Solution Title

Improving Patient Safety Through Bar Code Medication Administration (BCMA)

Focus Area: Information technology and medication safety

Program/Project Description, including Goals

BCMA is becoming the standard for medication administration throughout the country. Few organizations within the Baltimore area use BCMA during medication administration to minimize the risk of delivering the wrong drug, to the wrong patient, at the wrong time, via the wrong route, with the wrong dose. Implementing BCMA placed Sinai Hospital of Baltimore at the forefront of this technology in the Baltimore area and provided a closed loop medication process to the patients that the hospital serves. A closed loop medication process is one that involves the automation of medication ordering, dispensing, and administration. The closed loop medication process helps to assure that the right patient gets the right drug, with the right dose, at the right time, via the right route.

The goals for this project were to: 1) implement BCMA and complete the closed loop medication process to enhance patient safety, 2) Enhance nursing practice by improving medication administration accuracy and documentation, reducing medication errors, and supporting the five rights of medication administration, and 3) Develop a system that is synergistic with the workflow of the nurse.

Reported medication errors were identified as the metric to determine if BCMA was achieving the goals. The reported medication errors from January through March 2012 were used as baseline data for this project. During this three month period, there were 24 reported medication errors. These errors consisted of wrong drug, wrong dose, wrong patient, wrong time or a charting error on the electronic medication administration record. All of these errors could have possibly been avoided if BCMA was implemented.

Process

The process for designing the BCMA system began with the development of a multidisciplinary team. The team consisted of direct care nurses, clinical nurse specialists, nurse managers, pharmacy, education, and information systems. A project structure was designed so that individuals participating on the team and other members of the organization understood the lines of communication. It was critical that end users (staff nurses) were involved with the project since the implementation and sustainability of the technology would impact their workflow the most. Staff nurses were involved in constructing workflow diagrams of the current process of medication administration and the future state. They were also involved in a
device fair where different medication scanners were demonstrated. From this fair, the scanner was selected. Once the design of the system was completed, a comprehensive class was developed. All staff was required to attend one of the two hour sessions to become familiar with the new process of medication administration and documentation.

**Solution**

The solution to improve patient safety related to medication administration was the development and implementation of a BCMA system that integrated with the organization's electronic health record.

To develop and implement this system a series of steps were completed. The first step was a workflow assessment. During this step, the workflow of the nurse in administering a medication was outlined in detail. After the current state was documented the future state was outlined. The future state helped to clarify how nursing practice would change based on the BCMA technology. The second step was designing the system. The workflows were incorporated into the design sessions and key process changes were highlighted. During the third step, information systems took the design decisions and built the BCMA system in a test environment within the electronic health record. Once the system was built, functional, integration, and performance testing was completed to make sure the system worked as designed and integrated with the other components of the electronic health record. Training was the next step in the process. All direct care nurses attended the two hour course which was developed by the E-Learning and Education Resource Departments. The final step of the process was the conversion to the new system.

The organization used a staggered approach to implementation. Units with similar patient acuities (critical, intermediate, acute) were grouped together and converted to the new system. The staggered approach required fewer resources for support during the implementation phase. The final segment converted to BCMA in June of 2012.

**Measurable Outcomes**

Since implementing BCMA in April 2012, the organization has experienced a 75% reduction in reported medication errors (Figure 1).
Sustainability

The organization tracks reported medication errors on a monthly basis. This process will continue to assure that quality patient safety outcomes related to medication administration are being maintained.

In addition to sharing the number of reported medication errors with staff, the unit compliance with performing BCMA is shared with staff monthly. Shortly after implementation, the organizational overall compliance with performing BCMA was 85%. In August 2013, the overall compliance had increased to 95%, indicating that the staff nurses were using the system as designed. The monthly compliance will continue to be monitored.

Role of Collaboration and Leadership

Collaboration and leadership were critical for the success of this solution. The multidisciplinary team formed the building blocks for the BCMA system to be successful. The organization supported this solution through funding the project and providing business time for the staff to participate in the design and implementation.

Innovation
BCMA technology is new to this part of the country. Because it is new, adoption of the technology to improve patient safety is innovative.

This technology has unique attributes. First, the system integrates with the electronic health record and is not a separate stand-alone system. Second, the scanner that is used during the process is wireless which allows the nurse to maneuver around the patient room without being tied to a computer with a wire. Third, the nurse immediately knows whether the medication that is being administered is the right drug, for the right patient, with the right dose, being given at the right time, via the right route.