

Improved Barcode Scanning for Medication Administration with Mobile Devices Compared to Standalone Scanners

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Key Findings:

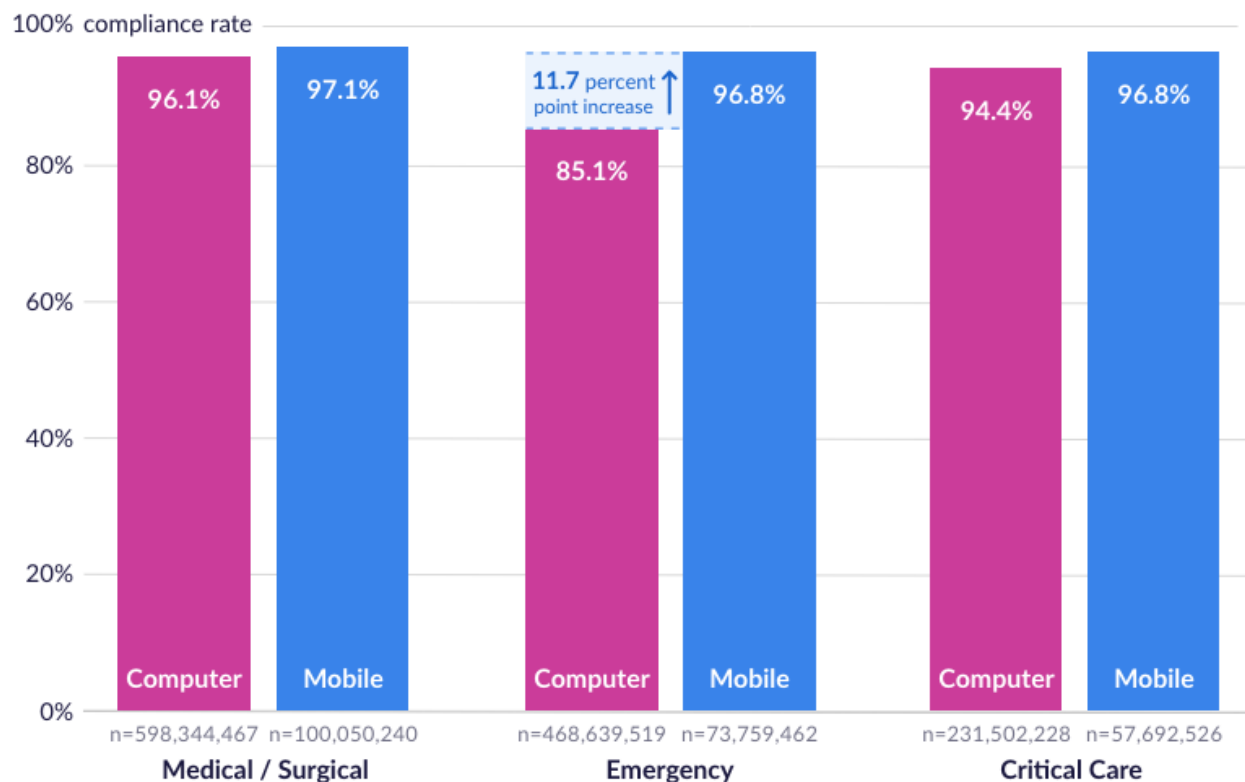
- Compliance with barcode scanning for medication administration (BCMA) is higher when using a mobile device for scanning compared to scanning with standalone barcode scanner devices.
- The greatest improvement in compliance rates is seen in emergency departments, where compliance rates are 11.7 percentage points higher for mobile administrations than administrations completed using standalone barcode scanners.

Barcode scanning for medication administration is an important step when administering medications to verify the correct patient and medication as well as avoid potentially dangerous errors.¹ Additionally, health systems are continually looking for ways to decrease hardware costs associated with procuring and maintaining needed devices, such as barcode scanners and additional workstations to support workflows and documentation needs.² One way groups are looking to innovate and potentially reduce hardware and maintenance costs is to use mobile devices, such as a mobile phone or tablet, with applications such as Epic's Rover, that can be carried with staff for documentation.²

To better understand how barcode scanning using a mobile device compares to traditional barcode scanning with a standalone device, we evaluated the rates of barcoded medication administration compliance for medication administrations documented using a mobile device in Rover and medication administrations completed using Hyperspace, Epic's desktop application, which would use a standalone scanner. We studied 1.3 billion medication administrations completed using a computer and 232 million medication administrations completed using a mobile device between January 2021 and May 2024. We controlled for the department specialty where the medication administration occurred.

We found that compliance with BCMA was consistently higher when the medication administration was completed with a mobile device compared to medication administrations completed using a computer, as shown in Figure 1. Notably, the improved compliance rate with mobile documentation was greatest in emergency departments, which typically have lower compliance rates due to the emergent nature of care delivered in those settings. Barcoded medication administration compliance was 11.7 percentage points greater when medication administrations were completed using a mobile device in emergency departments, with an average 96.8% compliance for mobile device administrations compared to 85.1% of administrations completed using a computer. Medical/surgical and critical or intensive care departments showed smaller increases in compliance rates for mobile medication administrations.

BCMA Compliance Rates by Documentation Method



"BCMA Compliance Rates by Documentation Method," 2024. EpicResearch.org

Figure 1. Average barcoded medication administration compliance rates for medications given by specialty from January 2021 to May 2024.

These findings suggest that mobile devices capable of barcode scanning may improve BCMA rates, preventing additional potential medication administration errors.

These data come from summarized metrics of organizations that use the Epic EHR to document medication administrations. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Cathy Zhang.

References

1. Thompson KM, Swanson KM, Cox DL, et al. Implementation of Bar-Code Medication Administration to Reduce Patient Harm. *Mayo Clin Proc Innov Qual Outcomes*. 2018;2(4):342-351. Published 2018 Nov 26. doi:10.1016/j.mayocpiqo.2018.09.001
2. The Future of Healthcare: 2022 Hospital Vision Study. Zebra. [The Future of Healthcare: 2022 Hospital Vision Study \(zebra.com\)](https://www.zebra.com/resources/whitepapers/the-future-of-healthcare-2022-hospital-vision-study/). Accessed on June 26, 2024.

Data Definitions

Term	Definition
Study period	1/1/2021 to 5/31/2024
Study population	All patients with a medication administration scan required during the study period. Only scans with no automated dispense system (ADS) override indicated were included.

Outcomes	Compliance rate: patients scanned / patients requiring medication administration scan
Stratifications	Department specialty: Medical/Surgical, Emergency, Critical or Intensive Care

Table 1: BCMA Compliance Rates by Documentation Method

Specialty	Method	N	BMCA Compliance (%)
Med/Surg	Computer	598,344,467	96.1%
	Mobile	100,050,240	97.1%
ED	Computer	468,639,519	85.1%
	Mobile	73,759,462	96.8%
Critical Care	Computer	231,502,228	94.4%
	Mobile	57,692,526	96.8%