alerts
- 93,010 DUR alerts were generated
- 7 categories of alerts

Table 1. DUR Alerts by Category

Alert Type	n (%)
Duplicate Therapy	33,765 (36.3)
Drug-Food	26,909 (28.9)
Drug-Allergy	22,087 (23.7)
Drug-Drug	6,923 (7.4)
Dose	1,779 (1.9)
Pregnancy	1,401 (1.5)
Lactation	146 (0.2)

Table 2. Pharmacist Responses to DUR Alerts

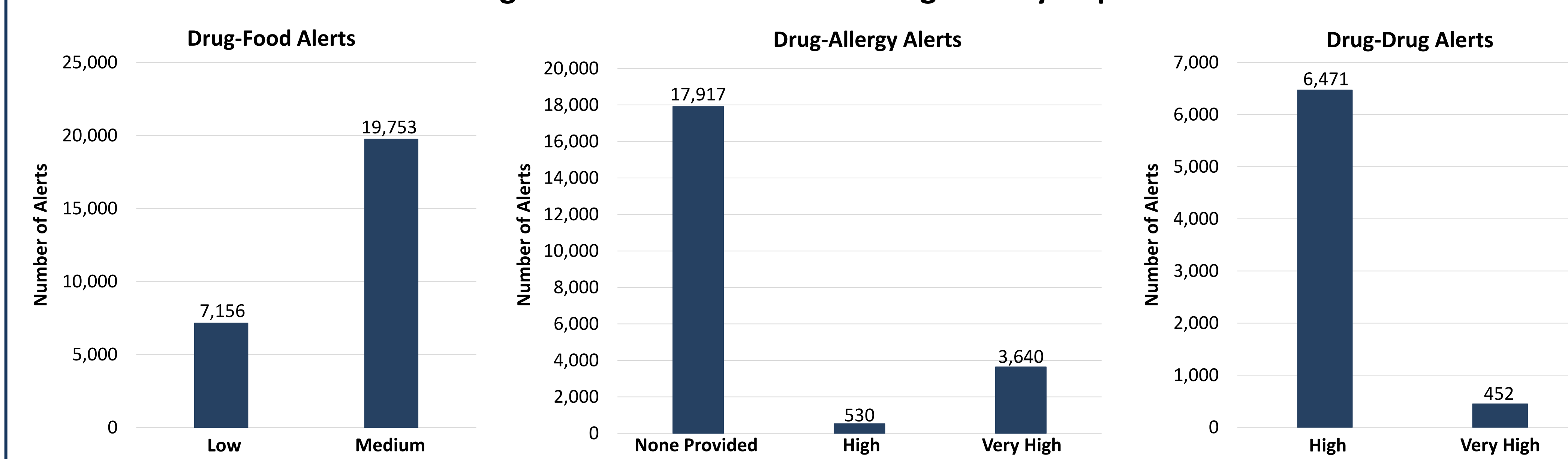
Override Reason*	n (%)
Clinician Reviewed	83,139 (89.4%)
Dose Appropriate	9,323 (10.0%)
Benefit Outweighs Risk	495 (0.5%)
Inaccurate Warning	48 (0.1%)
(Left blank; comment only)	5 (<0.1%)

*Override reason provided by clicking one of four radial buttons. A free-text comment may be added for additional context or can serve as the override reason.

Table 3. Drug-Drug Alerts Response by Severity

Drug-Drug Alert Severity	n (%)
Severe Interaction	6,471 (93.5)
<i>No comments provided for 6,404 (92.5%) of alerts</i>	
<i>Comments provided for 67 (1.0%) of alerts</i>	
Clinician Reviewed	5,742 (82.9)
Dose Appropriate	693 (10.0)
Benefit Outweighs Risk	33 (0.5)
Inaccurate Warning	3 (<0.1)
Contraindicated	452 (6.5)
<i>No comments provided for 441 (6.4%) of alerts</i>	
<i>Comments provided for 11 (0.2%) of alerts</i>	
Clinician Reviewed	389 (5.6)
Dose Appropriate	59 (0.9)
Inaccurate Warning	2 (<0.1)
Benefit Outweighs Risk	2 (<0.1)

Figure 1. Select DUR Alert Categories by Importance**

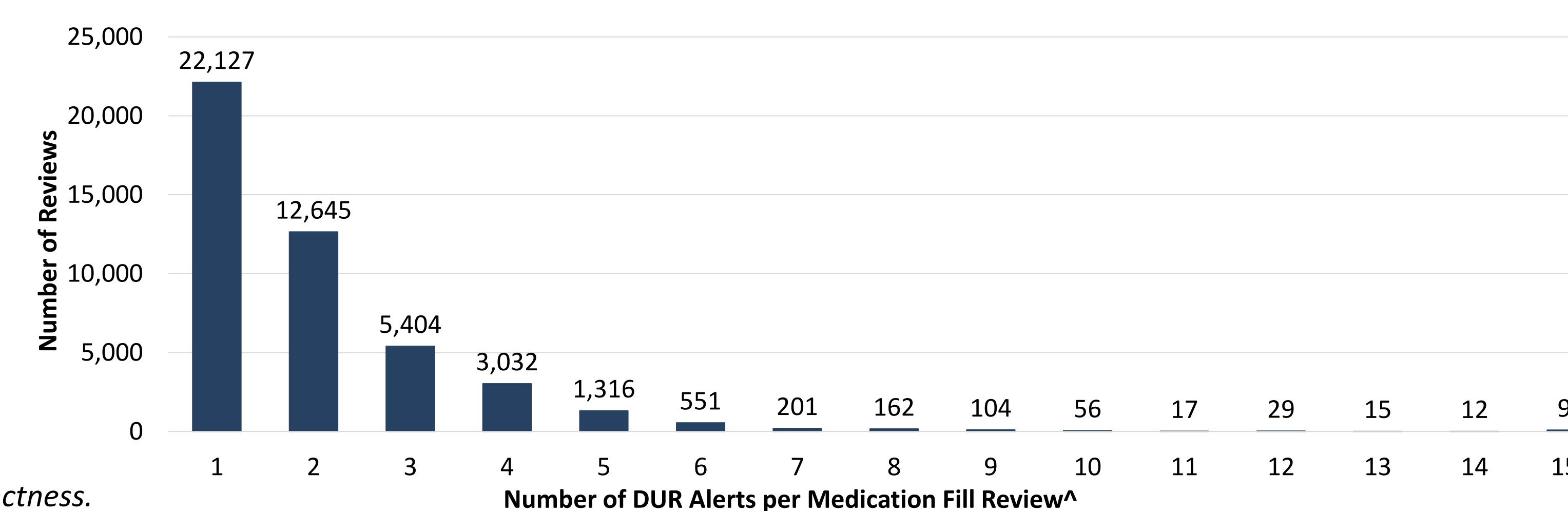


**Note: All the Duplicate Therapy alerts were flagged as High importance. A graph was not depicted, as there was only one importance level for these alerts.

Figure 2. Number of DUR Alerts Triggered per Medication Fill Review

Summary Statistics:

- Median: 2 alerts
- Minimum: 1 alert
- Maximum: 89 alerts



*Note: X-axis ends at 15 alerts for succinctness.

DISCUSSION

- **Pharmacist Responses:** Trends may challenge the utility of radial buttons (Clinician Reviewed) with respect to medication safety, suggesting that routine action may be a contributing factor
- **Drug-Drug Alerts:** Relative lack of detailed explanations for why severe or contraindicated interactions are overridden raises the question of whether free-text explanations for these alerts should be required in our system.
- **Applicability to All Pharmacy Practice Settings:** Infusion, inpatient, ambulatory care, and community pharmacies should all evaluate DUR alerts and analyze trends, regardless of the specific software deployed.
- **Barriers to Change:** Consider effects of DUR alert changes to other health care disciplines who utilize the same software.
 - The alert settings of the medication dispensing system in this study are integrated with the rest of the health system.
 - This health system's home infusion software is freestanding and used only by pharmacy, but it contains less robust DUR alert data for analysis.

NEXT STEPS

1. Assess the perceived clinical value of **Drug-Food** alerts and explore options to reduce prevalence of alerts.
2. Investigate prescription transmission workflows and patient information sources that result in **Duplicate Therapy** alerts.
3. Explore reduction of **Drug-Allergy, Dose, Lactation, and Pregnancy** alerts due to potential irrelevancy.
4. Evaluate composition of multiple alerts triggered at the same time and how that may affect pharmacist response.
5. Apply proposed changes to DUR alerts from the studied system to the health system's home infusion medication dispensing software.

REFERENCES

1. Institute for Safe Medication Practices. 2017 ISMP Medication Safety Self Assessment for Community/Ambulatory Pharmacy. Accessed February 20, 2025. https://www.ismp.org/sites/default/files/attachments/2017-11/2017_ISMP_Community_Ambulatory_Pharmacy_Self_Assessment.pdf

DISCLOSURES

The authors have nothing to disclose.

