EXECUTIVE SUMMARY

Problem: Providence Health & Services established a "standard practice model" for pharmacy that included the systematic review of patient therapy on a daily basis. A program to automate some of the required functions to gather information and detect potential drug related problems was needed to help offset the increase in pharmacist resources needed to achieve the goals of compliance with key quality indicators.

Solution: A pilot hospital in the system implemented a clinical data surveillance application (Sentri7®).

Results: The hospital found a 500% increase in total interventions documented and a 1600% increase in cost savings attributable to those interventions. In addition, an 11% increase in intervention identification occurred in interventions where Sentri7 was the source of surveillance compared to manual surveillance.

Conclusion: The integration of Sentri7 into clinical pharmacy programs can have a positive impact on the quantity and quality of interventions being documented.

BACKGROUND

Providence St. Vincent Medical Center is a 523-bed, acute care, not-for-profit hospital located near Portland, Oregon. Providence St. Vincent Medical Center, Providence Health & Services largest Oregon hospital, is renowned for its many specialized programs, including Providence Heart and Vascular Institute, Oregon Medical Laser Center, Providence Multiple Sclerosis Center, and Providence Stroke — Gerry Migaki, RPh, Pharmacy Clinical Coordinator, Providence St. Vincent Medical Center “The use of Sentri7® clearly identified more patients that met each of the clinical initiatives set out by the pharmacy.” Center, among others. Its maternity services are highly regarded throughout Oregon, with about 1 in 8 babies born each year at Providence St. Vincent Medical Center, more than any other medical facility in the state. The hospital has over 4,000 employees and has an affiliated medical staff of over 1,700 doctors.

“The use of Sentri7® clearly identified more patients that met each of the clinical initiatives set out by the pharmacy.”

– Gerry Migaki, RPh, Pharmacy Clinical Coordinator, Providence St. Vincent Medical Center

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Providence St. Vincent Medical Center has more than 41,000 admissions per year with an average daily census of 390. The average length of stay is approximately 4.3 days. ER visits exceed 80,000 per year.

PHARMACY

St. Vincent’s pharmacy has approximately 40 FTE pharmacists which includes management. The pharmacy model is centralized order entry with clinical pharmacist coverage on most units. They use a Pyxis Connect system for order delivery to the pharmacy from the nursing units. Orders are then entered into McKesson’s Horizon Meds Manager (HMM) system in the central pharmacy. If problems are found, the issue is communicated to the clinical pharmacist by phone for follow up. Starting in July, issues will be entered directly into Quantifi for follow up by the clinical staff on the unit with only emergent calls being needed. There are three satellite pharmacies that perform mixed order entry and clinical functions (NICU, Critical Care, and Oncology). Providence St. Vincent implemented Quantifi in March of 2007. Sentri7 was implemented in a single pilot clinical area in March of 2008 and was rolled out house-wide later in the year.

PRE-SENTRI7 AND QUANTIFI CLINICAL PROGRAMS

Prior to Sentri7 and Quantifi, clinical issues were identified in one of three ways: target drug programs, profile review and order processing. Target drug programs were in place for certain high cost/high risk drugs. These included IV/PO opportunity drugs, drugs requiring renal dose adjustment and high risk medications.

Target medications included:

- Warfarin
- Epoetin
- Digoxin
- Metformin
- Vancomycin, Gentamicin, Tobramycin

Lists of patients on these medications were generated from HMM daily in the morning for pharmacist follow up.

A second method of identifying clinical issues was direct manual medication profile review. Profile review necessitates a pharmacist pull up a copy of the patient’s medication list and analyze their medications, labs and demographic information looking for situations where drug doses might need to be modified to better meet patient parameters.

Examples include:

- Potassium-Diuretic-Serum potassium level monitoring
- Metformin usage
- Drug induced thrombocytopenia
- Glycoprotein 2b/3a inhibitors
- Clozapine use
- Nesiritide use
DISCUSSION

Sentri7 Impact on Overall Intervention Documentation The implementation of Sentri7 has had a very large impact on the number of documented interventions in the Cardiology satellite pharmacy at Providence St. Vincent Medical Center. There are a number of factors in this study that warrant further investigation. First of all, it should be apparent that the numbers presented were not adjusted for workload during the study period. During a follow up phone call with Gerry Migaki, Pharmacy Clinical Coordinator at Providence St. Vincent Medical Center, he indicated that the average census during the pre- and post-study periods was relatively even and would not have impacted these results. The specific reasons for the large increase in intervention rates were not identified, but Migaki also surmised that much of the increase in intervention rates was due to a number of factors including:

- Sentri7 speeds and simplifies documentation in Quantifi by pre-populating the Quantifi documentation forms with relevant data making it easier for pharmacists to document.

PRE- AND POSTIMPLEMENTATION SENTRI7 PILOT STUDY

Providence St. Vincent Medical Center was unique in that it was a pilot site for the Providence Health & Services system. As such, it performed a pre- and post-Sentri7 implementation study to evaluate the impact of this tool in their institution prior to purchase of the application by the entire system. The pilot analyzed two 6-week periods of time and compared the number of interventions documented and cost savings related to those interventions prior to the implementation of Sentri7 and post implementation. This pilot was performed in the Cardiology satellite pharmacy from January- April, 2008. These key results were presented at Western States Conference in Pacific Grove, California - May 20-23, 2008 (1).

RESULTS

The baseline intervention rate during the pre-implementation phase for all intervention types was 23.8 +/- 12.5 interventions per week for a total weekly cost savings of $1292.* The post Sentri7 implementation intervention rate was an astounding 122.7 +/- 56 interventions per week for a total weekly cost savings of $20,800. This amounts to a 500% increase in the total number of documented interventions done and a 1600% increase in terms of dollars.

The secondary objective of evaluating the pharmacists perceptions of the amount of time saved was based on a 60% response rate to a survey and found that most reported neutral to improved time savings. The preventable ADE rate analysis was still pending at the writing of this case study.

IMPLEMENTATION

Baseline intervention numbers were gathered in the six weeks prior to go-live of Sentri7 in the Cardiology satellite pharmacy. During this phase, a task force was set up to initiate all of the manual target drug programs as lists in Sentri7. The cardiology pharmacists were given one week of training in the use of Sentri7 prior to initiating phase 2 of the pilot.

OBJECTIVES

The primary objective for this pilot was to measure the number of documented interventions in Quantifi post implementation of Sentri7 and compare them to historical data. Secondary objectives included assessing time impact for medication review (based on a pharmacist survey), determining the number of preventable ADEs identified and assessing the cost savings of interventions documented.

CASE STUDY

Gerry Migaki, RPh, Pharmacy Clinical Coordinator, Providence St. Vincent Medical Center

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• Sentri7’s ability to identify intervention opportunities that potentially would have been missed during manual review led to more interventions being identified and followed up on (discussed in more detail below).

• The use of Sentri7 focused the pharmacist’s attention on the value of clinical documentation and stimulated them to document events that they didn’t document in the weeks prior to the study.

• The disparity between the numerical percentage increase and the dollar percentage increase indicates that there was a disproportionate increase in the types of interventions being done, leaning toward the documentation of more valuable interventions in the post-Sentri7 phase of the pilot.

Sentri7 Impact on Intervention Surveillance
Migaki noted another aspect of Sentri7 implementation that was not an objective of the pre- and postimplementation study outlined above. The use of Sentri7 clearly identified more patients that met each of the clinical initiatives set out by the pharmacy.

That is to say, Sentri7 did “a more complete job” of identifying all patients that met a certain set of clinical parameters that warranted pharmacist intervention. Specifically, the surveillance and identification of certain interventions (for example, warfarin monitoring, CMS Core Measure: AMI adherence, and Renal Dosing interventions) were compared to the surveillance and identification of interventions using strictly manual systems and saw increases in intervention identification rates of 11%. These were not “false positives” (which could be eliminated by fine tuning the list logic in Sentri7), but cases of patients that may have fallen through the cracks in a manual review system. The takeaway here is that Sentri7 more completely identifies patients within any clinical initiative. It is important to evaluate the capacity of your pharmacy team to perform these activities in light of 100% identification of patients that meet the criteria of a clinical issue.

Overall this study is suggestive that the integration of Sentri7 into clinical pharmacy programs can have a positive impact on the quantity and quality of interventions being documented in a Cardiology pharmacy satellite. In addition, the integration of Sentri7 identified 11% more intervention opportunities than were identified due to manual review alone.
CONCLUSION

This case study highlights a residency research project at Providence St. Vincent Medical Center looking at the effects on documentation of interventions in Quantifi pre- and post- Sentri7 implementation in a Cardiology Pharmacy satellite in early 2008.

While the results are suggestively very positive, a more controlled and detailed study would be needed to determine the causes for these increases in documentation. This is indeed the plan. Based on this preliminary study, Providence Health & Services has chosen to move forward with the purchase of Sentri7 system-wide.

Migaki rolled out implementation of Sentri7 and Quantifi throughout Providence St. Vincent Medical Center over the summer of 2008 with household implementation in Q3 2008. At this time, he will undertake another validation study of Sentri7 and Quantifi use for publication.

FOLLOW UP

The Providence Health & Services system adopted Sentri7 at St. Vincent Medical Center as a pilot site to evaluate the program using pre-defined success criteria, before making the decision to implement the program in the rest of the 26-hospital system.

“Sentri7 was selected due to the unique approach of providing an efficient and effective method for screening the alerts and developing a work list of only those that warranted follow up,” said Steve Pickette, System Manager of Pharmacy Clinical Services for Providence Health & Services. “We also had a very good history with Pharmacy OneSource in the implementation and use of the Quantifi documentation tool.”

The criteria that were established for evaluating the pilot were:

- 100% accuracy of information as verified by comparison to reports generated by the hospital information system.
- At least 25% of interventions documented originated from the Sentri7 program in categories related to the alerts.
- An overall 10% increase in the number of interventions documented.
- An average score of 4 or greater on a scale of 1-5 on evaluation of Sentri7 from the user standpoint.

The pilot was very successful and met or exceeded all of the criteria. Providence also evaluated the resources required to implement the program at the pilot site in order to develop an accurate estimate of what would be needed for the rest of the system. The resources needed to implement the program were very minimal, especially relative to the impact of the program, with approximately 150 hours total needed, including interface setup and training.

There have been no significant PH&S resources needed to support Sentri7 at the pilot site during the first six months of use. The Sentri7 initiative was approved and Sentri7 has been implemented in all facilities in all four regions of the PH&S system.

REFERENCES

1 Implementation of a Web-based Rules Program to Facilitate Pharmacist Identification of Medication-related Problems: Hankins, Cynthia - Presentation #442 - Presented at Western States Conference, May 22, 11:30 AM. Copy available upon request.