Leveraging Technology to Advance Medication Safety

Program or project description, including goals
This initiative was proposed in an effort to ensure the optimal use of pharmaceuticals and improve overall patient safety. DoseEdge is utilized to maintain accuracy in ingredient selection and comprehensive dose verification prior to dispensing. Other technologies were also explored to improve analytics and better achieve pharmacy quality measures. These include Quality Compass, Discern Explorer, and Rx Auditor which are utilized to generate custom reports which aide in monitoring and reducing drug-bug mismatches, dosing errors, and polypharmacy issues. As well as, provide opportunities for pharmacists to make quality interventions.

Goal: The goal of these initiatives are to improve overall patient safety in the medication use process by driving performance through data forcing functions.

Process implemented
In order to have the greatest potential impact, the pharmacy department chose to align the use of these technologies with key quality measures, such as prescribing, dispensing, administration, and monitoring. Pharmacy staff and residents developed custom reports that generate data on these quality measures. Findings are disseminated to administration and clinical staff for possible solutions and plans for improvement.

Solution identified
Remote online verification allows for dose verification from any hospital location which helps to promote dose preparation safety and facilitate uniform processes among users. Automatic calculations and barcode verification of ingredients help reduce key sources of preparation errors, such as wrong drug selection and incorrect dose concentration. Discern Explorer leverages Cerner data for analysis which can be used to make quality interventions pertaining to potential adverse drug events. Quality compass can be utilized to generate custom reports and fire alerts to clinicians, such as drug-bug mismatch alerts, which capture and intervene on cases where patients have an active order and are intermediately or fully resistant to that antimicrobial.

Measurable outcomes:
- Number of clinical interventions (ex. Drug-Bug Mismatch) and antibiotics with an extended duration of 10 days or more
- Percentage of prevented errors (ex. Incorrect Drug, Concentration Mismatch, etc.) in the last 15 days
- Number of medications scanned by pharmacy technicians prior to placement in the automated dispensing cabinet (ADC)
- Percentage of INR > 3.5 after 48 hour length of stay

Sustainability
This new initiative employs a large number of staff (clinical specialists, decentralized pharmacists, pharmacy residents, pharmacy students, and quality improvement committee) to ensure the optimal use of pharmaceuticals and improve overall patient safety. This is a sustainable initiative because it has become part of pharmacist/pharmacy resident clinical duties to gather and evaluate data reporting these events. Results are shared with end users on a monthly and quarterly basis to drive practice changes. This extends to the quality improvement/risk management committee who also weigh in biennially upon how to better utilize these resources to manage quality and improve individual and community health. In recent quarters, an increase has been noted on the Pyxis scan rates and prevented medication errors. An improvement has also been observed in antibiotic stewardship through new metrics provided by pharmacy surveillance.
**Role of collaboration and leadership**
Collaboration played a large role in the development of this program. The medical and nursing staff requested the pharmacy department's help, recognizing the accuracy and status of medications available on the units. Moreover, the medical staff collaborates with pharmacy to highlight areas for improvement and delineate plans to improve upon each quality measure. Pharmacists demonstrate leadership by proactively gathering quality data from these various technologies regarding errors and safety concerns and disseminate their findings to clinical staff. Collaboration with other disciplines is imperative in highlighting key areas and targets for improvement. This continuous collaboration with the medical/nursing staff and quality improvement committee has been met with great support.

**Innovative attributes**
What makes the implementation of these technologies unique is that there capabilities have been leveraged to achieve key quality measures and improve overall medication/patient safety. Through training and process implementation, a variety of pharmacy staff, clinical specialists, and residents have generated custom reports which quantify key patient safety goals and allow opportunities for improvement and quality pharmacist interventions. The utilization of these technologies allows pharmacists to provide more clinical services to patients and improve patient care experience, which in turn leads to improvement in patient and medication safety.

**Related tools and resources**
Resources used in this process include the pharmacy workforce; DoseEdge, Discern Explorer, Rx Auditor, and Quality Compass software, references and personnel.

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