

A Multi-phase Study on the Development of a Pediatric High Alert Drugs Calculator Mobile Application (PMA) on Medication Errors In Neonatal and Pediatric Intensive Care Units



Thitininun Raknoo¹

Background

Dosage calculation errors involving high alert drugs are a significant cause of severe adverse drug events in pediatric and neonatal populations.

Objectives

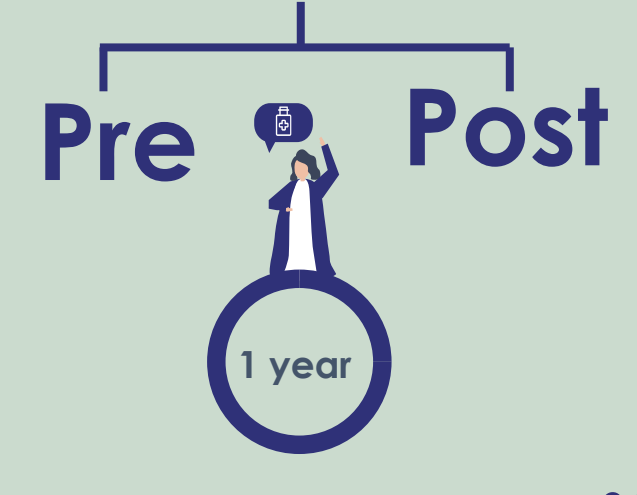
To develop Pediatric High Alert Drugs Calculator Mobile Application (PMA), a specialized mobile application engineered to ensure dosing accuracy and medication safety.

Methods

A multi-phase study was conducted

Phase 1: A retrospective cohort study of infants admitted to the NICU of a tertiary care hospital

The neonatal pharmacist participants on medication errors (ME)[#] ward-based settings



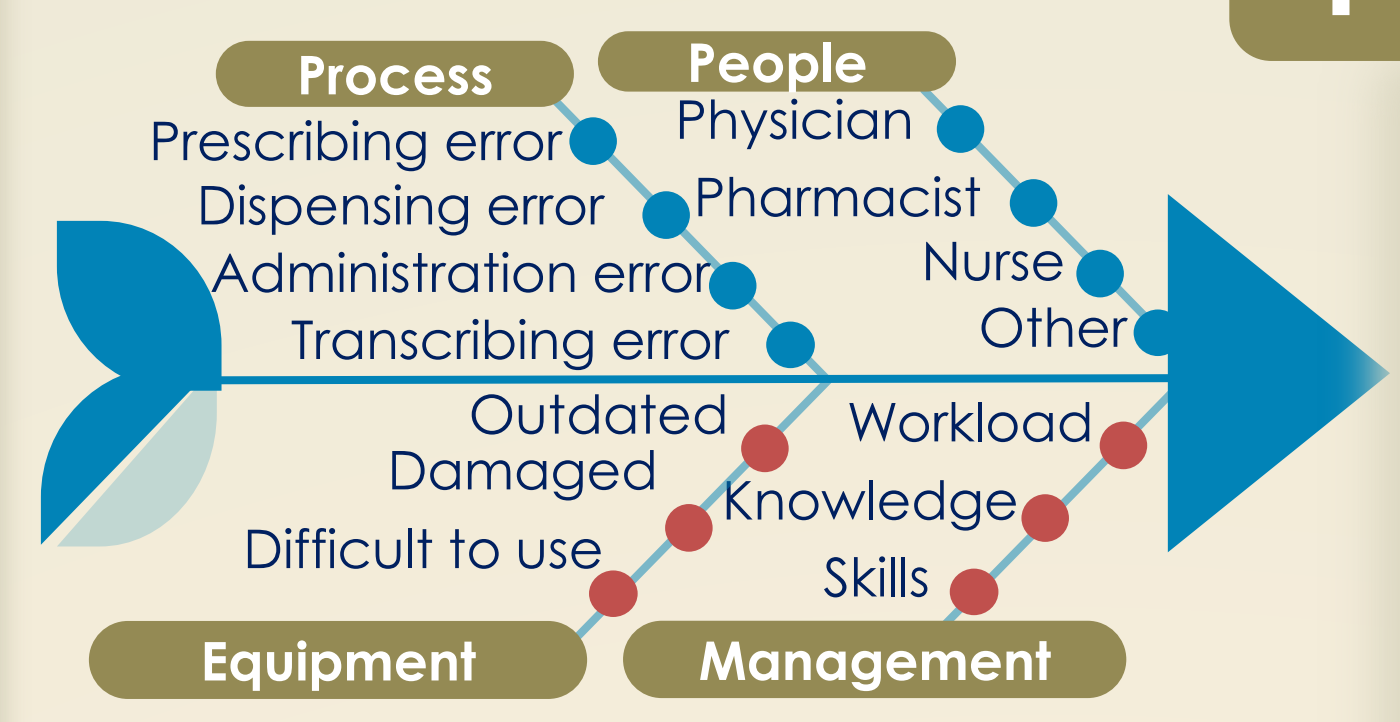
The incidence, severity, and type (95% CI) of ME were estimated for pre-post comparison

Phase 2: The empirical data and error patterns identified in Phase 1 served as the foundational evidence base for the architectural design and development of the PMA mobile application, Version 1.0

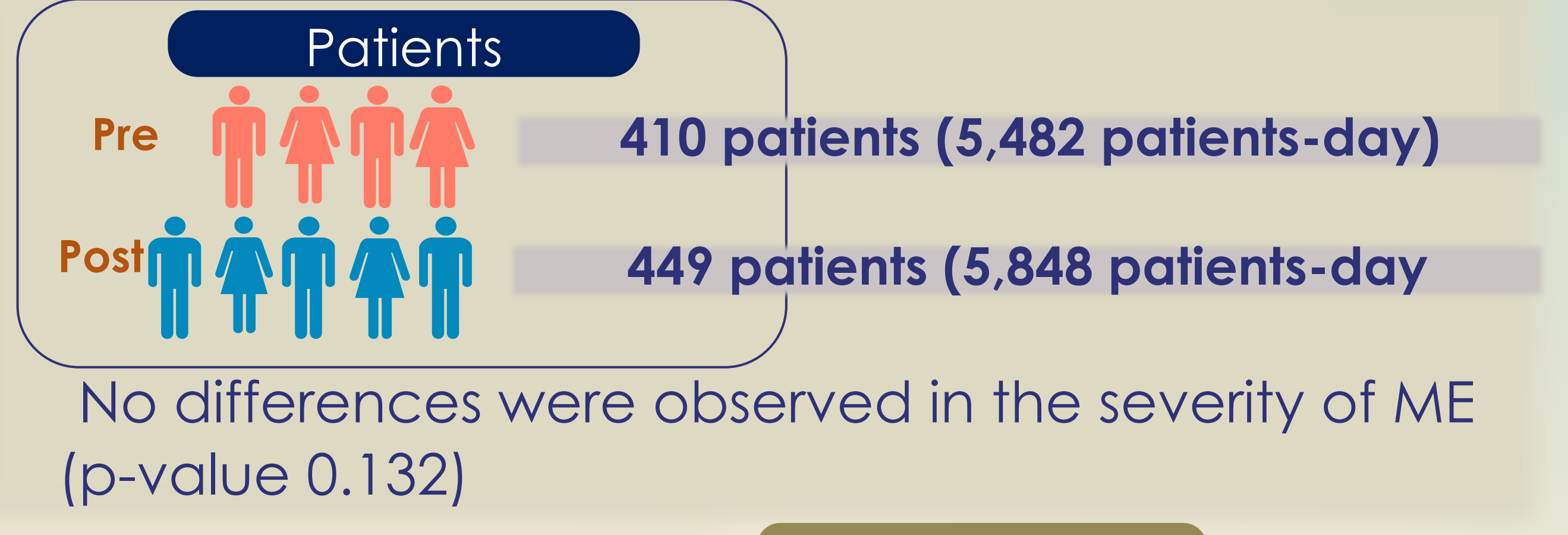
Phase 3: Implementation

Phase 4: A formal analysis of PMA Version 1.0's utility, adoption, and impact was conducted

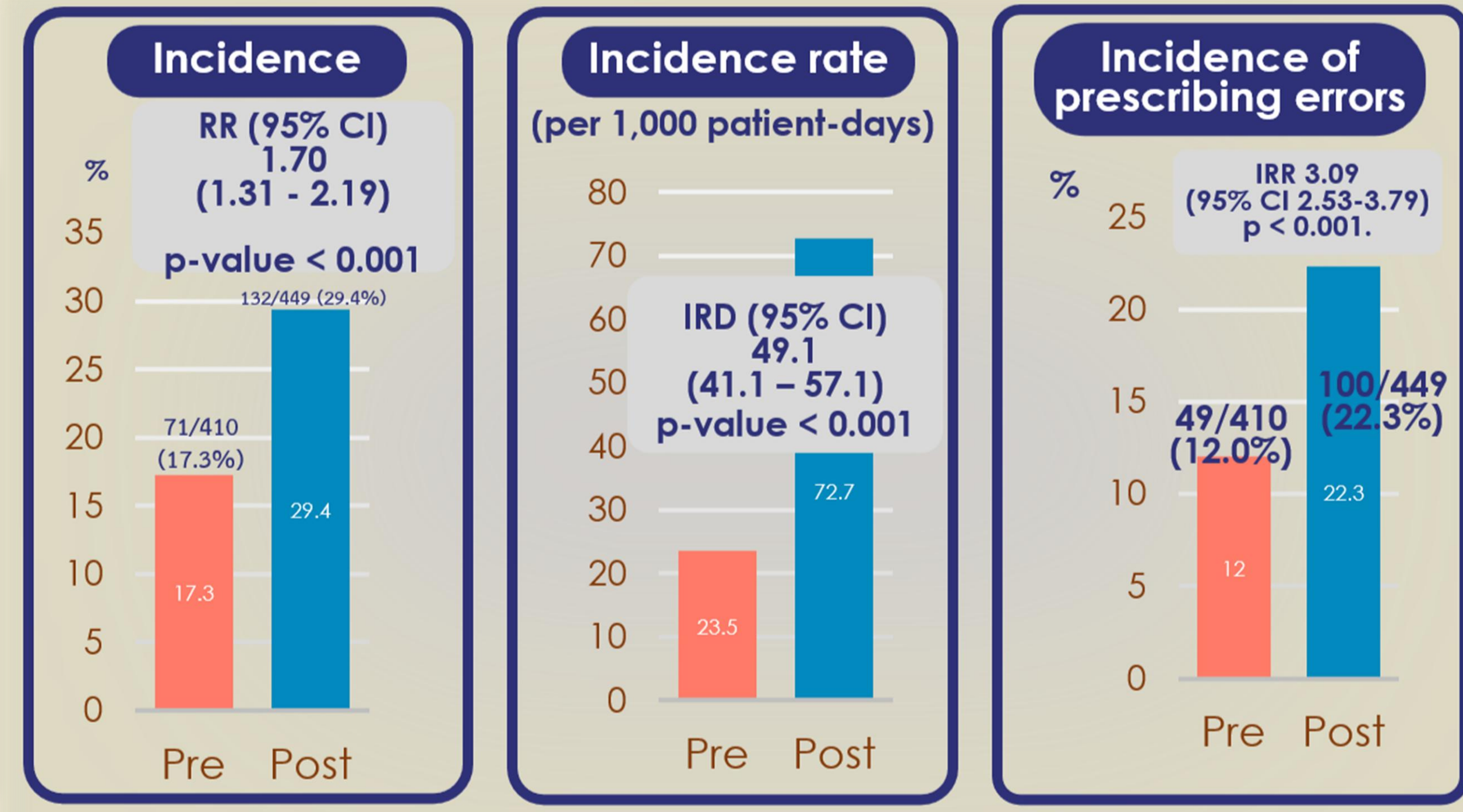
Phase 5: The strategic development of PMA Version 2.0, incorporating user feedback and additional functionalities



Phase 1:



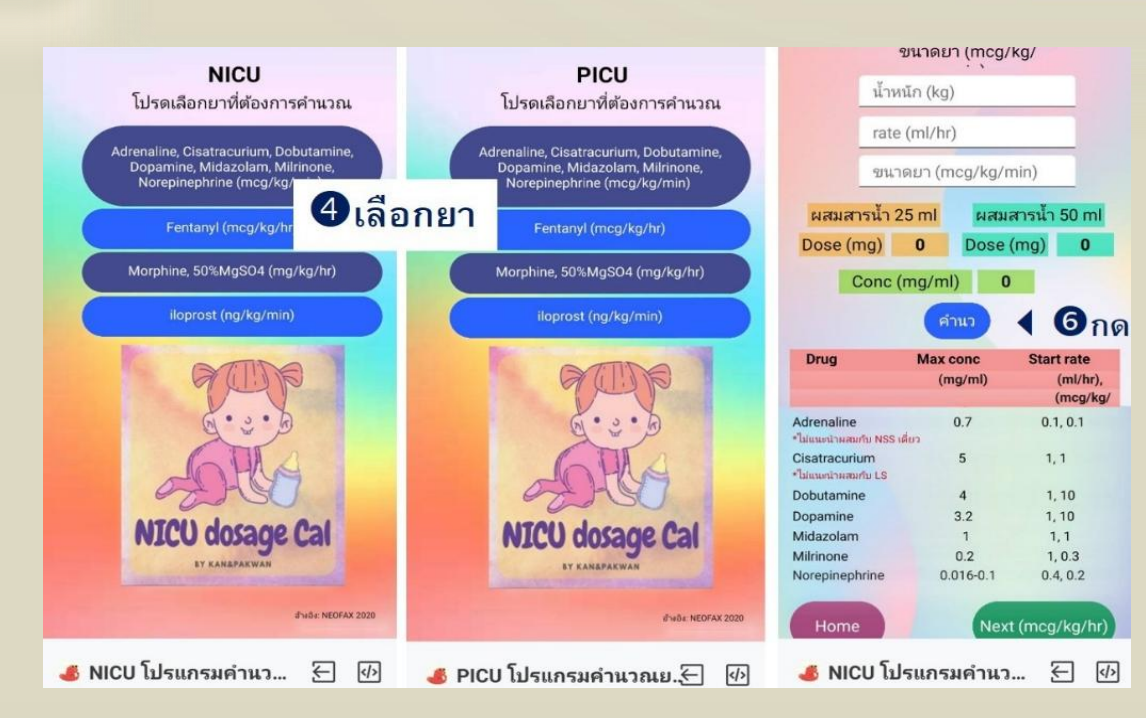
Results



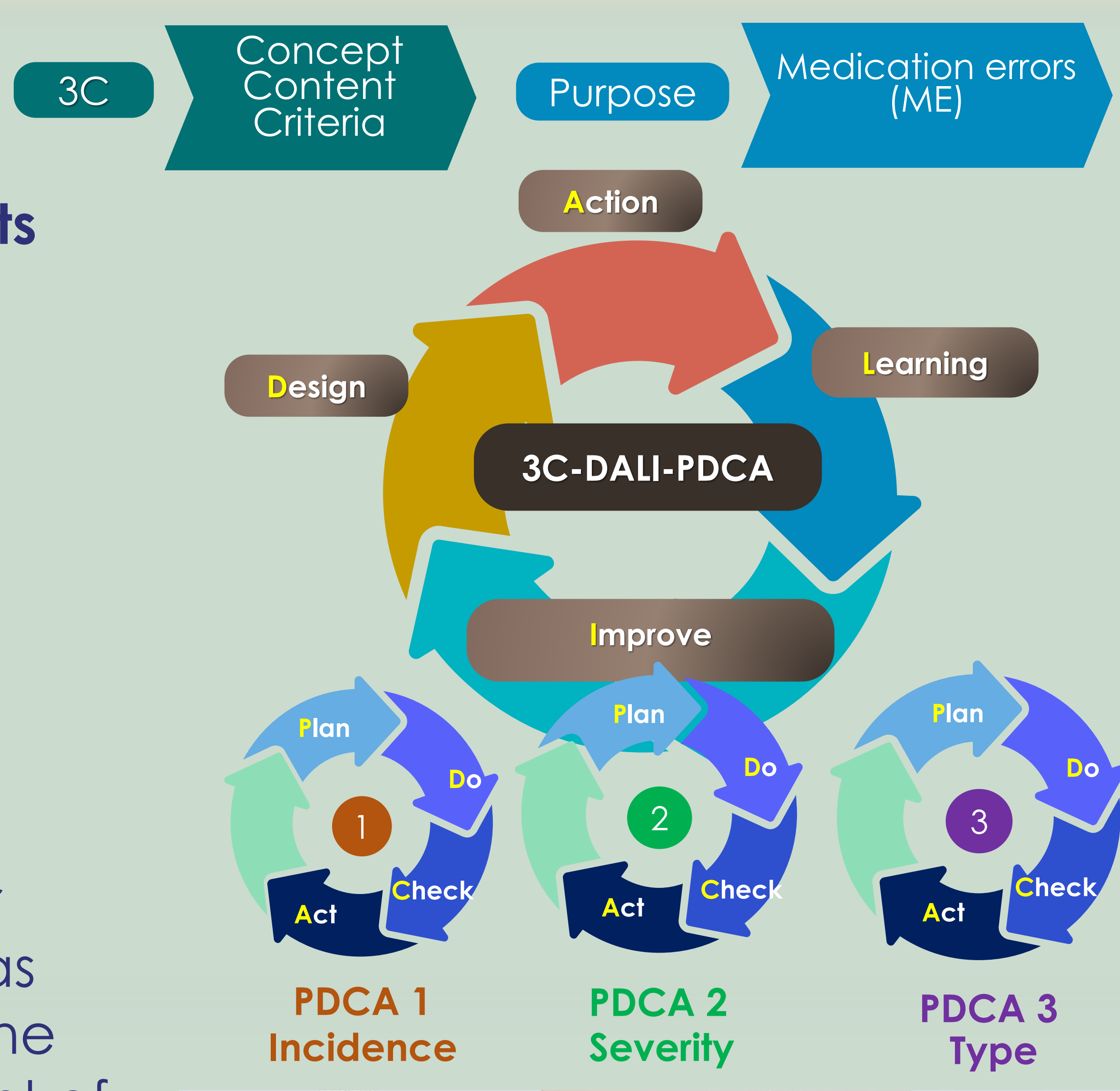
Phase 2-5:

The implementation of the PMA application yielded a profound reduction in its primary target: high alert medication dosage calculation errors decreased from 23.97% to 0.09%.

End-user satisfaction was exceptional, achieving a mean score of 4.7 on a 5-point Likert Scale, which is categorized as the "highest level" of satisfaction (criteria: 4.21-5.00).



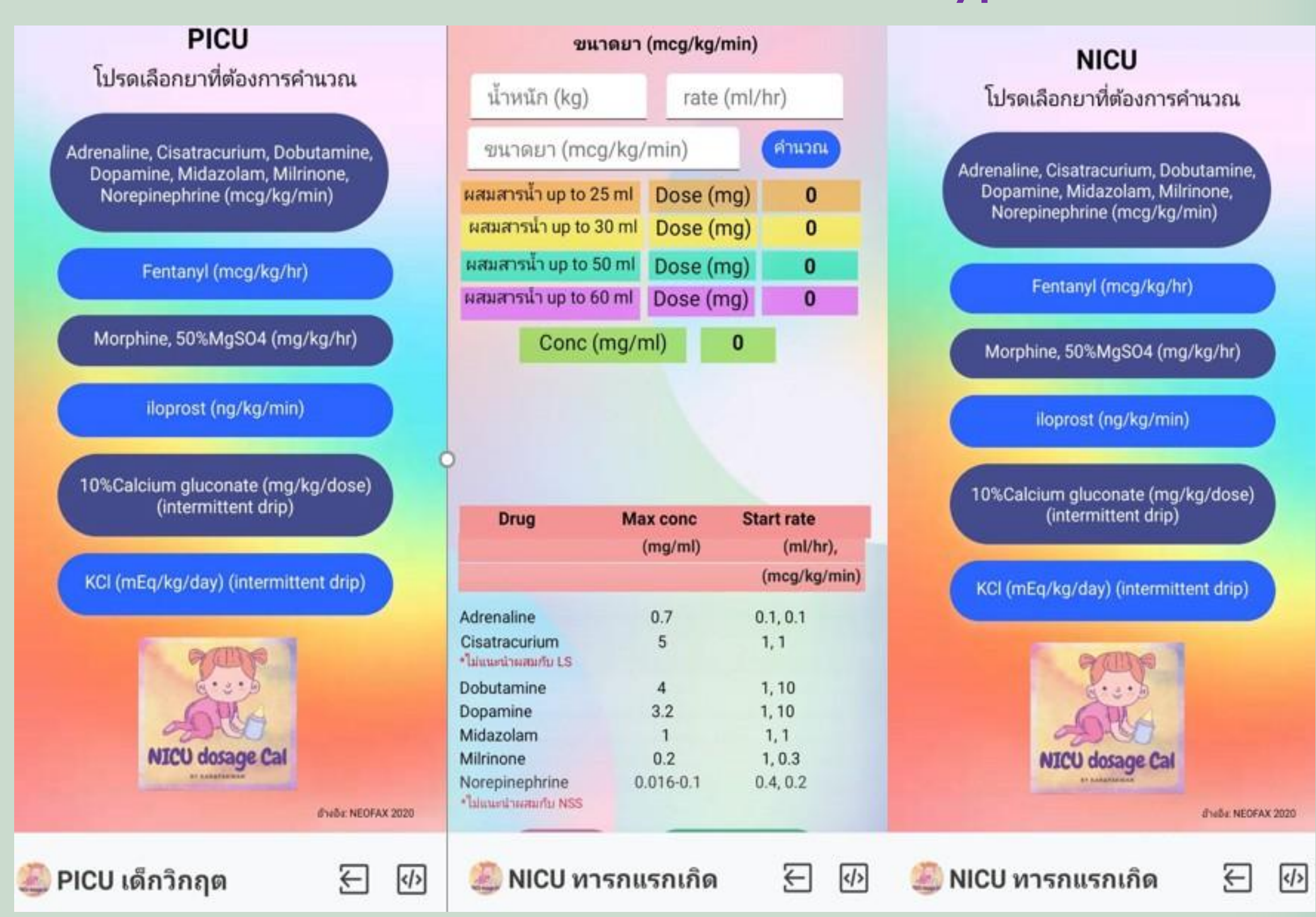
PMA mobile application (Version 1.0)



Conclusion

The PMA application has proven to be a useful clinical tool that directly enhances the core competencies of physicians, pharmacists, and nurses engaged in medication safety.

The advantage of a ward-based neonatal pharmacy is necessary to protect patients from harm and the consequences of ME.



PMA mobile application (Version 2.0)

[#] The National Coordinating Council for Medication Error Reporting and Prevention (NCC MERP) definition

