



OPTIMIZING CLINICAL DECISION SUPPORT FOR PHARMACISTS



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BACKGROUND

- Clinical decision support enhances the quality of care by presenting the most pertinent evidence-based information to the physician at the point of care.
- Many studies demonstrate the effectiveness of implementing clinical decision support systems, but there is little research in the optimization of clinical decision support rules after the initial go-live.
- Without significant study of workflow processes and alert usability, clinical decision support performance and reliability by end-users wane over time.

OBJECTIVES

- Collect clinical decision support system alert and intervention data and examine the potential for identifying suboptimal rule logic and methods for optimization.
- Investigate methods to proactively reduce alert fatigue and enhance optimization techniques.
- Improve clinical decision support for pharmacists and ultimately improve patient care.

METHODS

- Clinical decision support data from the prospective pharmacy clinical surveillance system was harvested for the month of July 2020 from 70 hospitals in a large national health-system.
- The data included the facility, alert, alert priority, total number of patients, number of patients assessed by a pharmacist, number of interventions documented by a pharmacist, median response time of the interventions, time from alert firing to intervention, duration that each alert was true, and number of alert firings per patient for each rule.
- The data points were used to identify trends that indicated instances where performance of alerts was suboptimal.
- Data was presented at national clinical pharmacy leadership committee meetings for review and evaluation.

RESULTS

MEAN PERCENTAGE OF PATIENTS ADDRESSED

Rule	Sum of Qualifying Patients	Sum of Patients Addressed	Mean % of Patients Addressed
No VTE Prophylaxis	1950	215	13.37%
Blood Sugar >250	1329	138	14.28%
Renal Dosing - Piperacillin/Tazobactam	1324	613	42.19%
Heart Failure Identification with BNP/NT-proBNP	1968	934	44.45%
COVID-19 Positive Test (Pharmacy)	4763	2298	44.98%
Initiative - IV Corticosteroids	2430	1141	45.73%
Open interventions	14078	6752	48.55%
IV to PO Azithromycin	1426	829	49.85%

MEAN NUMBER OF ALERTS PER PATIENT

Rule	Number of Alerts	Number of Patients	Mean # Alerts per Pt
Heart Failure Identification with NT-proBNP	5378	418	12.86602871
Initiative - Albumin Assessment	3354	808	4.150990099
Renal Dosing - Piperacillin/Tazobactam Not Extended Infusion	575	150	3.833333333
All Warfarin patients - ININD	877	240	3.654166667
Positive cultures @ 7 days (sterile sites) Copy	1713	502	3.412350598
Vancomycin Monitoring (All patients) Copy	7053	2078	3.39412897
Initiative - TPN Assessment	2433	722	3.369806094
All warfarin patients	4059	1241	3.270749396

NUMBER OF RULE FIRINGS

Rule	Number of Rule Firings	Rule	Number of Rule Firings
Open interventions	14078	Renal Dosing - Famotidine	1964
Vancomycin Monitoring (All patients)	6635	No VTE Prophylaxis	1950
IV to PO Famotidine	4856	Positive cultures @ 72 hours (sterile sites)	1918
COVID-19 Positive Test (Pharmacy)	4763	Renal Dosing - Cefepime	1862
IV to PO Pantoprazole	3993	Heparin Therapeutic monitoring	1840
Enoxaparin Therapeutic Monitoring	3841	IV to PO Metronidazole	1730
Initiative - IV Corticosteroids	2430	Heparin Therapeutic monitoring*	1539
Renal Dosing - Enoxaparin	2228	COVID-19 Medication Rule	1454
Broad Spectrum Beta-Lactam Review at 72 hr	2064	IV to PO Azithromycin	1426
Vancomycin Monitoring (All patients) Copy	2058	Blood Sugar >250	1329
Procalcitonin De-escalation	2053	Renal Dosing - Piperacillin/Tazobactam	1324
Risk for Oversedation	1984	All warfarin patients	1266
Heart Failure Identification with BNP/NT-proBNP	1968	Renal Dosing - Apixaban	1250

DISCUSSION

- The results section is only an excerpt from numerous reports.
- A closer review of the rules and interventions that fired and feedback received from clinical pharmacists nationwide indicated that 14% of the alerts can be eliminated.
- Feedback also suggested review and evaluation of a total of 41% additional alerts.

CONCLUSION

- The rules associated with higher mean percentages of patients assessed may be associated with higher efficiency in rule logic and workflow processes.
- Rules that fired multiple times per patient triggered further review.
- This method of data analysis provided a wealth of information that will allow for the implementation of a wide variety of rule optimization strategies and potential to increase the quality of care on a large scale.
- Ongoing significant review of rule and intervention of performance metrics can reduce alert fatigue, improve patient safety, and enhance workflow for pharmacists.

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