



## STREAMLINING YOUR HOSPITAL PHARMACY OPERATIONS

---

**How a Real-Time Advanced Medication Tracking System  
Increases Productivity and Improves Patient Care**

## INTRODUCTION

# The Problems Facing Your Hospital Pharmacy

In hospitals of every size, from general to specialty care, the pharmacy is a crucial center of operations. Precision and efficiency in the hospital pharmacy has a direct relationship with both the quality of patient care and the productivity of the hospital staff.

For many hospitals, medication tracking systems are far from perfect. Despite the best efforts of the staff involved, issues arise that can compromise patient care, slow day-to-day operations, and potentially cause serious problems for patients and staff.

Among the challenges your hospital pharmacy is likely to face are:

- First dose medication tracking
- Excessive re-dispensed doses
- Inefficient research for medication events
- Search and communication issues for missing doses

The medical industry as a whole has been slow to adopt new technologies—largely due to the complexity of the systems that must be transferred to digital channels. However, most facilities have now embraced electronic systems.

Advanced medication tracking systems such as MedEx can drastically improve these common challenges for hospital pharmacies, resulting in increased efficiency, higher productivity—and most importantly, improved patient care.

## BUSY HOSPITAL, CRITICAL CARE

### About Mercy Hospital, St. Louis



The only Level I trauma center—and the only dedicated pediatric hospital—in St. Louis County, Mercy Hospital is ranked no. 2 in Missouri on U.S. News & World Report's "Best Hospitals List for 2013 – 2014," and ranks ninth overall in the United States for integrated health care delivery by Modern Healthcare.

Mercy Hospital maintains a pediatric emergency department and the largest Level III neonatal intensive care unit in the state. The hospital also provides services for oncology and pediatric oncology, obstetrics, gynecology, cardiovascular, burns, stroke, neurosurgery, behavioral health, home health, hospice, and many more.

With 979 licensed beds and 25 outpatient centers, Mercy Hospital is critical in providing emergency and ongoing healthcare services for Missouri's citizens and families.

## THE CASE STUDY

### Mercy Hospital and MedEx™

At Mercy Hospital in St. Louis, Missouri, missing and re-dispensed doses had a significant impact on pharmacy operations. The delays and confusion caused by missing doses served to divert primary staff—including pharmacists, nurses, and technicians—away from their primary goal of caring for patients.

The pharmacy director at Mercy Hospital made the decision, along with the staff, to implement a real-time medication tracking system in an effort to improve patient care and productivity. They chose to work with the Aethon MedEx™ solution to proactively address these common hospital pharmacy issues.

An independent study implemented by economic consulting firm Shack & Tulloch, Inc., quantified and documented the impact of the MedEx system on pharmacy operations at Mercy Hospital throughout the first year of use. The study quantified the benefits of the system demonstrating its value to the hospital, clinical staff and its patients. The aforementioned study is the basis of this white paper.



## THE CASE STUDY

# Mercy Hospital: Challenges and Solutions

Challenges	Aethon MedEx Solution
Improve first-dose medication tracking	Web-based system with real-time medication delivery status
Reduce re-dispensed doses	Instantly updated communication keeps all staff informed of dispensed doses
Efficiently research medical events	Real-time event logs enable timely, efficient research
Improve communication of missing doses	Barcode / RFID / Biometrics ID enables tracking of all doses
Boost productivity for key staff	System tracks operational performance
Improve patient care and safety	Reduction of missing doses ensures timely and accurate medication, and increased attention from staff

## CHALLENGE

# First-Dose Tracking and Re-Dispensed Doses

**The issue:** Re-dispensed doses not only impact patient care, but also cause productivity to suffer. When doses are missed, key hospital staff must engage in non-productive activities to correct the problem, taking time away from their patients.

**Pharmacists** are the most impacted by this issue. A missing dose interrupts their current activity, and typically they'll answer calls, look for the missing dose, check to see if it's been previously dispensed, and refill the dose before resuming their work.

**Technicians** will look for the dose, re-pick the correct medication, and sometimes deliver the re-dispensed dose to the floor.

**Nurses** usually have to stop what they're doing, put in a call to the pharmacy, and search for the missing dose.

**At Mercy Hospital, prior to the implementation of MedEx missing doses averaged 189 per day, or 5,762 per month.**

**The solution:** Aethon MedEx was implemented at Mercy Hospital in the summer of 2012. By the end of the year, the number of missing doses averaged 5,520 per month and, after the implementation of MedEx, missing doses averaged 4,298 per month, for a 25% improvement.

Mercy Hospital expects further reductions as the system is rolled out more extensively and projects a 75% reduction in missing doses.

## CHALLENGE

### Productivity

**The issue:** Each re-dispensed dose wastes time for key hospital staff that would be better spent on clinical tasks. On average, pharmacists lose 8.5 minutes per missing dose, technicians lose 4.1 minutes, and nurses lose 4.3 minutes.

This adds up to thousands of hours per year lost—and also creates wasteful spending for hospital administration in loss of productivity.

**The solution:** With a reduction in time lost per missing dose due to implementation of the MedEx solution, Mercy Hospital was able to more effectively utilize staff time. One year of implementing MedEx advanced medication tracking systems saved:

**Pharmacists:** 6,000 hours per year, adding \$410,000 in productivity per year

**Technicians:** 6,000 hours per year, adding \$142,000 in productivity per year

**Nurses:** 1,250 hours per year, adding \$45,000 in productivity per year

**Overall, Mercy Hospital realized a \$600,000 gain in annual productivity.**

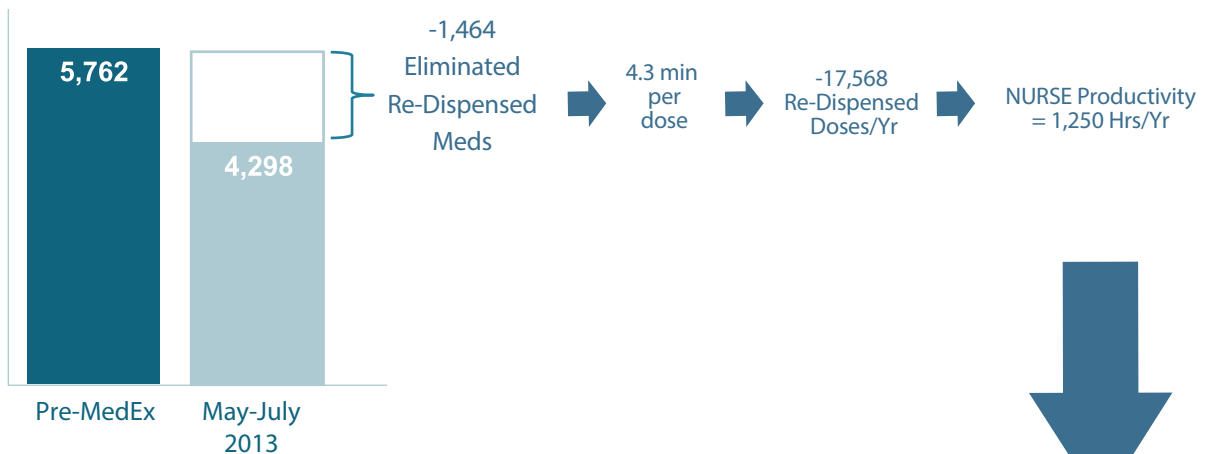
**Also, pharmacists' clinical intervention increased by 60% after one year—from 10% pre-MedEx to 16% of their total activity.**

## MERCY HOSPITAL Nurse Productivity



Nurses are on the front line of receiving medication orders for their patients. When a missing dose event occurs, it diverts their time away from the patient to find the medication or call the pharmacy to resolve it.

### Eliminate Missing First Doses & Improve Missing Dose Resolution Efficiency



#### NURSE Productivity Realized as:

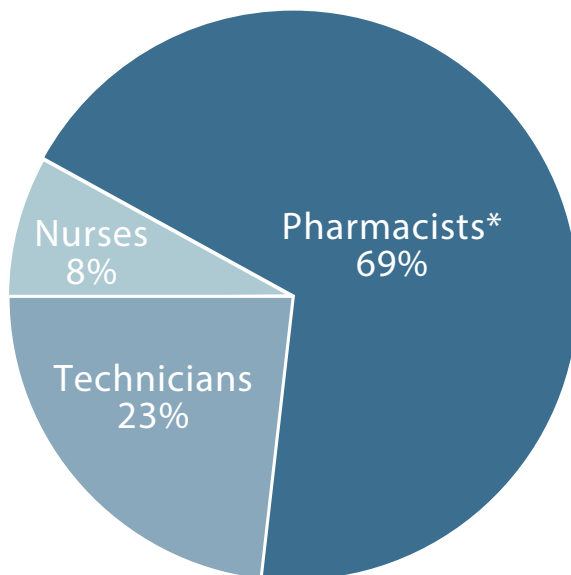
- Ability to Spend More Time with Patients
- Less Use of Agency Nurses
- Less Overtime

**\$45,000**  
Productivity / Year



## MERCY HOSPITAL Total Productivity Summary

Annual productivity of  
reduction of missing first doses and  
improving missing dose resolution efficiency



\*Pharmacist clinical  
intervention increased  
from 10% to 16% of  
their time.



**\$600K Annual Savings**

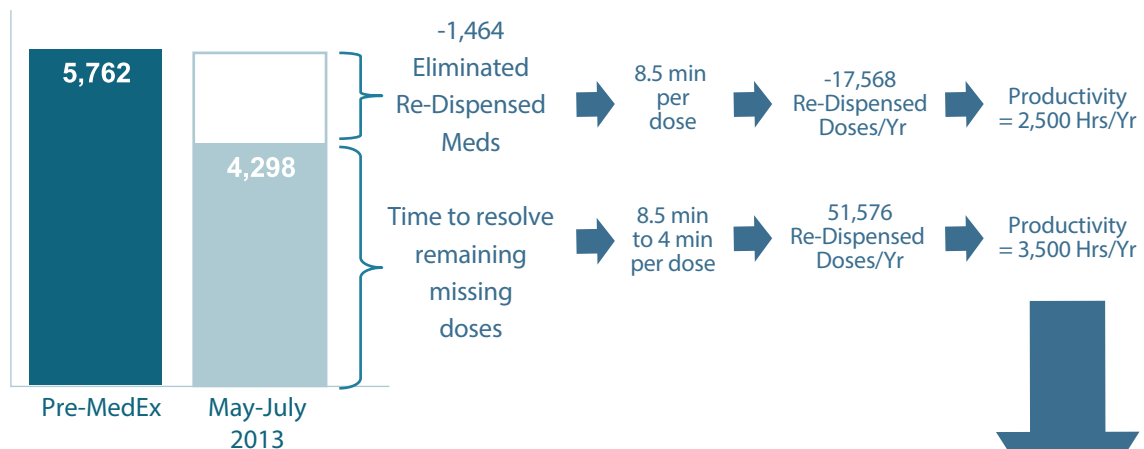
**60% Improvement**

## MERCY HOSPITAL Pharmacist Productivity



The productivity of pharmacists improved after implementing MedEx due to the time saved that would have been spent resolving missing dose events (8.5 min per event). It also improved due to the fact that any remaining missing dose events were resolved in 50% of the time (from 8.5 min to 4 min per dose).

### Eliminate Missing First Doses & Improve Missing Dose Resolution Efficiency



#### PHARMACIST Productivity Realized as:

- Increased pharmacist intervention (3.5 pharmacists)
- Improved patient safety (fewer interruptions)
- More cost-effective medication use & fewer ADEs

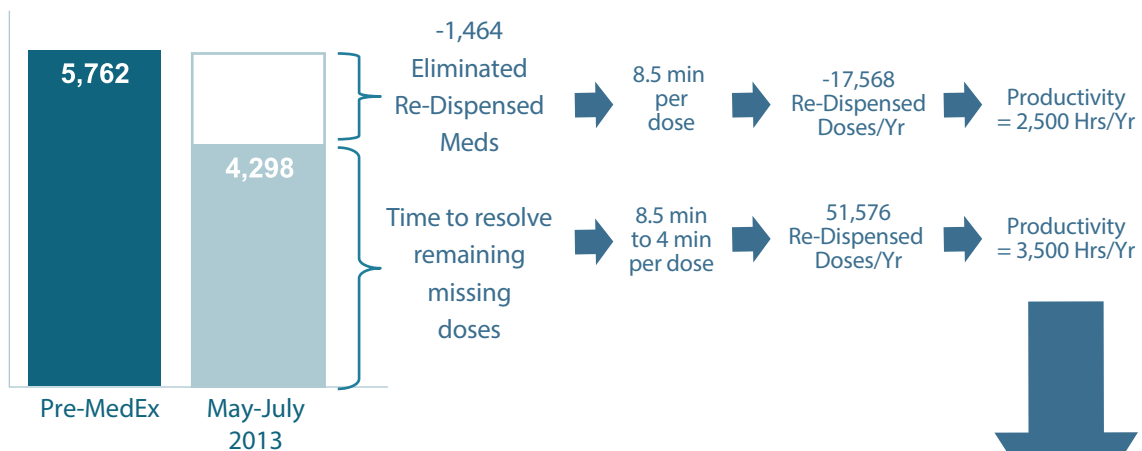
**\$410,000**  
Productivity / Year

## MERCY HOSPITAL Technician Productivity



The productivity of technicians improved after implementing MedEx due to the elimination of missing doses. It was observed that technicians spent time in addition to the time pharmacists spent on the same missing dose events. Multiple people within the department were spending spent time resolving each missing dose event.

### Eliminate Missing First Doses & Improve Missing Dose Resolution Efficiency



#### TECHNICIAN Productivity Realized as:

- Redeployed to value-added tasks (e.g., medication, reconciliation)
- Ability to handle increased patient volume without adding technicians

**\$142,000**  
Productivity / Year

## OPERATIONAL IMPACT

### How Staff Productivity Improved

#### Pharmacists

- Increased pharmacist clinical intervention: 3.5 pharmacists at Mercy Hospital were able to move from routine tasks in the pharmacy to clinical intervention on the floors
- Improved patient care and safety due to reduced interruptions, increased pharmacist availability and increased responsiveness
- More cost-effective use of medication
- Reduction in adverse drug events



#### Technicians

- Moved from routine to value-added tasks, such as medication reconciliation
- Increased patient volume: The technicians at Mercy Hospital were able to comfortably handle more patients, eliminating the need to add more technicians to the staff

#### Nurses

- Able to spend more time with patients, tending to their needs
- Reduced the need for agency nurses
- Less overtime needed to cover patient load

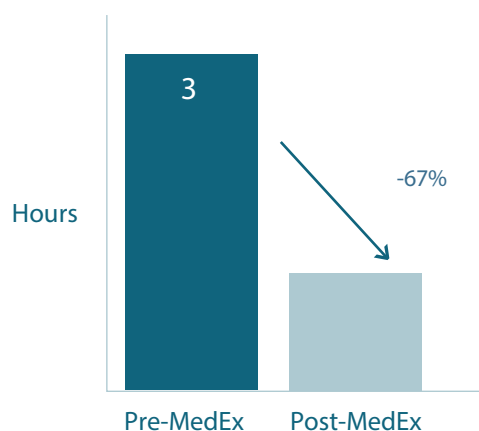
## CHALLENGE

# Investigating Medical Events

Prior to the implementation of MedEx, key pharmacy staff at Mercy Hospital spent an average of three hours investigating each medication event—gathering information on the sequence of activities leading to the medical event and the personnel involved that were required for an accurate analysis.

With the MedEx solution, staff members now spend an average of one hour tracking down the right information—and ultimately arrive at a more accurate analysis of medical events. This is a 67% reduction in average time, allowing for significantly increased productivity as well as more reliable accuracy.

### Time Spent Investigation Medication Event



## CHALLENGE

### Inventory Expense of Missing Doses

An additional problem with missing doses is the cost of labor for re-stocking found doses, and the cost of write-offs for the doses that remain missing.

During the first year of MedEx implementation, the number of doses that were missed and found, which required re-stocking, was 2,636 less than the pre-MedEx year. In addition, write-offs decreased to 17% due to more medications being found.

#### -17,568 Annual Missing Doses\*

85% Missing Doses Found & Re-stocked	15% Write-offs
-14,932 Found & Re-stocked Medications	-2,636 Medication Write-offs

## CONCLUSIONS

### Key Insights and Future Performance

During the first year Mercy Hospital of St. Louis implemented the Aethon MedEx solution to in-hospital operations, they realized substantial gains in productivity. The hospital is currently extending MedEx tracking to their 24-hour Patient Specific fill procedure. With the current procedure, all visibility is lost once the fill leaves the pharmacy. MedEx tracking solutions will extend visibility to all of the hospital's medication doses, including those involved in 24-hour Patient Specific fills.

Other future implementations include MedEx scanners, which will improve the safety process through final pharmacist verification of a product before it leaves the pharmacy. Each product will be loaded into the scanner, and the pharmacist will be able to quickly and accurately identify that the correct products are included, prior to sending the patient's bag to the floor.

**With optimized MedEx processes in place, Mercy Hospital expects to reduce missing doses by 75% over the next year of operation.**



**Steve Frigo**  
RPh Director Pharmacy Services  
Mercy Hospital St. Louis

*"MedEx delivered the capability that we expected. Our missing/redispensed doses have significantly dropped in the first year. This has resulted in productivity gains in the pharmacy, both for pharmacists and technicians. It has allowed us a quicker response to nurses regarding missing doses.*

*The gains thus far have been impressive, and we believe we can significantly increase these gains going forward."*

## Summary of MedEx Solution Impact in the first year at Mercy Hospital St. Louis

- Missing doses reduced by 25%
- Trained medical personnel eliminated time spent on non-productive activity time
- Saved: \$600,000 in the first year
- Productivity gained: 13,250 hours in the first year
- Investigation of medical events is 67% faster, with more accurate and complete results
- Expenses reduced: medication stocking costs, medication waste
- MedEx solution helped staff identify opportunities for process improvement

