Enhancing Medication Safety in Hospitals: Strategies for Error Prevention

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Background

KD Hospital is a multi-speciality hospital covering nearly 45 specialties and 300+ beds for patients. They have 7 different accreditations and have also received platinum-level status in digital standards by the National Accreditation Board for Hospitals. In 2024, the hospital launched comprehensive medication safety program to address critical gaps and enhance patient safety.

Distinctiveness of the Practice

KD Hospital had devised a comprehensive medication management program which integrates technology with the organization practices and leadership initiatives to minimize medication errors.

- **Standardising the Medication Administration:** The hospital developed a standardised protocol for administering the medicines to the patients through a bowl rather than with hand. This simple, yet effective step minimized errors in medication administration due to negligence, and oversight in the number of medicines dispensed.

Fig.3 Administration of medicine using bowl

- **OWN and OMIT medical pouch System:** The OWN pouch contains medications that the patient should continue using, either as previously prescribed or deemed necessary for their treatment while the OMIT pouch holds medications that are no longer required or potentially conflict with new prescriptions.
- **High-Risk Indent Alert Software:** This technology integrated feature of the safe medication program in the HIS triggered an immediate notification, whenever the high-risk medicines were prescribed. Upon receiving the alert, two healthcare professionals reviewed and verified the order before it was administered to the patient. The software maintained a database of high-risk medications, continuously updating and refining alerts based on real-time patient data and evolving best practices.
- **Anti-microbial stewardship Program:** This program ensured the rational use of antibiotics. Under this program, the hospital undertook regular audits related to antimicrobial use. Healthcare providers filled out the forms like culture and antibiotic data forms which provided an oversight mechanism to irrational use of antibiotics.
- **MedSafe Champions:** These champions are designated individuals across different hospital departments who took active leadership roles in medication safety initiatives. These champions proactively monitored and analyzed medication errors, by educating and mentoring their peers on

recommended practices for medication. administration and documentation leading to improved self-reporting of medication errors.

- **Two-Tiered Self Reporting System:** The action on self-reporting errors were enhanced through two-pronged approach: (1) Using a customised mobile-based application for reporting these errors; (2) Whatsapp Group for quicker communication between managers and MedSafe champions leads to prompt action.

Fig.2 Self-reporting system including WhatsApp group chat and MedQPro app

- **Constructive Error Management:** This method ensured that medication errors were addressed in a way that prioritized education and continuous improvement over punishment. The hospital had developed a multi-faceted strategy that reinforces patient safety protocols while fostering a culture of learning and professional development among healthcare staff.
- **Rigorous Auditing Mechanisms:** Three distinct groups conducted audits to reinforce patient safety measures. MedSafe Champions carried out daily audits, systematically monitoring medication safety compliance and identifying any discrepancies in medication storage and administration. In addition to internal audits, random audits were conducted by the clinical pharmacists, providing an unbiased assessment of medication practices and helping identify areas for further improvement. Quality Department conducted twice-monthly audits, ensuring that all departments adhered to established protocols and maintained stringent safety measures.
- **Comprehensive Training Programs:** KD Hospital prioritized staff competency by implementing systematic training initiatives that were pre-planned and integrated into the hospital's calendar. The training programs were classified into Yellow, Orange, and Red Belts, with each color indicating the type and level of training required for nurses. Critical areas of care necessitated Red Belt training, ensuring that nurses received the highest level of instruction for essential procedures. The training programs were customised in accordance with the need of the nursing staff.

Fig.4 Red, Orange, Yellow training calendar

Fig.5 KD SAIL learning posters for training seminars and labs

- **Engaging Technological Tools:** KD Hospital effectively utilized modern technological tools to maintain staff engagement and enhance learning experiences through following ways:
  - Short reels with targeted messages: These reels were used as a continuous reinforcement tool, keeping patient safety principles at the forefront of daily operations.
  - Simulation labs for hands-on practice: These labs simulated real-life medical

scenarios, enabling staff to gain practical experience without the risk of harming patients.

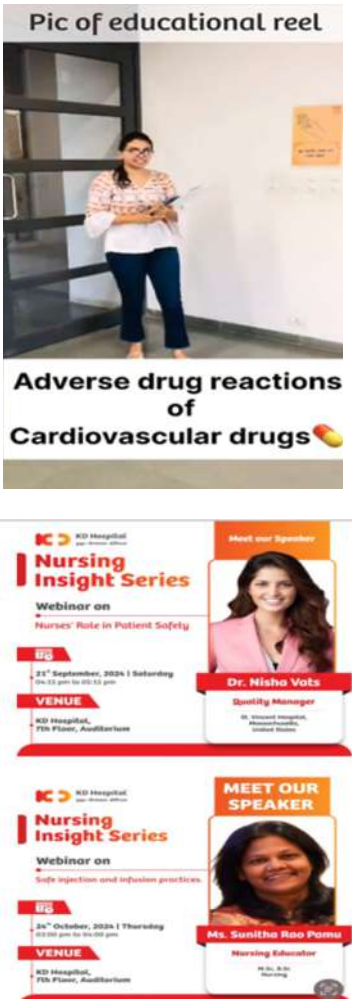

Fig.6 Educational reel screenshot and webinar poster

Measuring Effects

- Under the supervision of MedSafe Champions, error reporting rates increased significantly, rising from 35% to 90%, marking a substantial cultural shift towards transparency and accountability. The previous standard of reporting nearly tripled, as staff became more comfortable with acknowledging errors in a no-blame environment.
- Auditing mechanisms proved highly effective, with overall compliance rates reaching 94-100% after implementation in February 2024. Department-wise, compliance was consistently high, with the general ward, nursing, 8th floor, and twin-sharing ward achieving 100%, 99%, 97%, and 96% compliance, respectively. The introduction of rigorous audits ensured that staff remained vigilant and upheld a standard of excellence in patient care.
- According to the KD Quality Indicators Report, inpatient adverse reactions to drugs showed a downward trend post-implementation, reaching zero incidents by November and December 2024.
- Compliance with medication safety protocols also improved, reaching 100% by the end of the year.
- Medication errors remained low, fluctuating between 0.97% and 2.47% from July to November 2024.
- Prescription errors ranged from 3.88% to 15.47%, with all identified errors intercepted before reaching patients. The rise in prescription errors indicated the strong self-reporting system.
- Dispensing errors remained minimal, ranging between 0.06% and 0.75% in the same period.
- Compliance rates for medication reconciliation significantly improved, rising from 74.51% in July to 95.95% by November 2024.

Challenges

Despite its success, KD Hospital faced several challenges in implementing its medication safety practices.

- Resistance to Change: Many healthcare providers were accustomed to traditional methods of medication reconciliation and were hesitant to adopt the structured OWN and OMIT pouch system.
- Technological integration: The high-risk indent alert software needed to be customized to align with existing hospital systems, and staff required technical training to fully utilize the software. This transition phase initially led to minor workflow disruptions, but with continuous support and training, staff adapted effectively.
- Patient co-operation: Many patients were unfamiliar with the OWN and OMIT pouch system and required education on how their

medications were being categorized. Some patients expressed reluctance to discard medications placed in the OMIT pouch, fearing it might affect their treatment. To mitigate this, hospital staff engaged in patient-centered communication strategies, explaining the rationale behind the system and addressing concerns with empathy.

- Financial constraints: Procuring additional resources for training, audits, and technology upgrades required careful budget planning. The hospital management prioritized cost-effective solutions and phased implementation to ensure sustainability without compromising quality.

Lessons Learned

The implementation of medication safety practices at KD Hospital has yielded critical insights and benefits that highlight the importance of early detection, continuous training, and collaborative approaches in fostering patient safety.

- **Early Detection and Intervention:** The hospital has emphasized the significance of early detection and timely intervention in preventing complications related to medication errors. These practices have led to improved patient outcomes by addressing potential risks before they escalate.
- **Motivation Through Continuous Training:** Regular training sessions, through innovative pedagogical tools and simulation labs have been instrumental in maintaining staff motivation. By keeping the staff engaged and informed, the hospital has fostered a culture of continuous learning and professional growth.
- **Enhanced Coordination and Teamwork:** The implementation of medication safety initiatives has significantly improved interdepartmental collaboration, particularly among pharmacy staff, nurses, doctors, clinical pharmacists, supervisors, and quality nurses. This enhanced coordination has streamlined workflows and ensured more effective communication in patient care.
- **Mentorship to Boost Confidence:** The mentorship program has been a cornerstone of success for new staff. Pairing experienced mentors with new recruits has helped build confidence and ensure adherence to safe practices, accelerating their integration into the hospital's safety protocols.
- **Technology Integration:** The adoption of technology, including computer databases for medication management, has streamlined care delivery, enhanced documentation, and reduced the risk of adverse events.

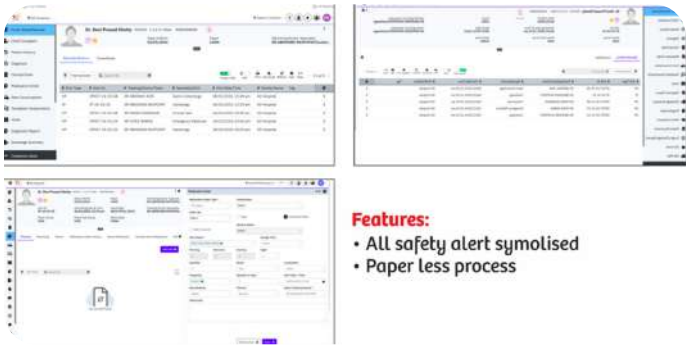

Fig.7 Paperless technological system and software

Sustainability of Practice

KD Hospital acknowledges that its staff is the cornerstone of promoting patient safety, particularly in medication management. By introducing tools and policies designed to support and benefit staff, the hospital has observed significant improvements in provider confidence and performance. Through constructive approaches to error management, staff no longer experience undue guilt for medication errors. Instead, errors are viewed as opportunities for growth, with mandatory training and skill development sessions focused on addressing mistakes and enhancing competency. This supportive environment encourages a culture of accountability and vigilance, leading to a noticeable increase in self-reporting of errors and proactive engagement in safety initiatives. Additionally, the hospital's structured training programs have resulted in a profound increase in staff knowledge of protocols and documentation practices. Regular workshops, mentorship programs, and simulation-based

training have not only reinforced operational skills but also instilled a deeper understanding of medication safety standards. This has empowered providers to uphold the highest standards of patient care.

Conclusion

KD Hospital's medication safety program has successfully transformed patient care by implementing structured processes, fostering a culture of accountability, and leveraging technology to minimize errors. Through strategic training programs, robust auditing mechanisms, and leadership-driven initiatives, the hospital has established a sustainable model for medication safety. The hospital's success demonstrates that a proactive, structured approach to medication safety can lead to significant improvements in patient outcomes, staff engagement, and cost-effectiveness. This practice serves as a replicable model for other healthcare institutions seeking to enhance medication safety and overall patient care.

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1 Target Population

Healthcare providers, including nurses, pharmacists, and physicians.

2 Phenomenon of Interest

Implementation of a structured medication safety program to reduce medication errors, enhance compliance, and improve patient safety through standardized protocols, technology, and staff training.

3 Context

KD hospital with seven accreditations, where gaps in medication safety were identified, leading to the adoption of a comprehensive, technology-driven medication safety program.

Conclusion

KD Hospital's structured medication safety program has successfully minimized errors, strengthened patient safety, enhanced staff accountability, and established a replicable model for improving medication management in healthcare institutions.

Key Findings

1 Reduction in Medication Errors and Adverse Events

Inpatient adverse drug reactions declined to zero incidents by November and December 2024, while compliance with medication reconciliation improved from 74.51% to 95.95%, ensuring safer prescribing and administration practices.

2 Significant Increase in Medication Safety Compliance

Self-reporting of medication errors increased from 35% to 90%, demonstrating a shift towards a culture of transparency and accountability, while overall compliance with medication safety audits reached 94-100%.

3 Enhanced Staff Engagement and Patient Safety Culture

The introduction of MedSafe Champions, structured training programs, technology-based safety tools, and constructive error management significantly improved staff confidence, leading to better adherence to medication safety protocols and a decline in prescription and dispensing errors.