

Digital Medication Review Process Enhancing Patient Safety Outcomes

Category: Digital Excellence

Focus Area: Implementation and effective use of Clinical Applications

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Problem Statement / Digital Challenge

Medication errors remain a significant patient safety concern in healthcare settings. In a large tertiary care hospital, thousands of medication orders are prescribed daily for admitted patients. Manual review of prescriptions is often time-intensive and may not consistently identify errors related to incorrect dose, route, frequency, therapeutic duplication, drug-drug interactions, drug-food interactions, and inappropriate dosing in patients with renal or hepatic impairment. Such errors can lead to adverse drug events, increased length of stay, higher treatment costs, and compromised patient outcomes.

Prior to implementation of a digital review process, pharmacists relied on conventional methods of prescription review, making it challenging to ensure timely assessment of all inpatient medication orders. The absence of a centralized, real-time monitoring mechanism increased the risk of prescribing errors progressing further in the medication management process.

The challenge was to establish a technology-enabled system that could facilitate comprehensive and timely review of all medication orders across the hospital, support clinical pharmacists in identifying potential medication-related risks, and enable prompt communication with prescribing physicians for corrective action. The initiative primarily impacted patients, physicians, clinical pharmacists, nursing staff, and the overall medication management system by strengthening medication safety and reducing preventable prescribing errors before medications reached the patient.

Digital Tool / Solution Implemented

To address medication safety challenges, a Clinical Pharmacy Verification Module integrated with the Computerized Patient Record System (CPRS) was implemented. Whenever a physician places a medication order in CPRS, the prescription is automatically reflected in a centralized Clinical Pharmacy dashboard for review.

Clinical pharmacists verify each medication order against predefined safety parameters including right medication, right dose, right route, right frequency, correct indication, drug-drug interactions, drug-food interactions, therapeutic duplication, duplicate orders, and medication appropriateness in renal and hepatic impairment.

Any identified discrepancy is communicated to the treating physician for review and modification before medication dispensing or administration. The digital platform ensures systematic and real-time review of inpatient medication orders, enabling early identification of prescribing risks and supporting safer medication management practices throughout the hospital.

Digital Implementation Highlight

Successfully integrated the Clinical Pharmacy Module with the existing Computerized Patient Record System (CPRS).

Established a real-time electronic workflow for medication order review across all inpatient areas.

Created a centralized dashboard enabling clinical pharmacists to monitor and verify medication orders hospital-wide.

Implemented standardized verification criteria covering dose, route, frequency, indication, drug interactions, therapeutic duplication, and renal/hepatic dose adjustments.

Enabled timely pharmacist intervention before medication dispensing and administration.

Strengthened communication and collaboration between physicians and clinical pharmacists through a structured review process.

Improved visibility of medication-related risks and facilitated prompt corrective actions.

Enhanced compliance with medication safety standards and best practices.

Reduced the likelihood of preventable prescribing errors reaching patients.

Promoted a proactive patient safety culture by shifting error detection to the prescribing stage rather than after medication administration.

The implementation was led collaboratively by the Clinical Pharmacy, Information Technology, Quality, and Medical teams. Continuous monitoring, user training, and stakeholder engagement ensured smooth adoption and sustainability of the initiative. The system has become an integral component of medication safety practices and supports the hospital's commitment to delivering safe, effective, and patient-centered care.

Digital Impact

The implementation of the Clinical Pharmacy Verification Module has significantly strengthened medication safety across the hospital by enabling real-time review of

all inpatient medication orders before administration. The system has improved operational efficiency by eliminating delays associated with manual prescription review and providing a centralized dashboard for medication monitoring.

The digital workflow supports early identification of prescribing errors, including incorrect dose, route, frequency, therapeutic duplication, drug-drug interactions, drug-food interactions, and inappropriate prescribing in patients with renal or hepatic impairment. Timely pharmacist interventions help prevent medication-related harm and improve patient outcomes.

The initiative has enhanced interdisciplinary collaboration between physicians and clinical pharmacists, improved documentation and traceability of medication reviews, and strengthened compliance with medication management standards. The system supports NABH requirements related to medication safety, clinical governance, risk management, and patient-centered care by ensuring that prescription-related risks are identified and addressed before reaching the patient.

Key Enablers / Innovations

A key enabler of this initiative was the seamless integration of the Clinical Pharmacy Module with the Computerized Patient Record System (CPRS), enabling automatic transfer of medication orders for pharmacist review. The centralized dashboard provides hospital-wide visibility of inpatient prescriptions and facilitates timely verification of medication orders.

The innovation lies in embedding a structured clinical pharmacy review process within the electronic prescribing workflow. The system supports comprehensive

assessment of medication orders against multiple safety parameters, including dosage appropriateness, route, frequency, indication, drug interactions, therapeutic duplication, and renal/hepatic dose adjustments.

Successful implementation was driven by strong leadership support, collaboration among Clinical Pharmacy, Medical, Information Technology, and Quality teams, standardized review criteria, and continuous user training. Challenges related to workflow integration and change management were addressed through stakeholder engagement, phased implementation, and regular monitoring, ensuring sustained adoption and effectiveness.

Key Learnings & Sustainability

The project demonstrated that integrating clinical pharmacy review within the electronic prescribing process can significantly enhance medication safety and prevent prescription errors before they reach patients. Real-time digital review enables proactive risk identification and timely clinical intervention, resulting in safer medication management.

A second key learning was the importance of multidisciplinary collaboration among physicians, pharmacists, quality professionals, and IT teams to ensure successful implementation and user acceptance.

The initiative is sustainable because it is embedded within routine clinical workflows and supported by an integrated digital platform. Continuous monitoring, staff training, periodic review of medication safety parameters, and ongoing stakeholder engagement ensure long-term effectiveness. Hospitals seeking to implement similar practices should focus on strong system integration, standardized review processes, and active involvement of clinical pharmacists to maximize patient safety benefits.

and operational efficiency.

Reference Sources (If Applicable)

<https://www.epicresearch.org/articles/improved-barcode-scanning-for-medication-administration-with-mobile-devices-compared-to-standalone-scanners/>