Advancing Medication Delivery Systems in Healthcare Organizations: An Evidence-Based Practice Project

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Thank you to our colleagues and peers who added insights into the conversation as to the focus and depth of this project and the population it can impact.

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Healthcare systems in the United States have more than four hundred variations. Still, all have the same common goal to provide effective and efficient care delivery pathway**.** Priority is emphasized on those factors that can reach the patient directly, and secondary are those factors that influence the administration of that direct patient care.

The primary objective of this project team is to promote awareness in the healthcare community of opportunities for change using evidence-based practices in the medication administration process. Pope's Place, a pediatric and young adult group home, graciously agreed to participate in the opportunity for change in their medication administration process through collaboration and presentation of recommendations from this project team.

Problem Statement: Scope of Clinical Problem from a Global Perspective

Medication is an intervention controlled by the supply chain, influenced by the delivery system, and accountable to those who administer it. All factors to which the end user, the patient, is subjected to and not able to influence, other than to refuse taking it. Supply, delivery, and administration are all systems that can be tracked, measured, and adapted or adjusted as guided for specific desired outcomes. Medical errors, of which medication errors are the largest factor, are evidenced as the third leading cause of death in the United States (Rodziewicz, 2024). The leading cause of medication errors is due to medication administration, which accounts for 8%-25% of medication errors (MacDowell et al., 2021). On a global scale, more than 55% of hospitalized patients will experience medication administration errors (Tsegaye et al., 2020). Ensuring consistent access to medications is critical for the health and well-being of Pope's Place residents, medically fragile children, and young adults, especially given their reliance on strict

medication schedules and the evidence that medication errors can be more impactful in pediatric populations (author?, 2021). A review of internal data from Pope's Place shows a not insignificant trend in medication errors over recent months, particularly those related to unavailability at 41.7% of all medication errors. This presents an opportunity to better understand the underlying causes and prevent future occurrences.

Given the growing reliance on healthcare technology to improve patient outcomes, and the focus of this evidence-based project being Healthcare Informatics, the implementation of an automated medication reordering process as a timely and essential intervention will aim to revolve around the Pope's Place Electronic Health Record (EHR) or any other automated options that review of the evidence might uncover. Automation can enhance efficiency, reduce human error, and ensure that essential medications are available when needed (author?, 2019). Bar code scanning medication has proven to be an additional method for decreasing human error in medication administration (Rodziewicz, 2024). Evidencing a 36% reduction in medication administration errors using a bar-code scanning system, the Brigham and Women's Hospital, Department of Pharmacy, Boston, MA and Mount Auburn Hospital, Department of Pharmacy, Cambridge, MA, both offer recommendations for such automated systems such as medication bar-coding (Forni et al., 2009). Addressing this issue aligns with both national efforts to improve medication safety and reduce preventable harm, as evidenced over the last decade by a marked decrease in manual dispensing methods and a 48% increase in the implementation of automatic dispensing cabinets (ADC) in healthcare settings (author?, 2019), and global efforts such as the World Health Organization (WHO) which has medication without harm as one of its three key action areas in the Strategic Framework of the Global Patient Safety Challenge. A global effort in the reduction of medication-related events by 50% over the next five years (author?, 2017).

Significance of Clinical Problem at the Organizational Level

Pope's Place population includes individuals ranging between the ages of 2 and 17 years. Medication reordering is managed through a manual process, leading to frequent delays, medication unavailability, and administration errors and/or omissions, at the current state of 41.6% of all medication errors. Given that all children in this facility require strict adherence to medication schedules for chronic and complex medical conditions, these errors pose a serious risk to patient safety and treatment efficacy.

This issue has been recognized as a priority by the organization, as it directly impacts the quality of care, staff efficiency, and compliance with regulatory standards. The organizational collaboration with the UMary graduate nursing team in this evidence-based practice (EBP) project provides the opportunity for recommendations that align with the facility's goal of reducing medication errors and improving medication management processes. Transitioning to a change process recommendation that is evidence-based, the organization seeks to enhance accuracy, streamline workflow, and ensure timely access to essential medications, supporting patient safety and outcomes.

PICOT Question

In the perpetual environment of healthcare, there is a constant need for change, adaptation, realignment, and innovation. In being proactive, teams can be agents of change and collaborate, assess, and coalesce ideas into action with a structured, inquisitive style using the PICOT question as a base to move forward and implement evidence-based practices with the goal to improve healthcare delivery. PICOT broken down into segments as depicted in the following Table 1, defines: an identified problem, population, or patient (P) to address, engage, or affect; an intervention or implementation (I) to promote the best evidence based result or

outcome; a comparison (C) typically current state of the problem, population, or patient or all and desired state; the outcome (O) to achieve or move positively towards, noted by measuring impact or success of the intervention or implementation; and the time frame or when the desired outcome is to be achieved, reviewed, or measured for positive gain.

Table 1

PICOT Question

Component	Description
P(Population)	Nurses in healthcare systems
I(Intervention)	Automated medication reordering system
C(Comparison)	Manual medication reordering system
O(Outcome)	Medications errors related to unavailability
T(Time)	Three-month timeline

To guide efforts, this evidence-based project team developed the PICOT question as the statement: In healthcare facilities, how does implementing an automated medication reordering system, compared to manual processes, impact medication errors related to unavailability within a three-month period?

Purpose Statement

The purpose of this project is to evaluate and recommend, based on available evidence, an electronic based medication reordering process to Pope's Place providing an opportunity in reduction of medication errors related to delays and unavailability. This project aims to improve medication management by enhancing the accuracy and efficiency of reordering processes, ensuring that all prescribed medications are available when needed. Through this initiative, the

facility is provided with the opportunity to improve patient safety, ensure adherence to treatment plans, and support healthcare providers in delivering high-quality care.

Literature Review

Literature Search

To inform and support this Evidence-Based Practice (EBP) project, a comprehensive literature search was conducted to identify current evidence related to automated medication reordering systems and their impact on reducing medication errors caused by medication unavailability. The search was conducted using multiple electronic databases to ensure an inclusive review of relevant literature. The databases used included:

I. PubMed

II. CINAHL (Cumulative Index to Nursing and Allied Health Literature)

III. Cochrane Library

IV. Consensus

V. Up to date

(should be listed in list within the sentence or table and reference it)

Searches were performed between January and March 2025. Boolean operators (AND, OR) were used to combine keywords and narrow or broaden the search as appropriate. The following keywords and MeSH terms were used in various combinations:

VI. "automated medication reordering"

VII. "medication availability"

VIII. "medication errors"

IX. "medication inventory"

X. "clinical decision support"

XI. "health information technology"

XII. "pharmacy automation"

XIII. "electronic health records"

XIV. "medication management system"

To enhance the relevance and quality of the results, the following filters were applied:

XV. Publication Date: Limited to the past 10 years (2015–2025) to ensure current and applicable evidence.

XVI. Article Type: Peer-reviewed journal articles, systematic reviews, and clinical practice guidelines

Articles focusing on pediatric-only populations, and pediatric populations in residential group homes were scarce, and the search had to be broadened to include healthcare organizations and general populations.

To ensure comprehensive coverage of the topic, the reference lists of key articles were manually reviewed for additional relevant studies that may not have appeared in the original database search. This backward reference search revealed material with similar content as previously reviewed.

All selected articles were critically appraised, and criteria included study purpose, sample characteristics, design, validity of results, and relevance to the project topic. Systematic reviews were evaluated for transparency in methods, inclusion/exclusion criteria, and strength of conclusions. Findings from high- and moderate-quality studies were synthesized and integrated into the background and synthesis sections of the project.

Table 2
External Data of Medication Errors Related to Processes

Systems	Academic Search Ultimate	CONSENSUS	CINHAL
1. Manual	9	5	6
2. Electronic System	39	8	38
3. Pharmacy System	64	10	51
4. 1 and 2	48	13	44
5. 1 and 3	73	15	57
6. 2 and 3	83	18	89

Table 3

Matrix Grid

Reference Citation	Research Purpose	Study Design	Sample	Data Collection	Analysis	Strength Limitation	Joann Briggs Level of Evidence	Quality
Abraham, J., Galanter, W. L., Touchette, D., Xia, Y., Holzer, K. J., Leung, V., & Kannampallil, T. (2020). Risk factors associated with medication ordering errors. *Journal of the American Medical Informatics Association*, *28*(1), 86–94. https://doi.org/10.1093/jamia/ocaa264	Identify risk factors associated with medication ordering errors.	Observational study using CPOE void function.	1,074 voided orders from a 495-bed hospital over 16 months.	CPOE systems logs, clinician surveys, and interviews.	22% of ordering errors reached patients but did not cause harm. Errors were caused	Strengths: Identifies multiple risk factors. Limitation: Self-reported data could introd	Level III (Observational study)	Moderate

					by technology, cognitive, environmental, and social factors.	uce bias.		
Barnsteiner, J. H. (2008). *Medication reconciliation*. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. https://www.ncbi.nlm.nih.gov/books/NBK2648/	Examine medication reconciliation as a strategy to prevent errors.	Literature review and expert opinion.	Multiple hospital settings	Review of published evidence on medication reconciliation processes.	40% of medication errors occur due to poor reconciliation. Joint commission set standards for reconciliation.	Strengths: Synthesizes best practices. Limitation: No primary data collection.	Level V (Expert Opinion)	Moderate
Bates, D. W., Teich, J. M., Lee, J., Seger, D., Kuperman, G. J., Ma'Luf, N., Boyle, D., & Leape, L. (1999). The impact of	Evaluate impact of comp	Prospective time series	Patients in 3 medical	Medication errors were tracke	Medication errors were reduce	Strengths: Large sample,	Level III (Observational	High

computerized physician order entry on medication error prevention. *Journal of the American Medical Informatics Association*, *6*(4), 313–321. https://doi.org/10.1136/jamia.1999.00660313	uterized physician order entry (CPOE) on medication errors.	analysis.	units at a 700-bed hospital.	d pre- and post-CPOE implementation.	d by 81%, serious errors reduced by 86%.	multi-year analysis. Limitation: Single hospital study.	Study)	
Hughes, R. G., & Blegen, M. A. (2008). *Medication Administration Safety*. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. https://www.ncbi.nlm.nih.gov/books/NBK2656/	Review medication administration safety strategies.	Literature review	Various settings (hospital, outpatient).	Review of IOM and FDA reports on medication errors.	7000 deaths annually due to medication errors, emphasizing need for CPOE, barcode scanning, and training,	Strengths: Comprehensive review Limitation: No new data.	Level V (Expert Opinion)	Moderate
Nagar, S., & Davey, Nicola. (2015). Reducing avoidable time delays in	Assess the impac	Quality impr	Geriatrics	Pre- and post-	Intervention worse	Strengths: Real	Level IV (Case	Moderate

immediate medication administration - learning from a failed intervention. ***BMJ Quality Improvement Reports*****,** ***4*****(1).** https://doi.org/10.1136/bmjquality.u206468.w2612	t of intervention on reducing medication administration delays.	ovement study.	ward, Leicester NHS Trust	intervention measurement of STAT medication delays.	ned delays from 1 hr. 15 min to 2 hr. 30 min due to communication issues.	world hospital data. Limitation: Small sample, negative intervention impact.	Study)	
Tsegaye, D., Alem, G., Tessema, Z., & Alebachew, W. (2020). Medication administration errors and associated factors among nurses. ***International Journal of General Medicine*****,** ***Volume 13*****, 1621–1632.** https://doi.org/10.2147/ijgm.s289452	Identify prevalence and causes of medication administration errors (MAEs) among nurses.	Cross-sectional study with observational components.	422 nurses in 5 referral hospitals in Ethiopia.	Self-administered questionnaire and direct observations.	57.7% MAE rate, with wrong time (38.6 %) and wrong assessment (27.5 %) as the most common errors	Strengths: Large sample size. Limitation: Self-reported data introduces bias.	Level IV (Descriptive Study)	Moderate

Tu, H.-N., Shan, T.-H., Wu, Y.-C., Shen, P.-H., Wu, T.-Y., Lin, W.-L., Yang-Kao, Y.-H., & Cheng, C.-L. (2023). Reducing medication errors by adopting automatic dispensing cabinets in critical care units. Journal of Medical Systems, 47(1), 52. https://doi.org/10.1007/s10916-023-01953-0	Assess the impact of automated dispensing cabinets (ADCs) on medication errors in ICUs.	Retrospective study comparing pre- and post-ADC periods.	ICU patients in a 1,200-bed hospital in Taiwan.	Data from the medication error reporting system.	Prescription errors were reduced from 3.03 to 1.75 per 100,000 dispensing errors from 3.87 to 0.	Strengths: Large dataset, objective tracking. Limitation: Focuses only on ICU settings.	Level III (Observational Study)	High

Synthesis of Current Literature

Prevalence and Impact of Medication Errors

The article "Medication Errors" by Tariq et al. (2024) provides an overview of medication errors, their causes, and strategies for prevention. It highlights that medication errors are a significant concern in healthcare, leading to adverse patient outcomes and increased healthcare costs. The authors emphasize that common causes include human errors, system inefficiencies, and communication breakdowns. The article underscores the importance of implementing technology-driven solutions, such as automated medication ordering systems, to minimize errors and enhance patient safety. The findings support the need for healthcare organizations to adopt automation as a strategy to improve medication management and reduce preventable harm.

Automation as a Strategy for Reducing Errors

The study "Reducing Medication Errors by Adopting Automatic Dispensing Cabinets in Critical Care Units" by Tu et al. (2023) evaluated the impact of implementing Automatic Dispensing Cabinets (ADCs) on medication error rates in intensive care units. The researchers conducted a retrospective analysis comparing medication errors before and after ADC adoption. Findings revealed a significant reduction in prescription errors from 3.03 to 1.75 per 100,000 prescriptions and dispensing errors from 3.87 to 0 per 100,000 dispensations. Additionally, administrative error rates decreased from 0.046% to 0.026%. The study concluded that ADCs effectively reduce medication errors in critical care settings.

Challenges and Unintended Consequences of Automation

The integrative review "Computerized Provider Order Entry–Related Medication Errors Among Hospitalized Patients" by Elshayib and Pawola (2020) examines the unintended consequences of Computerized Provider Order Entry (CPOE) systems in healthcare settings. The authors found that while CPOE systems aim to reduce medication errors, they can inadvertently introduce new types of errors due to factors such as system design flaws, user interface issues, and workflow disruptions. The review emphasizes the importance of addressing sociotechnical factors, including the interaction between healthcare professionals, technology, and organizational processes, to enhance the safe and effective implementation of CPOE systems.

The study "Automated Detection of Wrong-Drug Prescribing Errors" by Lambert et al. (2019) evaluated an algorithm designed to identify look-alike/sound-alike (LASA) medication prescribing errors within EHR systems. The research focused on assessing the specificity of this algorithm in detecting such errors. The findings suggest that implementing automated detection tools can enhance patient safety by reducing the incidence of LASA-related prescribing errors.

Best Practices for Safe Implementation of Automated Systems

The "ISMP Guidelines for the Safe Use of Automated Dispensing Cabinets" (2019) provide comprehensive recommendations to enhance medication safety through the effective use of ADCs. The guidelines emphasize the importance of optimal environmental conditions, robust system security, and proper configuration and functionality of ADCs. Key recommendations include ensuring adequate lighting and workspace around ADCs, implementing secure access controls, profiling ADCs to align with patient-specific medication orders, and regularly monitoring system overrides. Additionally, the guidelines advocate meticulous stocking and return processes, accurate display of patient and drug information, and ongoing staff education

and competency validation. By adhering to these practices, healthcare organizations can minimize medication errors and enhance patient safety.

Implications for Pediatric Residential Group Homes

The reviewed literature highlights the significant role of automated systems in reducing medication errors in healthcare settings, particularly in pediatric and critical care environments. Studies emphasize the effectiveness of ADCs and CPOE systems in mitigating errors related to medication ordering, dispensing, and administration (cite, xx?). However, challenges such as system design flaws and workflow integration issues underscore the need for careful implementation and continuous monitoring. The findings support the adoption of automated medication reordering processes in the pediatric residential home setting, as they have the potential to enhance medication availability, reduce human error, and improve overall patient safety.

Financial Challenges of Implementing CPOE Systems

The costs associated with implementing CPOE systems are considerable and can be particularly burdensome for small healthcare facilities. A study evaluating the return on investment (ROI) for vendor-developed CPOE systems in four community hospitals found that implementation costs ranged from $7.1 million to $19.3 million, with varying financial outcomes. One hospital group achieved a ROI of 11.3%, breaking even eight years post-implementation, while another experienced a negative ROI of -3.1%. The study attributed the modest financial returns to the lack of clinical decision support tools integrated with the CPOE systems (Zimlichman et al., 2013).

While specific recent data on the costs of implementing ADCs in small healthcare settings is limited, these systems also require significant investment. Expenses include the

purchase of the cabinets, integration with existing systems, staff training, and ongoing maintenance. For small organizations like Pope's place, these costs can be a major barrier to adoption. While the upfront costs are substantial, the potential for improved patient safety and operational efficiency may justify the investment over time. However, small healthcare organizations must carefully assess their financial capacity and explore all available resources to support the successful implementation of these automated systems.

PointClickCare's Advantages.

An alternative solution to automation is the use of PointClickCare's Integrated Medication Managment (IMM) system, which offers a more feasible and cost-effective option. PointClickCare is the EHR system used by Pope's Place..... (Points should be in narrative form or include it in a table and speak to this in your narrative referencing the table)

XVII. **Seamless Pharmacy Integration:** IMM connects facilities directly with their preferred pharmacies, enabling real-time electronic medication ordering and reducing reliance on manual processes such as phone calls or faxes.

XVIII. **Streamlined Medication Workflow:** The system automates medication order management, ensuring timely delivery and administration. This reduces medication delays and enhances staff efficiency by providing a consistent workflow for all prescribing needs.

XIX. **Enhanced Safety and Compliance:** IMM supports adherence to safety protocols by reducing errors and discrepancies in medication administration. Features like automated alerts and decision support tools help maintain compliance with regulatory standards (PCC IMM, n.d.).

PointClickCare's pricing structure includes a one-time implementation fee and ongoing monthly costs per contracted bed. These expenses are typically more manageable for small facilities compared to the substantial investments required for CPOE and ADC systems. By adopting PointClickCare's IMM, small pediatric residential homes can enhance medication management processes efficiently and affordably, improving patient safety without the financial burden associated with more complex systems.

Project Problem Identification

Internal Evidence

Organizational evidence, available as internal data collected through EHR and an event incident (EIR) reporting system, establishes the opportunity for evidence-based recommendations. The data was provided through the records department, by the Quality Director, from both the systems EHR and the EIR system. This data was then categorized by project members under the guidance of the project mentor. Medication errors attributed to unavailability are those medications that were not administered due to unavailability, for either lack of stock or insufficient quantities available for adequate dosing for administration.

Table 4

Internal Data of Medication Errors and Percentage Related to Unavailability

Month	Number of Medication Errors	Medication Errors due to Unavailability
December	14	29%
January	27	48%
February	19	42%
Total	60	41.7%

External Evidence?

(From Syallabus... "This section will describe the relationship of external data from the literature review and the internal organization data. This discussion should further highlight the rationale for the project.")

Project Recommendations

Medication errors related to medication unavailability and ordering inefficiencies significantly impact patient safety, workflow efficiency, and healthcare costs. To address these issues, this project focuses on leveraging EHR data, integrating pharmacy-EHR interfaces, and implementing standardized training and policies.

Recommendation One: Analyzing Medication Error Data

By the end of the three months of the EBP project implementation, the team will analyze EHR data and EIR system reports to identify at least three recurring patterns or root causes of medication errors at the facility to guide the development of targeted safety interventions aimed at reducing future errors.

Internal data reveals frequent medication stockouts and delayed refills, which contribute to missed doses and treatment interruptions. Medications such as Omeprazole, Ipratropium, Albuterol Nebulizer, and Diazepam, have been frequently reported as unavailable, delaying

patient care. Several EIRs document instances where prescriptions were missing prescription (RX) numbers, preventing automated refills, and requiring manual follow-ups by nurses and pharmacy staff. Additionally, inconsistencies in refill requests and a lack of structured medication tracking mechanisms result in delays that put patients at risk.

External evidence supports the effectiveness of EHR-driven medication error tracking. Hospitals use EHR data analysis to improve patient safety and reduce medication errors, according to studies of 69.4% (Hughes & Blegen, 2008). However, evidence also indicates that incident reporting alone captures only 10-25% of medication errors, making a combined approach with EHR analysis essential (Hughes & Blegen, 2008). By systematically analyzing both EHR and EIR reports, the facility can develop a more accurate understanding of medication errors, leading to evidence-based solutions.

Recommendation Two: Evaluating Third-Party Pharmacy EHR Integration Interfaces

In three months, the facility will check and write down the specific areas where the pharmacy system and the electronic health record (EHR) do not match, to find at least two main problems in workflow or communication that are causing medication shortages and delays, aiming to suggest ways to better connect the systems for easier access to medications.

Nurses frequently report medication stockouts, but pharmacy records do not always reflect real-time inventory levels or pending refill requests, leading to missed doses and increased manual follow-up efforts. Multiple instances of delayed prescription refills due to missing RX numbers. Incomplete records, or lack of system visibility, are evident in internal reports. As a result, nurses must frequently call the pharmacy for medication status updates, which slows down workflow efficiency and increases the risk of human error. The current state

of the charting system, PointClickCare, does not have a pharmacy interface added, which could mitigate this challenge.

External studies highlight the benefits of integrating pharmacy systems with EHRs to enhance medication safety. Evidence indicates that medication reconciliation via EHR integration can reduce errors by up to 40%, particularly during transitions of care (Barnsteiner, 2008). Additionally, hospitals using third-party pharmacy-EHR interfaces have reported improved stock medication tracking and fewer administration delays (Abraham, 2020). By implementing a system that allows real-time tracking of medication availability and pending refills, the facility can significantly reduce stockouts, minimize delays, and enhance patient safety.

Recommendation Three: Implementing Training, Education, and New Medication Safety Policies

Within three months, the facility will develop and implement a standardized training program for medication safety and a medication reconciliation policy for all direct care staff. The program will aim to reduce medication errors, specifically dosage discrepancies and missed doses, by at least 15%, as measured through EIR data, by addressing identified knowledge gaps and promoting consistent medication management practices across departments.

Internal data from the facility shows that medications errors are frequently linked to knowledge gaps and inconsistent medication reconciliation processes. Several EIRs document incorrect administration of medications, dosage discrepancies, and confusion over prescription details, such as in the case of Diazepam, where an incorrect strength was given. Additionally, staff have missed doses due to medication reconciliation issues, as they are unaware of the proper ordering or administration of certain medications. The lack of clear policies and

standardized training programs has resulted in inconsistent medication management across departments.

External evidence strongly supports structured training and policy implementation as a strategy for reducing medication errors. Evidence shows that medication errors are 78% more likely to occur in staff with inadequate training (Hughes & Blegen, 2008). In one study, a web-based educational intervention reduced non-IV medication errors from 6.1% to 4.1%, demonstrating the impact of structured education on medication safety (Hughes & Blegen, 2008). Additionally, implementing standardized medication reconciliation policies has been shown to prevent up to 20% of adverse drug events (Barnsteiner, 2008).

By developing a comprehensive training program and standardized safety policies, the facility can ensure that staff have the necessary knowledge and tools to prevent medication errors, improving patient safety.

Future Recommendation One: Implementing Automated Dispensing Cabinets (ADCs) for Medication Reordering

To further improve medication availability and reordering efficiency, the facility may consider implementing ADCs. Internal data reveals frequent medication stockouts, leading to missed doses and incomplete treatments. Nurses and pharmacy staff spend critical time tracking down missing medications, which could be avoided with a more automated inventory management system.

External studies highlight the effectiveness of ADCs in reducing prescription, dispensing, and administrative errors. Research shows that after ADC implementation, prescription errors dropped from 3.03 to 1.75 per 100,000 prescriptions, while dispensing errors fell from 3.87 to 0

per 100,000 (Tu et al., 2023). ADCs also improve workflow efficiency and medication tracking, ensuring that stockouts are minimized and reorders happen proactively (Tu et al., 2023).

Future Recommendation Two: Integrating Computerized Physician Order Entry (CPOE) with Decision Support

Another future consideration for the facility is implementing a CPOE system with decision-support features. Internal data indicates frequent medication ordering errors, including incorrect dosages, missed orders, and expired medications being dispensed. Additionally, manual prescription tracking increases the risk of errors, as seen in cases where medications were given at the wrong strength or not reordered on time.

External research supports the role of CPOE in significantly reducing medication errors. One study found that CPOE decreased medication errors by 81%, reducing wrong dose, drug, and route errors (Bates et al., 1999). Additionally, real-time alert systems within CPOE can help prevent ordering mistakes, addressing concerns raised in 22% of observed medication ordering errors that reached patients before correction (Abraham et al., 2020). Integrating CPOE with ADCs ensures that medications are reordered before stock runs out, further improving medication availability and patient safety (Hughes & Blegen, 2008).

Project Implementation Plan

Medication errors related to medication unavailability and ordering inefficiencies impact patient safety, operational workflows, and healthcare costs. This plan focuses on EHR-driven analytics, system integration, and standardized education policies to reduce medication errors.

Change Theory Lewin's Three-Stage Model

Lewin's Three-Stage Change Model provides a practical and widely accepted framework for leading and sustaining organizational change in healthcare settings, making it well-suited for

this EBP project (Roussel, Thomas, & Harris, 2023). The first phase, Unfreeze, focuses on recognizing the need for change and preparing staff to let go of outdated practices. At the facility, internal EHR and EIR data reveal recurring medication safety issues such as stockouts, refill delays, inconsistent reconciliation, and knowledge gaps, creating a clear and compelling case for improvement. Leadership must engage stakeholders, build urgency, and foster readiness for change by highlighting the risks to patient safety and aligning the team around a shared vision (Roussel et al., 2023).

In the Change phase, the project introduces specific interventions to improve medication safety and workflow efficiency. These include integrating pharmacy systems with the EHR, launching EHR-based medication tracking, establishing standardized medication reconciliation policies, and implementing structured staff training. This stage emphasizes educating staff, modifying routines, and providing ongoing communication and support to reinforce new behaviors (Roussel et al., 2023).

The final stage, Refreeze, seeks to institutionalize these improvements, so they become embedded in routine practice. The facility will update policies to reflect new procedures, incorporate training into onboarding and continuing education, and use EHR analytics to monitor outcomes and ensure adherence. Continued leadership support will be essential to reinforce the change, prevent regression, and sustain long-term improvements in medication safety (Roussel et al., 2023). Overall, Lewin's model effectively addresses both behavioral and structural elements of change, aligning closely with the objectives of this EBP initiative.

Key Stakeholders

The successful implementation of this project depends on collaboration across multiple departments. Nurses and pharmacists are key frontline stakeholders interacting directly with

medication ordering, administration, and inventory management. Their input will be crucial in identifying operational pain points and testing new workflows.

The Information Technology (IT) and data analytics teams will ensure that EHR systems can track medication errors and communicate with the pharmacy interface. Administrators will provide leadership support, funding, and policy approvals, ensuring that the project aligns with the facility's long-term strategy.

Barriers and Facilitators/Drivers and Resistors to Change

One of the main barriers to change is resistance from staff who may be unfamiliar with new EHR tracking methods and system integrations (Abraham et al., 2020). They may feel that these changes add to their workload, which could slow adoption. Additionally, delays in system upgrades and budget constraints may present obstacles.

However, strong leadership support, structured training, and clear communication will facilitate change (Nagar & Daley, 2015). Evidence shows that when staff understand the direct impact of improvements on patient safety, they are more likely to embrace new protocols (Hughes & Blegen, 2008).

Business Impact

This project will have significant financial and operational benefits. Medication errors cost the healthcare system over $3.5 billion annually (Tsegaye et al., 2020) and improving medication tracking can reduce waste and prevent costly adverse events. Additionally, streamlining workflows through EHR-driven tracking and pharmacy integration will improve efficiency, reduce manual errors, and optimize staff time.

Organization Planning Process

Aligning with the facility's 100-Day Plan, this project will be implemented in three structured phases over a 12-week period. The plan will include training sessions, system upgrades, and ongoing performance evaluations to ensure successful integration into the organization's existing workflow. (Organizational goals that this work aligns with? Expand on this)

Implementation Action Plan

During the first four weeks, the team will focus on analyzing internal data, training staff, and updating policies. Weeks five through eight will involve testing pharmacy-EHR integration, refining workflows, and evaluating initial error reduction trends. The final four weeks will be dedicated to assessing outcomes, adjusting, and reinforcing training.

The implementation of this project will involve key stakeholders, including the hospital IT team, which will oversee system integration, and the nursing and pharmacy leadership, who will be responsible for training staff and ensuring policy oversight. The primary actions will include configuring EHR analytics to track medication error rates and integrating the EIR system into existing safety protocols, following the framework outlined by Hughes and Blegen (2008). This initiative will take place at Pope's Place, a pediatric group home with a capacity of 20 beds. The necessity of this plan stems from the critical need to reduce medication errors, which can lead to preventable patient harm. By leveraging data-driven decision-making, the project aims to enhance patient safety and minimize risk (Barnsteiner, 2008). (100 day plan shold be ref)

Project Measurement Plan

The success of this project will be measured through key performance indicators (KPIs) that track medication safety improvements. Data collection will focus on error rates, medication stockout frequencies, and staff compliance with new policies.

EHR logs will serve as the primary data source, allowing for automated tracking of medication availability and error reports. Additionally, direct observation and staff feedback will be used to assess workflow efficiency and training effectiveness.

The data will be analyzed by examining medication error rates using the newly introduced measures. Progress will also be tracked weekly to ensure that adjustments can be made in real time.

The overall goal is to reduce medication-related errors by at least 15% within the 12-week implementation period, with long-term monitoring to ensure continued success.

By integrating EHR data tracking, pharmacy-EHR system improvements, and structured training programs, the facility can reduce medication errors, improve operational efficiency, and enhance patient safety. Future technologies such as ADCs and CPOE could further optimize medication availability and ordering accuracy. This evidence-based, data-driven approach will enable the organization to achieve sustainable improvements in medication safety and patient care.

Human Subject Protection Plan

In accordance with the IRB through the established guidelines pursuant to Health and Human Services Common Rule 46CFR 102(e), this evidence-based project is not required to provide a human subject protection statement. This is a process improvement project to provide evidence-based best practice supported by evidentiary information collected from verifiable electronic sources and will not directly use human subjects.

Conclusion

As evidenced by internal data shared from Pope's Place, there is an opportunity for process improvement within the medication administration system. Implementation of

recommended improvements in evidence-based processes should decrease medication errors, specifically the process of medication ordering and delivery in a consistent system, eliminating the lack of availability. Evidence has shown the utilization of a dedicated process aligned with an electronic based communication system in the delivery and administration of medications will reduce the number of medications errors, creating a barrier of safety for patients and resulting in an improvement of the environment of care. The outcome goal is to increase patient safety while at the same time providing the organization with a decrease in operating expenses through an increase in staff efficiency and a reduction in waste.

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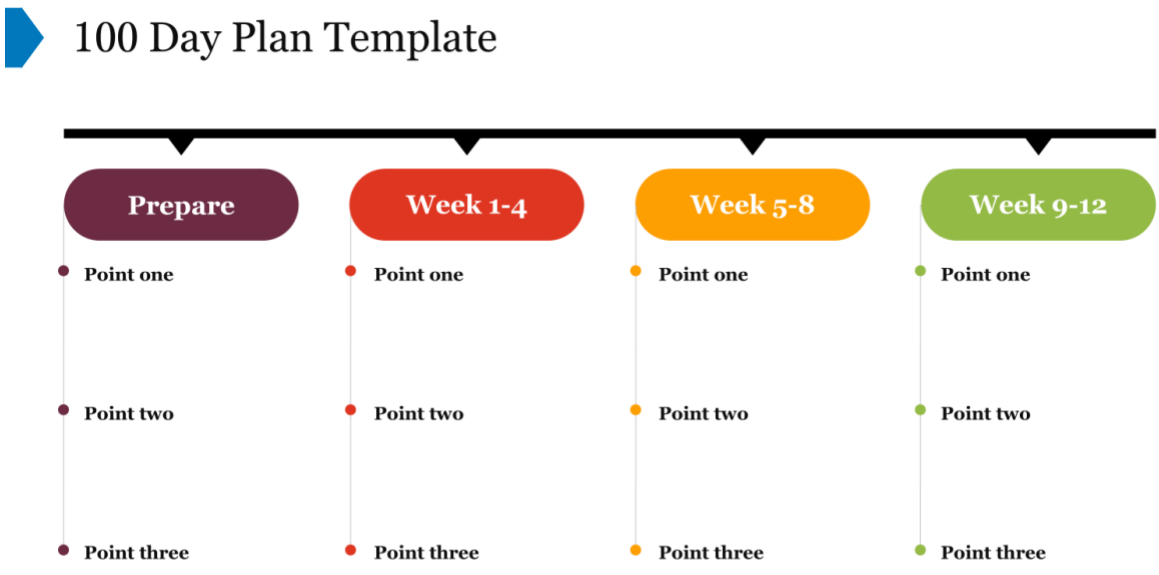
Appendix A

One hundred Day Plan Template



Appendix B

Organizational Letter of Support

Appendix C
Statement of Determination

Appendix D
Determination Letter from IRB