Simulation as a Development Tool in the Creation of an Electronic Medication Administration Record for the Emergency Department

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Introduction/Background

Emergency Department (ED) nursing care is frequently provided in a fast-paced, high-acuity environment. During a single visit it is not uncommon for a patient to receive a number of medications; these may also include medications considered to be high risk. EDs are often excluded from barcode medication administration (BCMA) system roll-outs because of the complexity and pace of patient care.[1] When the ED has been included, critical care scenarios are omitted due to the urgency of the situation and lack of medication orders prior to administration.[2]

Methods

The goal was to develop an electronic medication administration record (eMAR) that incorporated BCMA without disrupting the workflow in the emergency department. Initial development covered general medication administration scenarios; second phase development targeted critical event scenarios. We adapted a version of eMAR that was used in the Post-Anesthesia Care Unit; the critical event module required new development. We augmented standard development tools with simulation in the clinical space. Observation and mapping of ED medication administration workflows plus computerized testing with patient scenarios guided initial development. Multiple simulated critical event scenarios in the ED critical zone as well as rapid response events occurring elsewhere in the ED provided invaluable insight into how well the critical event module did or did not mesh into the ED workflow and identified additional hardware needs. These simulation scenarios included nurses, physicians, and technicians as actors with programmers and eMAR clinical team as observers.

Results

Workflow and ED eMAR that was developed based on patient test scenarios worked as expected for general use cases, but needed significant modification for critical event scenarios. Feedback from the simulation scenarios directed future program development and identified the need for additional equipment, workflow adjustments for documentation, and modifications to the ED version of provider order entry (POE) to support implementation. Following a six-month development process, BCMA went live in the ED for general use scenarios. Staff adoption is high, with 95.2% of all medication administrations documented via BCMA. Development continues on a critical event process, with implementation anticipated spring 2015.

Discussion

Simulation in the clinical area identified unanticipated gaps in the current system, workflow and equipment. Feedback from both simulation observers and participants was invaluable and provided insights that might not even be revealed until well into deployment. The ability to collect and incorporate end user feedback and suggestions is critical to end product development before live deployment. Staged implementation allows for early benefits while time is given to development of more complex functionality.

References

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