

Improving Medication Safety by Optimizing Barcode Medication Administration Compliance

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PRACTICE GAP

Medication administration errors continue to be a significant cause of preventable patient harm in hospitals. Errors may occur during medication preparation, verification, and administration, resulting in adverse patient outcomes.

Barcode Medication Administration (BCMA) is already used in many hospitals to improve medication safety. However, medication errors can still occur when barcode scanning is bypassed, equipment is unavailable, barcodes do not scan correctly, or nurses develop workarounds because of workflow barriers.

This project focuses on improving BCMA compliance and reducing unsafe workarounds to decrease medication administration errors (Mulac et al., 2021; Guntschnig et al., 2025).

PICOT QUESTION

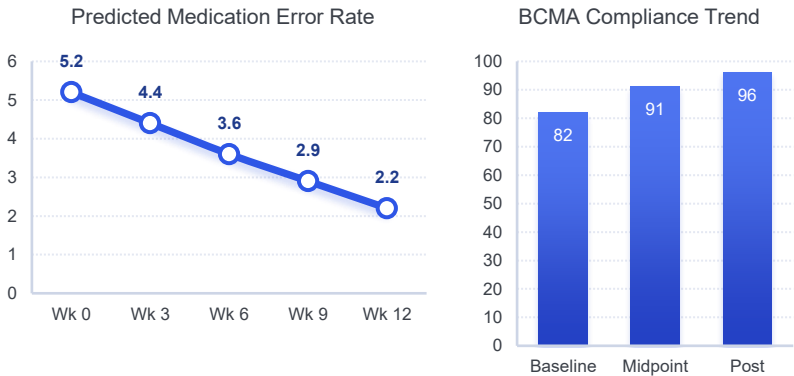
In hospitalized adult patients receiving medications, how does improving BCMA compliance through staff education, workflow support, and reduction of workarounds, compared with current BCMA practice, affect medication administration error rates over 6 months?

PROPOSED PRACTICE CHANGE

Optimize current BCMA practice by improving nurse compliance with barcode scanning and reducing workarounds (Grailey et al., 2023; Hogerwaard et al., 2023).

BCMA EVIDENCE GRAPH

Data Supporting PICOT: Optimizing BCMA Compliance to Reduce Medication Errors



Evidence synthesized from Mulac et al. (2021), Grailey et al. (2023), Tolley et al. (2022), and Tiu et al. (2025).

IMPLEMENTATION PLAN

Assessment: Review current medication error rates, BCMA scan compliance data, and common reasons nurses bypass scanning.

Education: Provide nurse education on BCMA best practices, risks of workarounds, and scanner troubleshooting.

Workflow Support: Ensure scanners are available, functioning, and accessible. Report and fix barcode or scanning issues quickly.

Compliance Monitoring: Audit BCMA scan rates, track medication errors, review incident reports, and gather nurse feedback.

Process Improvement: Use staff feedback and audit results to reduce barriers, improve workflow, and reinforce safe scanning practices (Grailey et al., 2023; Hogerwaard et al., 2023; Blijleven et al., 2022).

EVIDENCE HIGHLIGHTS

Digital medication safety technologies reduce medication errors and adverse drug events.

BCMA supports safe medication administration by verifying the patient and medication before the medication reaches the patient.

Workarounds reduce the effectiveness of BCMA and may increase patient safety risks.

Common barriers include scanner malfunctions, poor barcode placement, alert fatigue, time pressure, equipment availability, and workflow interruptions.

Staff education, leadership support, reliable equipment, and ongoing compliance monitoring improve safe BCMA use (Insani et al., 2025; Mulac et al., 2021; Grailey et al., 2023; Tolley et al., 2022).

EVALUATION MEASURES

Primary outcome: Medication administration error rate.

Secondary outcomes: BCMA scan compliance rate, number of workarounds, adverse drug events, scanner issue reports, nurse satisfaction, incident reports, and quality improvement audit results (Hogerwaard et al., 2023; Tolley et al., 2022).

NURSING IMPLICATIONS

Nurses are the final safety checkpoint before medication reaches the patient. Consistent BCMA use supports the rights of medication administration and helps prevent wrong patient, wrong medication, wrong dose, omission, and documentation-related errors (Mulac et al., 2021; Guntschnig et al., 2025).

CONCLUSION

BCMA is an effective medication safety tool, but its success depends on consistent use. Optimizing BCMA compliance through education, workflow support, reliable equipment, and reduction of workarounds can improve patient safety and reduce medication administration errors (Insani et al., 2025; Guntschnig et al., 2025; Grailey et al., 2023).

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