

LEAN SIX SIGMA PROJECT READOUT

Safe Medication Dispensing

Pyxis Discrepancy Reduction — Define, Measure, Analyze, Improve, Control

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Goal: zero medication-dispensing discrepancies during the patient stay

Project at a Glance

Problem	Recurring medication-safety concerns from discrepancies in the Pyxis automated dispensing process.
Goal	Zero medication-dispensing discrepancies during the patient stay.
Secondary aims	Improve medication safety, reduce rework, and raise employee satisfaction.
Team	Executive sponsorship, Pharmacy leadership, pharmacists, technicians, nursing from inpatient and procedural areas, education, and operations.
Scope	Dispensing from and returning medications to Pyxis, plus pharmacy replenishment and cart fill.

Why This Project

Highly reliable care

Protect every patient from a wrong-medication event during their stay.

Better dispensing

Standardize how medications move from carousel to Pyxis pocket.

Better returns

Close the gap in how nurses return medications to Pyxis and pharmacy.

Accountability

Give leaders a defined workflow they can hold their teams to.

The Scale of the Operation

1,528,480

Doses dispensed from Pyxis

12-month volume

707

**Medications returned by
nurses**

In a single 30-day period

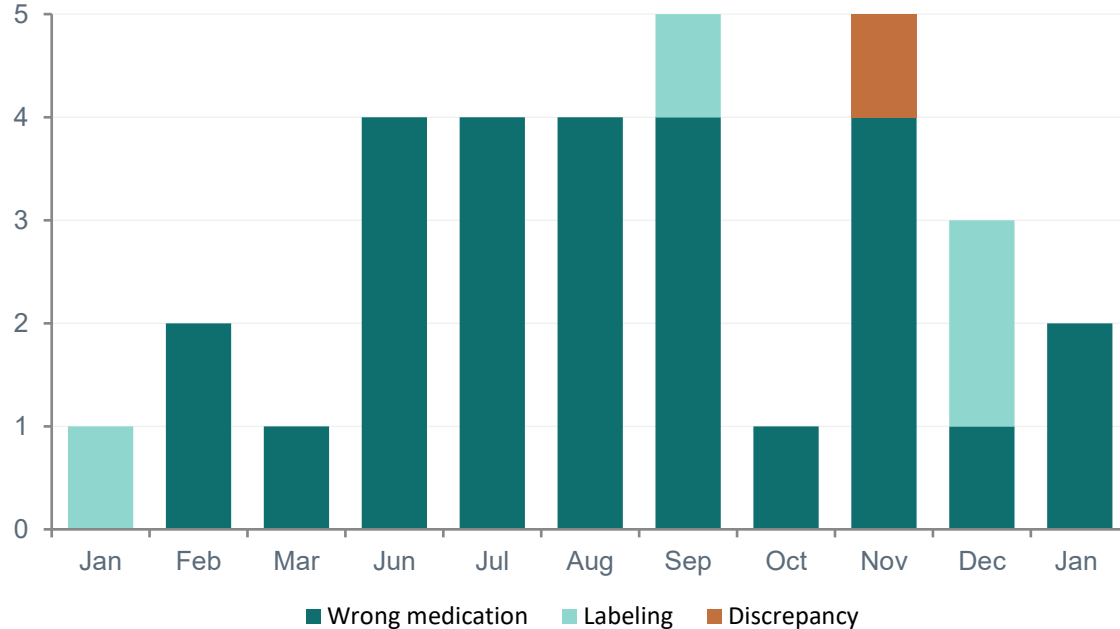
32

Reported events reviewed

13-month window

Every transaction is an opportunity for error. At roughly 0.02 events per 1,000 doses, the absolute rate is low — but at this volume small process variations still translate into real patient risk, which is why the team targeted the process, not the people.

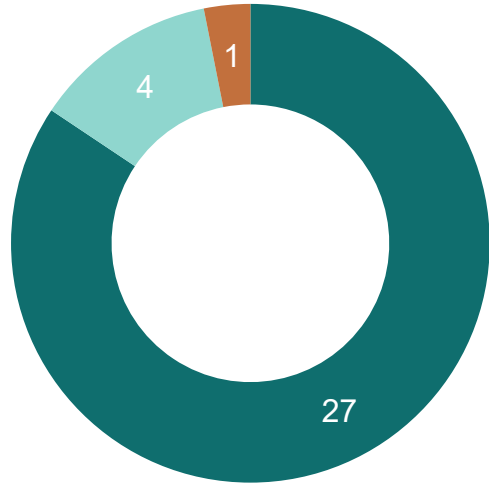
Reported Events, Jan–Jan Reporting Window



What the data shows

- 27 wrong-medication events
- 4 labeling events
- 1 discrepancy
- April and May were not reported — 11 months of data
- Events cluster after the July Pyxis go-live

84% of Events Involved the Wrong Medication



■ Wrong medication ■ Labeling ■ Discrepancy

The failure mode was clear

- 27 of 32 identified events were a wrong medication reaching the point of care.
- Labeling and discrepancy events were comparatively rare, pointing the team at the fill and return steps rather than at documentation.
- This focused the analysis on how medications are selected, separated, verified, and returned.

Voice of the Customer

51

Nurses

- Pyxis is fast and adds a safety check
- Wrong medications found in drawers
- Return practice varies — Pyxis vs. pharmacy

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Pharmacy technicians

- Processes not standardized
- Or standards are not known
- Reliance on tech-checks-tech

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Pharmacists

- Nursing should scan on dispense and return
- Minimal touchpoints, primarily first dose
- Fewer calls, meds more available

77 frontline voices shaped the problem statement.

MEASURE

What Direct Observation Found

- Individual medications were not always scanned separately
- Technicians were interrupted repeatedly during fill
- Work processes varied among staff
- Open carousel bins allow medications to cross into the wrong location
- Similar-looking vials sit adjacent to one another
- Barcode limitations generated workarounds
- Return processes were inconsistent, and Pyxis software does not support nursing scanning on return



Contributing Factors

20+ Pyxis machines and more than 100,000 doses were initially loaded without barcode capability during implementation, and carousel downtime forced manual pulls from crowded storage bins.

Technology

Barcode gaps at go-live; no nursing scan on return; workaround scanning of like-numbered barcodes.

Workflow

Uneven workload, frequent interruptions, and inconsistent adherence to fill and verification steps.

Environment

Open bins, adjacent look-alike vials, carousel downtime and crowded manual storage.

Standards

SOP standardization was incomplete, so practice varied by person and by shift.

Standardized Pyxis Replenishment



- Scan every medication — no batching by count
- Separate each medication for delivery
- Independent verification by a second technician or a pharmacist
- Handle one medication at a time during refill
- Confirm the medication in hand matches the screen and the existing pocket contents
- Report misfills as they are found
- Apply expiration-date controls at fill
- Assign defined responsibilities by shift

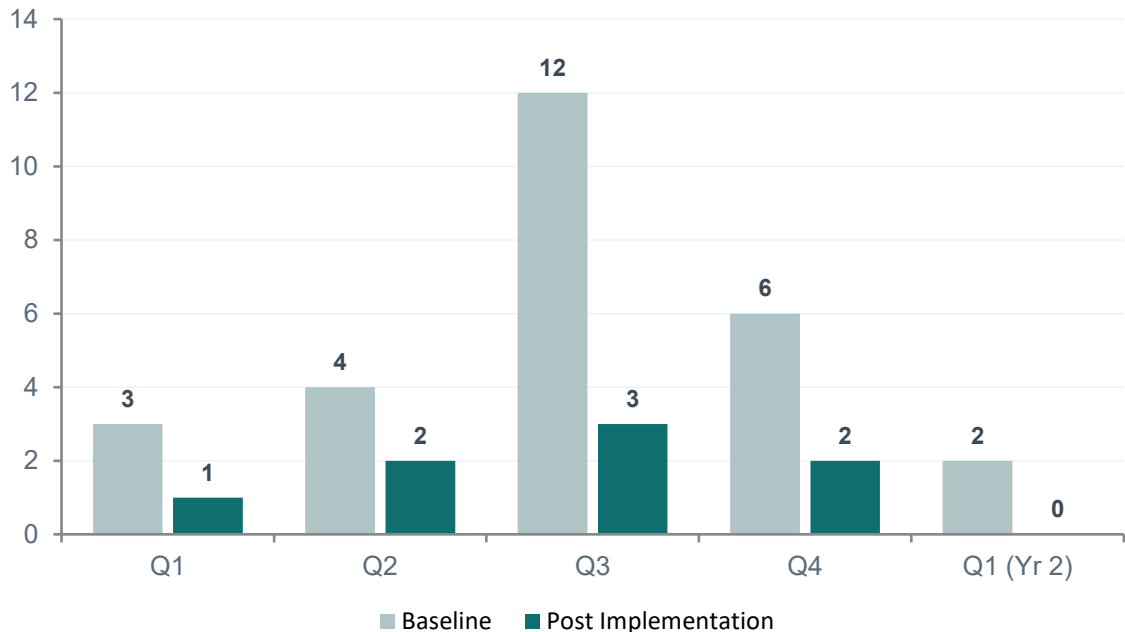
Cart Fill and Policy Control

- Scan the medication and its label at cart fill
- Physically separate medications to prevent mixing
- Independent verification of patient, drug, strength, and quantity
- Parallel Pharmacy PDSA work redesigned handling end to end

Revised policies were formally distributed.



Wrong Medication Events by Quarter



Improvement vs. baseline

- 27 baseline events vs. 8 post — a 70% reduction
- Matched Jan–Jan windows, before and after
- Q3 fell 12 to 3, the go-live quarter
- Q2 and Q1 (Yr 2) hold one month each
- Goal of zero not yet met

Executive Impact and Next Steps

- A medication discrepancy concern became an enterprise-level process review: data analysis, frontline VOC, direct observation, technology limitations, workflow redesign, policy standardization, independent verification, and leadership accountability.
- Results: wrong-medication events fell from 27 to 8 across matched Jan–Jan windows — roughly a 70% reduction — with the largest gain in Q3, the quarter containing the Pyxis go-live.
- The zero-discrepancy goal has not yet been met. Next: sustain the standard through shift-level accountability and monthly audit against the new SOPs.

Data note: the baseline window contains the July go-live, so part of the reduction reflects post-implementation stabilization as well as the redesign. Counts are small against ~1.5M annual doses, so a further 12 months of monitoring is needed to confirm the gain is sustained.