



Giving the PIS Its Due: A Communications Hub for Medication Management Systems

IF THERE WERE A POPULARITY CONTEST FOR HEALTH CARE IT COMPONENTS, the pharmacy information system (PIS) likely would finish in last place. Most of the time, the PIS runs dependably in the background, unremarkable, unsung, and untapped. Yet, when fully harnessed, the power of the integrated PIS elevates the performance of multiple software and automation solutions. It is time for the PIS to get its due.

At AnMed Health, we stretched our PIS—Horizon Meds Manager (HMM) from McKesson—to act as a single, dynamic platform that enables us to follow a systems approach across all of our medication management IT. We now approach all clinical systems workflow with a more holistic view, allowing us to drive best practices, ensure optimal process change, enhance communications, and enable the best care possible. On a more practical level, this systems approach means:

- One system to use and maintain
- One interface to install
- One support desk to call
- Solutions that grow together

The outcomes are demonstrable improvements in quality and lowered cost of care—results that capture the attention and support of our board of trustees—even if the PIS remains largely unnoticed in the background.

System Integration

AnMed Health is a not-for-profit, community-based provider located in Anderson, South Carolina. Our flagship facility is AnMed Medical Center, a 461-bed, acute-care community hospital. The pharmacy is open 24 hours, seven days a week. We have a hybrid medication dispensing philosophy. More than 90% of our medications are provided to nurses from the central pharmacy in bar coded, patient-specific form via automation technology. Nurses retrieve narcotics, PRNs, and some first doses from medication cabinets. This frees our pharmacists from intense, manual dispensing tasks, and enables us to be involved with patient prescribing patterns on the front end of the medication-use process.

Where to Start?

The greatest challenge to implementing PIS as a communications hub, is determining where to start. While every hospital situation is unique, my recommendation is to focus on the patient and work your way back. Starting at the bedside will ensure that you keep patient safety continuously at the forefront of every one of your initiatives.

For instance, our PIS integrates with our medication dispensing cabinets and our point-of-care medication scanning systems, resulting in productivity improvements. Here are several examples of current and future functionality:

Goal #1: Enhance Medication Safety

- **Reduces potential for adverse drug events:** The drug formulary interface between our PIS, dispensing cabinets, and bar coded medication administration platform establishes consistent drug formulary support throughout the hospital. This minimizes data configuration requirements and reduces caregiver phone calls, and significantly reduces the potential for adverse drug events (ADEs) that can be caused by disparate information.
- **Reduces override communication breakdowns:** Cabinet override notices are sent directly into the PIS work queue for prompt pharmacist review.
- **Enables dose-level holds in accordance with compliance recommendations:** Our cabinets support “hold dose” orders from the PIS work queue. This feature supports ISMP/Joint Commission recommendations to hold drug doses, rather than drug therapies. After the hold expires, the order is automatically reactivated.
- **Provides pharmacists with insight into actual administration times:** With caregivers using a bar coded medication administration platform, pharmacy can use our PIS to view administration times and results. This helps the pharmacist to monitor and report on missed doses, and also aids the pharmacist in making clinical decisions based on actual administration.



By integrating their PIS and automated dispensing robot, AnMed has been able to improve order prioritization and inventory control.



Case Study

Real Life Scenarios That Impact Medication Safety

Scenario 1: Medication Overrides

Nurse 1 is with a distressed patient. The attending physician gives a verbal order to address the patient's pain. Nurse 1 goes to the medication cabinet, performs an override, dispenses the medication, and administers it to the patient.

Then, Nurse 1 goes on a lunch break. Minutes later, while making rounds, the resident physician gives Nurse 2 a verbal order for the same medication. Nurse 2 also goes to the medication cabinet, performs an override, dispenses the medication, and administers it to the patient, creating a potential adverse drug event.

With PIS integration: The pharmacist would have immediately seen the multiple overrides in the PIS and been able to take corrective action to prevent the potential overdose.

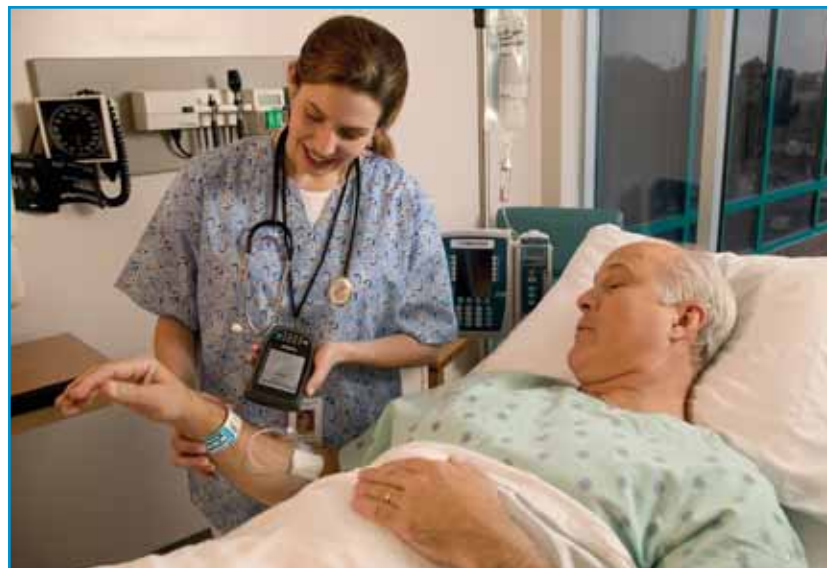
With Bar Coded Medication Administration: Nurse 2 would have known that the patient had received the same medication dose just minutes before, because it would appear in the patient's profile in the administration platform. The system will also trigger an alert to the caregiver.

Scenario 2: Hold Doses and Drug Formulary Integration

The diabetic patient, who has been treated with a newly developed oral hypoglycemic medication, is scheduled for surgery. The attending physician has ordered a hold on the patient's hypoglycemic doses until post-op observation, when therapy is scheduled to resume. When the order is entered, the medication is deleted from the patient's profile. The nurse writes a note in the patient's chart as a reminder to restart the drug therapy—a workflow procedure that could result in an adverse drug event through medication omission.

Furthermore, because all disciplines may not be aware of the adverse renal issues with this medication, pharmacy and nursing each may reference different drug formularies that have multiple data configuration issues—creating drug-identity-resolution problems that could lead to an adverse drug event.

With PIS-Automated Dispensing Cabinet integration: The pharmacy can place the hypoglycemic doses on hold without having to put the entire therapy on hold. The scheduled doses automatically remain "grayed out" in the cabinet's patient profile until the hold order expires, but are fully visible for all caregivers to view. Also, because the PIS and the cabinets share a common, context-relevant, integrated drug formulary, both pharmacy and nursing are referencing the same database, eliminating a significant safety failure point.



Because AnMed's BCMA system is integrated with its PIS, nurses can send order-specific electronic messages related to medication administration to pharmacy.

Goal #2: Optimize Medication Cabinet Inventory

- **Saves pharmacy FTE time:** Our PIS gives pharmacy a real-time view into medication inventory inside our automated dispensing cabinets. Pharmacists can monitor quantity-on-hand updates at the end of each order, and know when inventory replenishment is complete. Our PIS can also send a dispensing request to the appropriate filling device and inventory location, maximizing refill efficiencies. The real-time interface between our PIS and our cabinets ensures that our pharmacy will have the most current, up-to-date inventory information.

Goal #3: Give Nurses More Time for Patient Care

- **Eliminates redundant login steps:** System integration simplifies our process for adding caregivers to the system. Temporary nurse users can be entered into the system for both Horizon Admin-Rx and AcuDose-Rx with one security set.
- **Ensures needed meds are always available:** Our cabinets automatically notify the pharmacy of caregiver actions—such as dispensing and administration overrides, missing medications, and refill requests—via the PIS work queue. This expedites order verification for overrides, ensures medications are available when needed, and reduces caregiver phone calls to pharmacy.

Goal #4: Maximize IT Investment

- **Reduces the number of potential failure points:** Establishing a single platform for clinical and automation system integration minimizes potential failure points and maintenance time and costs.
- **Ease FTE burdens on IT:** All of our McKesson automation systems employ user-file synchronization, ensuring consistency and simplifying table builds and ongoing maintenance across applications.

Increasing Our Clinical Pharmacist Activities

These advancements have enabled us to escape the boundaries of the pharmacy and perform more clinical work throughout the hospital. Our inpatient monitoring activities include risk reduction, conducting physician consults, and promoting cost-effective medication substitutions aligned on evidence-based guidelines. At AnMed Medical Center, we average about 10,000 phar-



Case Study

Our PIS gives pharmacy a **real-time view** into medication inventory inside our automated dispensing cabinets.

macist-patient interventions per year. In 2006, our total combined IV-to-PO and renal interventions saved our hospital system more than \$220,000.

We know that there is even more we can do with our PIS hub approach. Some of the projects we are currently working on include enhancing the pharmacy work queue, providing tighter integration with “link” orders, establishing dose-level tracking, and evaluating all of our current manual processes.

Since we have begun to think more holistically in terms of clinical systems workflow, we have made great strides in terms of safety, quality, and cost reduction. In spite of its low profile, we know that our pharmacy information system is a significant contributor to these improvements. ■

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Disclosure: The author is a member of the McKesson Health Systems speakers bureau.

▶ Cabinet override notices are sent directly to AnMed's PIS work queue for pharmacist review.



The Systems Scoop

At AnMed Medical Center, the following automation and software systems are integrated with the HMM pharmacy information system:

- **Horizon Expert Orders computerized physician order entry:** HMM integration adds key functionality, including bi-directional ordering, formulary updates and additions, and electronic order verification and data access.
- **Horizon MedComm-Rx fax/imaging medication order system:** Each day, we average 75 STAT orders (15-minute turnaround) and 390 routine orders (maximum two-hour turnaround, with an average of 20 minutes).
- **PakPlus-Rx bar code packaging:** Systems integration ensures that our on-site packagers are preparing unit-dose medications to meet changing priorities, while supporting bedside administration.
- **ROBOT-Rx system to automate medication dispensing:** More than 90% of all medications leaving the central pharmacy are dispensed by the robot. By integrating robot dispensing with the PIS, we can improve order prioritization and tighten inventory control.
- **AcuDose-Rx automated medication cabinets for unit-based dispensing:** Our 52 main cabinets are used for profile dispensing narcotics, PRN medications, and select floor stock, substantially reducing nursing-selection errors.
- **Horizon Admin-Rx for bar code administration:** At AnMed, 96% of all medications are scanned prior to administration — on average, approximately 4,500 meds per day. Because HMM is integrated with our scanning technology, we have actually improved nursing workflow — a frequently cited barrier to implementation. For example, nurses can now send pharmacy order-specific electronic messages relating to medication administration. These electronic messages appear almost immediately in a pharmacy work queue for processing.
- **Cerner Millennium Lab systems:** With PIS integration, we have been able to customize lab information for pharmacy's use. For example, critical upper and lower limits can be individually established to coincide with pharmacy needs. In addition, we can configure results in easy-to-view groupings.

Very few vendors can provide organizations with everything they need. But we have found that, when possible, working with a single vendor can enhance the functionality of each individual product. We also expect and demand a certain level of integration between a vendor's products. With the ever-increasing complexities of medication administration, pharmacy systems are now playing a vital role in all aspects of the medication-use process.

WHERE TO FIND IT:

McKesson Health Systems Circle reader service number 45 or visit www.mckesson.com

Cerner Corporation Circle reader service number 46 or visit www.cerner.com