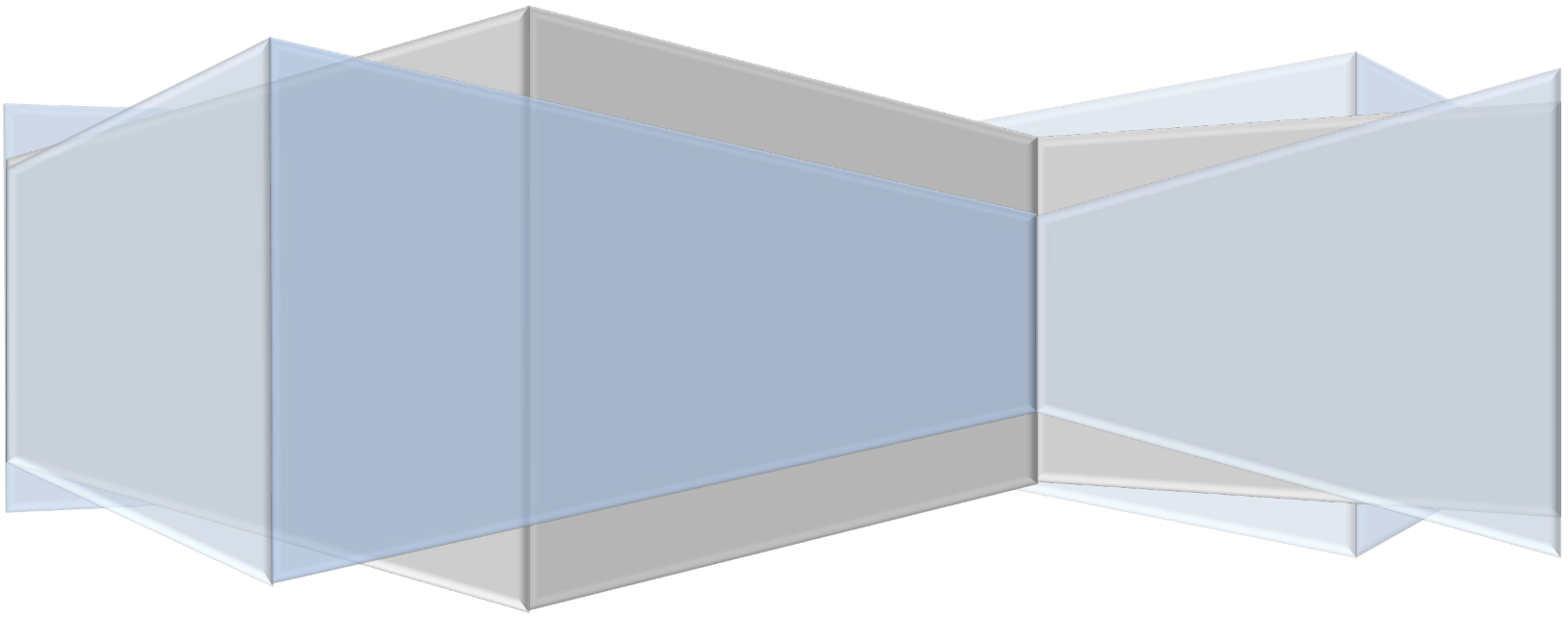
Great Plains Health
601 West Leota St
North Platte, NE 69101
Contact: Barb Petersen, CQO
petersenba@gphealth.org
308-568-8300 Phone/308-568-7468 Fax

NHA Quest for Excellence Award

Enhanced Analytics for Mitigation of Controlled Substance Diversion

Submitted August 4, 2020



The Quest for Excellence Award Application discusses the journey of Great Plains Health (GPH) in North Platte, Nebraska, to mitigate risk for diversion of controlled substances. We accomplished this goal by implementing interface analytics software (Bluesight®) to optimize reconciliation of medication transaction data from automated dispensing cabinets (Pyxis®) and documentation in the electronic medical record (Epic®).

Leadership/Planning

At Great Plains Health, senior leadership guides and sustains the organization by establishing the organizational mission, vision, values and performance expectations.

Our Mission- To inspire health and healing by putting patients first – always

Our Vision- To become the region's most trusted healthcare community

Our Values- We are genuine
We are passionate
We have integrity
We listen
We are a team

Our Strategic Objectives- To ensure access to quality care
To encourage innovation to improve patient care
To grow services to meet our region's needs
To stay true to our mission, vision, and values
To maintain the independence of healthcare in our region

GPH is privileged to have a strong senior leadership team with diverse healthcare backgrounds who champion continuous quality improvement. As part of the GPH strategic objectives to "encourage innovation" and "stay true to our mission" of "putting patients first – always," leaders formed a task force to identify proactive areas where GPH could lessen the

effects of the national "opioid crisis"[1] in our community. One significant idea that emerged from the task force's efforts was the need to optimize the "big data" related to the handling of controlled substances in the nursing and surgery units.

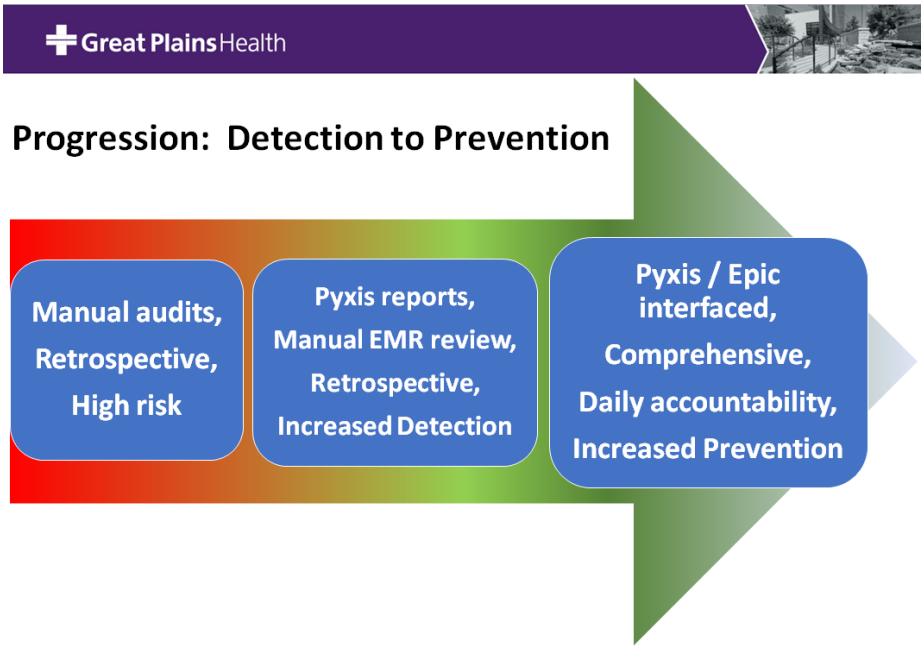
This "big data" consisted of the medication transactions – removal, return, and waste – recorded by automated dispensing cabinets (ADC) and the medication administration documentation in the electronic medical record (EMR). The GPH task force made a comparison of available commercial analytics software, with a focus on two objectives: 1- Automate the comprehensive reconciliation of Pyxis® and Epic® data; and, 2- Improve the timeliness of documentation.

After implementing our new EMR (Epic®) in April 2018, GPH needed a method to accurately analyze and audit all medication transactions. We proceeded to chart a timeline for rolling out the enhanced analytics software Bluesight® by March 2019. Interdisciplinary meetings with administration, physicians, nursing leadership, risk management, pharmacy, human resources leadership, quality, and information technology specialists, resulted in a plan to combine this technology with the accountability approach of our GPH Culture of Safety.

Process of Identifying Need

The GPH plan for enhancing analytics for mitigation of controlled substance diversion risk at the bedside became a logical step following our commitment to reducing the effects of the "opioid crisis"[1] in our community. Drug diversion in hospitals is a serious and urgent concern that requires immediate attention to mitigate harms to patients, health care workers, and the general public.[2,3] As a Joint Commission-accredited hospital, GPH seeks to evaluate

the effectiveness of our controlled substances medication management system and implement best practices.[4]



Pharmacy, Risk Management, and nursing leadership reviewed our past and current methods to identify gaps. The past state of diversion monitoring included manual, random audits, end of shift narcotic counts, no data to mine, and relied on staff co-workers to report their colleagues if they suspected drug diversion. The American Nurses Association estimates that as high as 10 percent of nursing staff may be at risk for diverting controlled substances and that as low as 0.3 percent are sanctioned by state boards.[1] A study done of 361 diversion incidents reported in the national news in 2017, showed that 41% of the cases involved nurses, 26% involved physicians, and 7% involved pharmacists.[5]

Because no institution is free from drug diversion risk,[5] GPH leadership was looking for improved practices to deter diversion. With only one individual terminated in recent years due

to alleged diversion, GPH administration saw a need for a more objective and comprehensive method for reducing diversion risk.

When GPH invested in Pyxis® automated dispensing cabinets (ADC) almost a decade ago, new reporting capabilities allowed tracking of transactions and standard deviations in behavior among users. Routine auditing consisted mostly of discrepancy review and manual reconciliation of medications removed via the override function and whether corresponding orders existed in the medical record. No consistent or comprehensive correlation with medication administration data was obtained; only limited manual chart reviews were performed in response to theft/diversion identified through other means.

Best practice consensus recommendations from the American Society of Health System Pharmacists recommends timely documentation of administration and waste,[6] a process that is best accomplished through interfaced analysis of both ADC and EMR data.[3] With these goals in mind, we formalized our approach using the Malcolm Baldridge ADLI/LeTCI[7] and PDSA tools.

Process Improvement Methods

The Baldridge factors to evaluate process and results:

APPROACH	Interdisciplinary collaboration (VP, MD, RN, RX, IT, Risk Management)	**LEVELS**	Base performance on: 1- percentage of transactions reconciled 2- timeliness of administration
DEPLOYMENT	Consistent accountability (incident reporting system ActionCue® with directors/managers accountable for follow-up)	**TRENDS**	Significant improvements made for both objectives: 100% of transactions reconciled >90% of medication documentation completed within 1 hour
LEARN	Housewide education (Policy / procedure updates; education on diversion risks,	**COMPARISONS**	Emerging / developing industry standard is use of automated interface and

	detection, and prevention; hardwired automated reconciliation)		reconciliation of all ADC/EMR controlled substances transactions[8]
INTEGRATE	Grounded in organizational strategic objectives	**INTEGRATION**	Results are reported through committee cascade

The PDSA Cycle for Learning and Improving:

PLAN	Objectives: Use analytic software to automate reconciliation of all controlled substance transactions in ADC/EMR. Use incident reporting and culture of safety / accountability to improve timeliness of administration/waste/return documentation.
DO	Interdisciplinary approach to implement software, policy/protocol changes, staff education.
STUDY	Track / trend results of: percent of transactions reconciled (automated and by pharmacy staff). Percentage of transactions / documentation completed within timeliness increments.
ACT	Sustain changes through consistent accountability, reporting of trends through committee cascade. The next incremental change identified and acted upon was to lower the dose alert thresholds for physician orders in the EMR for fentanyl, morphine, hydromorphone, and midazolam. These dose alerts were changed to mitigate risk for respiratory depression.[9]

As part of the Planning and Doing stages, the CNO, Risk Manager, and Pharmacy Director performed a Gemba Walk with front-line ICU nurses to determine obstacles to the new expectation of a 1-hour time limit from medication removal to ending documentation. Education needs were identified and addressed: nurses must assess patient's pain score prior to removing medications from the ADC; medications must be returned or wasted immediately if the patient refuses; and, nurses can improve timely documentation by taking a waste partner with them to the Pyxis® when removing meds so that waste is witnessed in real-time. In addition, wording changes were made to the Medication Administration Policy stating that the time frame for scheduled pain medications is "within 60 minutes of removal from medication dispensing system."[9] For as-needed or PRN pain medications, "administration and/or waste will be documented within 30 minutes of removal from medication dispensing system."[10]

Three months after implementing Bluesight® analytics software, we hosted a tour of the GPH Patient and Family Advisory Council on June 26, 2019, where the pharmacy director explained the hospital's medication management processes and safety measures taken to prevent drug diversion.

Results

Our plan overwhelmingly achieved the two explicit objectives: first, the analytic software automates reconciliation of all controlled substances ADC/EMR transactions and documentation. Variances are reviewed manually and submitted as incident reports. Total medication transactions audited increased exponentially from 832 in 2016 to 37,956 in 2019 with the new automation. Now, rather than relying on manual, random audits, the interfaced data provides 100% of transaction review, pinpointing all discrepancies that require manual follow-up review. Manual review is laser-focused on 100% of discrepancies instead of a random audit.

Due to consistent accountability and the capture rate of all discrepancies, the workload for manual reconciliation has become much more efficient and even decreased from 7.3% to 5.83%. Now, the pharmacy technician who reviews these discrepancies has more time to perform other internal auditing processes such as verifying pharmacy controlled substances invoices for double signatures, reconciliation of refills and restocking of controlled substances from the pharmacy's CII Safe® to the unit Pyxis® machines.

Second, there has been a marked reduction in the time between drug removal from the ADC and final documentation of medication administration / waste / return. Timely completion of documentation within 1 hour has improved from 83.3% at go-live in 2019 to 95.8% in July

2020, even reaching 100% two months. Documentation outside of the 1-hour window has consistently trended downward.

From an employee health / human resources perspective, the increased automation and scrutiny initially required an investment in multiple employee drug screens as staff improved compliance with a new level of accountability and expectations. The number of urine drug screens peaked at 43 in May 2019, and trended downward to 10 in July 2020. Ultimately, three employees were let go due to at-risk behavior and continued negligence in documentation.

Other results with varying degrees of correlation to our original objectives include: a reduction in agency nursing staff (2018 1.11%; 2019 1.15%; and 2020 YTD 1.06%); increased compliance with bedside barcode scanning (2018 92.3% to 2020 YTD 95.8%); and, decreased number of medication errors with potential to cause harm (355 in 2017 to 27 through April 2020). While our main goal was to mitigate controlled substance diversion risk, these additional results demonstrate an improved impact on patient safety.

Lessons Learned

- Accountability is crucial: C-suite and Nursing leadership must support responsiveness to incident reports. Plan on an initial rise in urine drug screen costs.
- Consider the FTE involvement. We already had a pharmacy technician assigned to perform daily manual audits of Pyxis® overrides and discrepancies. Now her time could be more efficiently directed to specific follow-ups that were not automatically reconciled.
- With the reduction in time needed for ADC/EMR reconciliation, the Pharmacy Technician was also tasked with internal auditing of controlled substances invoices.

- Optimize “big data” analytics. Ask questions. Work with vendors to add/improve functionality.
- Future functionality wish-list: reconciliation of pain score and med selection, automated closed-loop for non-controlled meds used in surgery, comparison of pain meds administered by shift (day vs night) per patient.

Replicability

- Replicability: Perform a gap analysis to see what technology is already in use (ie, ADC) and how current reports can be optimized. Many hospitals already use an outside vendor to analyze ADC data (RxAuditor®, Pandora®). Multiple software vendors also offer a variety of analytical tools that interface ADC and EMR data. We selected a cost effective solution that worked with our technology and met our specific objectives.
- Consider the opportunity cost and information gaps if not automated. A significant amount of time was being dedicated to manual audits, with very low outcomes and low confidence in drug diversion prevention.

Sustain the Gain

Per our PDSA, we will sustain positive results through consistent accountability, continued optimization of data analytics, and reporting results to the Medication Safety Committee, Pharmacy and Therapeutics Committee, Medical Executive Committee, and the board of director’s Quality Committee. In addition to meeting our goals for diversion risk mitigation, GPH realized additional patient safety results that will provide long-term benefits for our health care workers and our community.

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