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 interventions, time from alert firing to intervention, duration that interventions were documented by a pharmacist, median response time of interventions, 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**

- **Number of Rule Firings**
  - Number of Rule Firings: 34078
  - Number of Alerts: 2078
  - Number of Patients: 2078

- **Mean Number of Alerts per Patient**
  - Average Number of Alerts: 14.66
  - Average Number of Alerts per Patient: 7.33

- **Mean Percentage of Patients Addressed**
  - Rule: No VTE Prophylaxis
    - Sum of Patients Addressed: 215
    - Mean % of Patients Addressed: 13.37%
  - Rule: Blood Sugar > 200
    - Sum of Patients Addressed: 138
    - Mean % of Patients Addressed: 14.28%
  - Rule: Renal Dosing - Pipercillin/Tazobactam
    - Sum of Patients Addressed: 613
    - Mean % of Patients Addressed: 42.19%

- **Heart Failure Identification with BMP/NT-proBNP**
  - Number of Alerts: 4763
  - Number of Patients: 2298
  - Mean % of Patients Addressed: 44.45%

- **COVID-19 Positive Test (Pharmacy)**
  - Number of Alerts: 1436
  - Number of Patients: 829
  - Mean % of Patients Addressed: 49.40%

**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 high 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.

**References**