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Evidence based order sets: An effective solution to the complex challenge of improving patient care and safety

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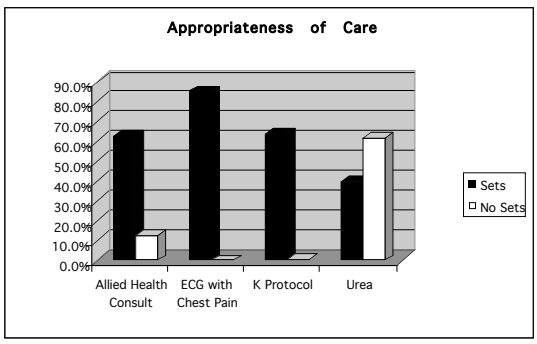
Objective:
The order set initiative was undertaken to begin the process of incorporating clinical decision support into the care process in a paper environment and prepare for the eventual implementation of computerized physician order entry (CPOE).

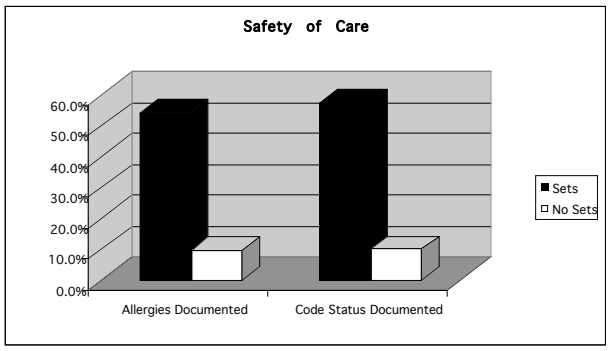
Methods:
Trillium Health Care Center (Trillium) is a 750 bed community hospital in Mississauga. Trillium uses a paper based order system and is planning migration to CPOE in two years. A project to implement standardized evidence based order sets across the enterprise was begun 18 months ago. This was initiated by mmoving away from traditional hospital approval structures (P&T, MAC) for order sets and creating an order set committee (OSC). The OSC working in conjunction with Health System Core Teams was responsible for overseeing the development, approval and implementation of order sets. This process was designed to be responsive to the needs of iterative order set improvement by minimizing the time to approve and modify order sets while improving order set quality. The OSC was multidisciplinary with nursing, pharmacy, laboratory, allied health, health records and physician representation.
The use of order sets was voluntary during this initiative.

Order sets developed included seven for medical patients including sets for COPD, Pneumonia and UTI. After four months the formatting and content of the medical order sets was improved in response to user feedback. A survey of nursing staff regarding the order sets was conducted.

A chart review (n= 291) comparing hand written orders and order sets for admission orders to the department of medicine from April to December 2004 assessed the effect of order sets on ordering potassium protocol, urea, allied health consults and a prn order for ECG's for chest pain post admission. Documentation of code status and allergy status was also assessed.
The numbers of order sets used over time was assessed.

Results:
Over 18 months 42 new order sets were created and 91 previous order sets were updated and stored in a web accessible data base. Time to develop, approve and implement a new order set was reduced to as little as one month. The use of order sets used to write admission orders for medical patients increased from 25% of all admission orders in the first four months after implementation to 55% after the improved formatting. Over 93% of nurses surveyed strongly agreed or agreed that order sets improved the quality and process of care while reducing the risk of transcription error and time to read orders compared to traditional free text orders. Increased documentation of allergies, code status improved with increased use of allied health consults, ECG with chest pain, potassium protocol with order sets. The ordering of urea was reduced (all results $p<0.01$).





Conclusions:
Changing the process of order set development, approval and implementation can enable a community hospital to create an enterprise wide order set infrastructure. This improved process can be used to incorporate user feedback into improved design and content of order sets enabling increased user adoption of order sets in a voluntary use environment. Order sets can improve the quality of care

delivered and the quality of documentation compared to traditional completely free text handwritten orders while improving workflow.

Order sets have been recognized as a critical enabling tool for the use of CPOE. It is hoped that the ability to use and develop order sets in a paper environment will facilitate the transition to a computerized order management system.