2010 Negley Awards for Excellence in Risk Management

Minimizing Medication Errors through the Implementation of an Electronic Clinical Record

LifeStream Behavioral Center, Winner of The Board of Directors' Award

Besides sexual misconduct and consumer injury or death through violent episodes or suicide, the most common reason for suit of a behavioral health center is medication errors. While law suits against providers of behavioral health lag behind general healthcare, the propensity for suit and the ever growing number of medications brought to market in the treatment of psychiatric disorders underscore the factors impacting the potential for such errors to hold significant liability exposure for our industry. An electronic clinical record holds new technology for LifeStream to address process control in our ongoing endeavors to reduce liability exposure to the organization.

Project Definition

During most of FY 08-09, LifeStream Behavioral Center developed and implemented an electronic clinical record (ECR). One distinct goal of the implementation was to reduce the number and scope of medication errors within our services. While a variety of medication administration and monitoring documentation strategies were being built into the electronic record system to reflect our complex and multi-level system of care, we chose to study our most intensive level of care due to the multiple prescribers, the volume of administrations, scope of medications prescribed on a daily basis and the number of nurses involved in the administration of medications to identify the impact on improved performance.

Our goals were well established and reflected our long-term commitment to performance improvement through data collection, trending, reporting through management levels and engaging in rapid cycle change efforts when necessary. The Assistant Director of Nursing (ADON) was selected as the Champion for Reducing Medication Errors and he chose to pursue reduction of three measures that had been operationalized in the previous year. These key indicators were:

Wrong Dose Error Rate would be <2%
Missed Dose Error Rate would be < 2%
Medication Variances would be < 3 per 1000 administrations

Implementation of the electronic clinical record was scheduled for the inpatient nursing staff to begin on January 5, 2009 and originally seen as a 30 day roll out period of daily monitoring of nursing performance in the electronic system while providing immediate feedback through clinical supervision and system education updates and refreshers by the ADON. Baseline data seen relative to the goals above was good and in fact better than industry standards as two of the three key indicators were meeting our expectations. We believed that the error rate could drop further with the system implementation thereby reducing the potential for treatment delays, injury and organizational liability within this important clinical domain. However implementation of the electronic clinical record resulted in unanticipated staff documentation difficulties during roll out.

Issues Addressed

Wrong Dose Error Rate: Medication amount given that is different from what the prescriber intended.

During January '09 our Wrong Dose Rate almost tripled from the base rate of 1.35 to 3.3 percent. Analysis of the "errors" being made by nursing staff strongly indicated that the issues were in staff being able to correctly select the milligram dosage when prescribers chose to deviate from a standard milligram dosage built into the system and when implementing a titration regime for the medication. Feedback from nursing staff and the ADON to the electronic record steering committee resulted in the rapid change methodology being used to make refinements to the dosage selection drop down menu. Monitoring of performance saw this indicator return to below threshold in February '09 with an error rate of zero percent. Since that time the error rate within this domain has remained at a much reduced rate which strongly suggests that the process has indeed become standardized. ***Monthly performance is demonstrated in the chart below.***

Missed Dose Error Rate - a medication dose that was not delivered to the intended recipient or delivered outside of the established time range posted for delivery.

In January, upon implementation, nursing staff appeared to have had good training as they seemed to understand the system of recording medication administration on the new electronic medication administration record (MAR). The documentation of Missed Dose Rate dropped significantly from the baseline of 2.41% to 1.8% and we were pleased with staff adherence to documentation refinements that the system allowed.

The primary advantages that the system achieved were increased legibility and a formal mechanism to verify that the medication dose was given within the acceptable time period established due to the computer time stamping the entry. However, it appeared that our transformation efforts were not finished when, in February '09 a new problem arose. Our Missed Dose Error Rate began to rise during the month.

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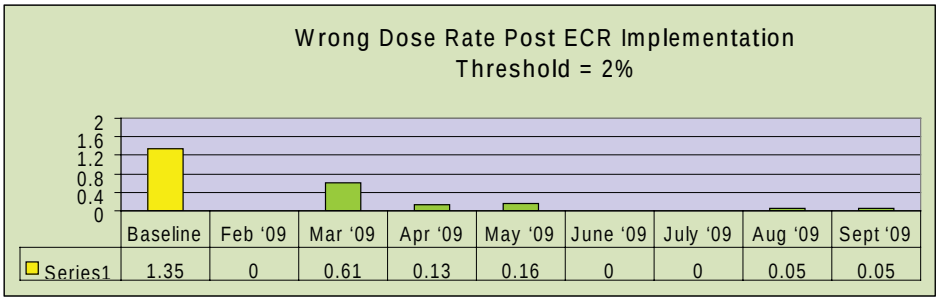
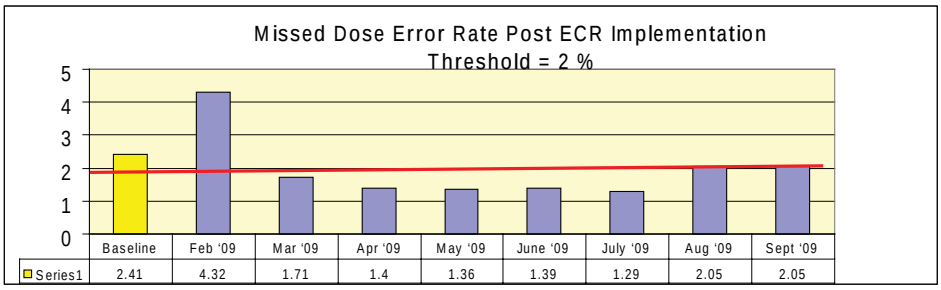




Through analysis of the errors it was noticed that while January demonstrated a very small number of procedural errors in working the system, one staff member was experiencing an expanding problem with closing the entry when recording a medication administration. Without closing the entry the electronic record would not accept the dosage as having been given in the acceptable time range for proper administration. When she or a supervisor next entered the electronic clinical record, he/she would then be prompted to "save" the entry. Of course closure at that time resulted in the system recording the time of the entry as the time that the document was saved. This late closure of entries resulted in a skyrocketing error rate.

The ADON jumped back into action and spent a great amount of time in supervision and education of the staff member during the remainder of the month. Unfortunately we had no other recording mechanism to discount the Missed Dose Rate for the month of February as recorded at 4.32%. However, after this aberrant month the figures then stabilized and the process appears to have begun to be standardized. ***See graph at top of this page for error rate through September of 2009.***

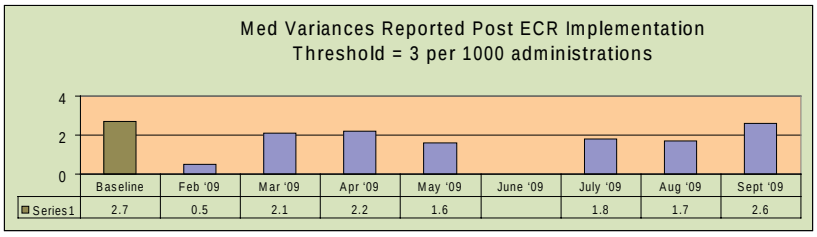
Continued analysis of this indicator shows that the computerized system cannot control two important variables in this domain. The first is reminding staff of each and every medication dose that is due. Although the inpatient facility previously implemented an almost universal once a day dosage schedule for psychotropic medications, other physical health meds create opportunities for staff to miss a scheduled dose. Staff tends to be less familiar with the range of medications that can be ordered for acute medical conditions as a large number are selected "off formulary". Also while not a rampant process error, there is an ongoing problem with staff forgetting to save the entry before logging out of the MAR. While the information is not lost it is relegated to "informal save" status and not time stamped into the system in a useful manner.

Because the staff performance had, until the previous two consecutive months, been trending down showing continued improvement and familiarity with the system requirements, efforts to implement system modification to this were not undertaken. Presently seen declining performance suggests that these system enhancements should now be elevated to priority level by the steering committee.

Medication Variances - all deviations between prescribed and administered medications other than missed dose or wrong dose.

In addition to focusing on nursing performance in the administration of medication we continued to look at other factors impacting medication utilization including route, wrong medication, inventory discrepancies related to narcotics, adverse drug reactions, pharmacy errors, and omissions. We expected some improvement to be seen primarily through the increased legibility of entries among the providers, transfer of information from the pharmacy to nursing, and across nursing staff within and across shifts. However, analysis of this larger collection of aspects has been non-conclusive. While beginning with a baseline of medication variances of 2.7 per 1000 administrations (an astonishingly low number), we saw a slight increase during the first month of the electronic record implementation and then a sharp decline to one half of an error per 1000 administrations - the lowest ever recorded in our history of tracking this indicator. Then within the month the rate returned to a more commonly seen rate and began to show a small consistent decline over a five month period, but in September climbed back to essentially our baseline level.

Analysis by the Pharmacy and Therapeutics (P&T) Committee suggests that a myriad of factors needs to be addressed in more detail for us to understand and then better control these dynamics. ***The table below demonstrates this process control variability.***



Conclusions

Our experience, measured over the eight months since implementation of our electronic clinical record, shows process control improvement in two specific medication administration domains and has brought these two aspects of medication administration to unprecedented 1evels of compliance. The documented Wrong Dose Error Rate declined by a factor often during the period and now stands at an average percentage of 0.125 compared to the baseline rate (collected over the previous 18 month period) of 1.35%. Missed Dose Error Rate also declined significantly from 2.41% to 1.6% in the same time period.

Although improvement was seen across all areas associated with medication variances, the third area of study was determined to have been too broad and multi-varied to respond to the limited controls brought to bear through our electronic recording system, and the P&T Committee is working to refine data reports that our ECR can collect through the aggregation of data.

Discussion

The host of initial reasons cited to implement a clinical record system did not prioritize attention to improving the control processes associated with medication errors. However, as we looked at our baseline data and our lack of process control that was evident, it became more apparent that we should expect some meaningful movement to be demonstrated through adoption of such a system. Our experience shows that this is a very productive area of process control in regards to select variables associated with medication errors, missed or wrong doses. When the specific aspects of medication variance are identified then the electronic record system can demonstrate significant improvement for factors associated with proper documentation. By incorporating an electronic MAR into the system staff can be trained in the recording process that enhances safety and treatment efficacy for the consumer while improving compliance and reduced liability for the organization in one area of expanding exposure. ❖

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