

WHITEPAPER: CLOSED-LOOP ADMINISTRATION

BENEFITS CASE

Closed Loop Administration Overview

Closed-loop medication administration (CLMA) is a system designed to enhance patient safety by ensuring the right medication is given to the right patient at the right time, in the correct dose and via the correct route. It integrates various technologies such as electronic prescribing (e-prescribing), barcode scanning, automated dispensing cabinets (ADCs), and electronic health records (EHRs) to minimize human errors in medication administration.

Key Benefits of CLMA:

Enhanced Patient Safety

Reduces medication errors by verifying patient identity, medication, dose, time, and route before administration.

Prevents adverse drug events (ADEs) by cross-checking prescribed medications with allergy records and contraindications.

Improved Efficiency and Workflow

Automates documentation in the EHR, reducing manual data entry and administrative burden for healthcare providers (nursing staff).

Streamlines medication dispensing and administration, leading to faster turnaround times and better resource allocation.

Regulatory Compliance and Audit Trail

Provides a detailed digital record of medication administration for auditing and compliance with safety regulations.

Enhances adherence to hospital protocols and regulatory guidelines such as those from the FDA, Joint Commission, and WHO.

Reduction in Costs

Lowers the financial burden associated with medication errors, hospital readmissions, and litigation.

Improves inventory management, reducing medication waste and theft.

Real-Time Decision Support

Integrates with clinical decision support systems (CDSS) to provide alerts for potential drug interactions, allergies, or dosing errors.

Assists healthcare professionals in making informed decisions with real-time data.

Better Patient Experience and Trust

Patients receive personalized and accurate medication care, leading to improved treatment outcomes.

Builds trust in the healthcare system by ensuring safe and transparent medication processes.

Interoperability and Data Integration

Facilitates seamless communication between pharmacy, nursing, and medical teams, ensuring a closed feedback loop.

Enhances data sharing across different healthcare systems for continuity of care.

Conclusion

Closed-loop medication administration significantly enhances patient safety, efficiency, and compliance while reducing costs and errors. It represents a critical advancement in modern healthcare, ensuring precision and accountability in medication management.

References

1. Franklin, B. D., O'Grady, K., Donyai, P., Jacklin, A., & Barber, N. (2007).
 - Title: The impact of a closed-loop electronic prescribing and administration system on prescribing errors, administration errors and staff time: A before-and-after study
 - Journal: Quality and Safety in Health Care, 16(4), 279–284.
 - DOI: 10.1136/qshc.2006.019497
 - Link: PubMed Central
2. Waqar, U., Sood, S., Ballermann, M. A., & Southern, D. A. (2019).
 - Title: Immediate Impact of Closed Loop Medication Administration on Reported Medication Incidents and Adverse Drug Events
 - Journal: Journal of Patient Safety, 19(2), 105–109.
 - DOI: 10.1097/PTS.0000000000000573
 - Link: PubMed
3. Medanets (2022).

- Title: What is the closed-loop medication process?
- Publisher: Medanets Blog
- Link: <https://medanets.com/blog/closed-loop-medication-process/>

4. Simonsen, B. O., & Johansson, I. S. (2023).

- Title: Closed-loop medication management systems in hospitals: A narrative review of implementation and impact
- Journal: Scandinavian Journal of Caring Sciences
- Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10488169/>

5. Sağlık Bilimleri ve Meslekleri Dergisi (2023).

- Title: The Contribution of Closed Loop Medication Administration (CLMA) to the Hospital System in Terms of Drug Return Reasons
- Journal: European Society of Medicine Journal
- Link: <https://esmed.org/MRA/mra/article/view/2289>

6. Yücel, C., & Baş, S. (2021).

- Title: Measuring the Contribution of Closed Loop Medication Administration (CLMA) System on Drug Invoice Leakage
- Publisher: Sağlık 4.0
- Link (PDF): <https://saglik40.com.tr/storage/uploads/content/206/CLMA-Yay%C4%B1n%C4%B1.pdf>

7. Australian Commission on Safety and Quality in Health Care (2021).

- Title: Evidence briefings on interventions to improve medication safety: Closed-loop medication management systems
- Publisher: Australian Government
- Link: https://www.safetyandquality.gov.au/sites/default/files/2021-08/evidence_briefings_on_interventions_to_improve_medication_safety_4_closed-loop_medication_management_systems_july_2021.pdf