ASHP Best Practices Award

Transforming Data Into Insight: Establishment of a Pharmacy Analytics and Outcomes Team

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Authors have nothing to disclose.

Introduction

Healthcare Facility

- 11 hospital system
  - Size ranging from 900+ bed academic medical center to 25 bed critical access hospital
  - Includes multiple physician practice groups

Pharmacy Services

- Spans pharmacy departments across 11 entities
- Shared services support

Background

- Healthcare data volume is rapidly increasing
  - Accounts for approximately 30% of world's data[1]
- Pharmacy is one of the largest generators of
  - Medication procurement and inventory management
  - Operational and clinical workflows in acute and ambulatory settings
- Historically, data access
  - Was limited to reports in electronic health record (EHR)
  - Required significant manual chart review

Purpose

- Pharmacy Analytics and Outcomes (PAO) team was established to support tactical and strategic needs of clinical, financial, and operational pharmacy services
  - Charged with
    - Extending medication-use data insight to drive value-based patient care outcomes while
      - Decreasing waste
      - Optimizing therapeutic decisions
      - Achieving medication management standardization across continuum of healthcare
  - Goals
    - Establish enterprise-wide pharmacy data strategy
    - Create reporting and analytics infrastructure that produces data-driven insights for use

Description of Program

- Established 2013 with 0.5 full-time equivalent (FTE) pharmacist
- Grew to
  - 3 pharmacist FTEs
  - 6 business analyst FTEs
  - 0.2 pharmacy intern FTE
  - 1 biostatistician FTE
  - 1 pharmacy manager FTE

Description of Program *(continued)*

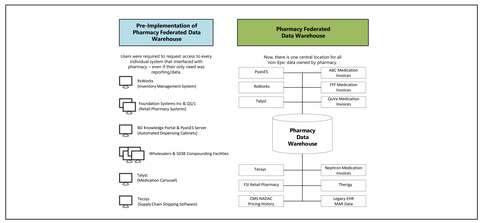
- Clinical and analytical skill sets
  - Pharmacists understand
    - Clinical nature of data
    - Complexities of medication-use process
  - Business analysts understand customer problems and needs through
    - Lens of analytic solutions
    - Skill set to support a data solution
- PAO team is a distinct team separate from
  - Epic Willow Team (part of Information Services Division [ISD])
  - Pharmacy informatics team (responsible for automation such as dispensing cabinets)
- PAO team grew to
  - Become subject matter experts for pharmacy and medication-related reporting and analytics
  - Provide consultative expertise to external teams leveraging medication-related data

Experience with the Program

Data Access

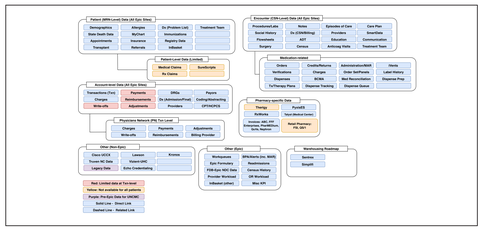
- 2014, partnered with Information Services Division to enhance centralized enterprise data warehouse
  - Multiple disparate data sources in addition to EHR
- 2016, established 2 pharmacy-centric data marts
  - One contains all medication-related EHR data
  - One contains warehoused non-EHR data sources, e.g.,
    - Automated dispensing cabinets
    - Carousels
    - Invoices

Pharmacy Federated Universe Warehouse Data Sources



- All data sources available to pharmacy end users

Pharmacy Guide to Available Data Sources



Experience with the Program *(continued)*

Data-Driven Decision Making

- Presence of PAO team led to culture of data-driven decision making
- Volume of data requests, recurring reports and dashboards, and analytics-driven projects has increased over recent years
  - PAO team currently supports over 150 recurring reports and dashboards
  - In fiscal year 2019, PAO team completed over 700 new data requests
    - 208% increase over past 3 years

Pharmacy System Data Governance (SDG)

- SDG structure developed in response to growth in system-level pharmacy reporting needs across all 11 entities
  - Prior, there were
    - No system reporting standards
    - No identified system standard Key Performance Indicators (KPIs) and metrics
- SDG allows PAO team to identify and prioritize system data analytics needs
  - Establish ownership for review of system reports and dashboards
  - Develop and formalize data definitions and KPIs to be used enterprise-wide
    - Enable internal pharmacy benchmarking
  - Provide support for analytics driven initiatives enterprise-wide

Pharmacist Accountability and Patient Outcomes

- Development of a Clinical Impact Committee
  - Co-led by PAO and Clinical leadership
  - Goal of demonstrating clinical pharmacist impact on Pharmacy Accountability Measures and organizational quality measures
- PAO team is leading effort to develop reporting on value care contract medication-related quality measures at the organizational level

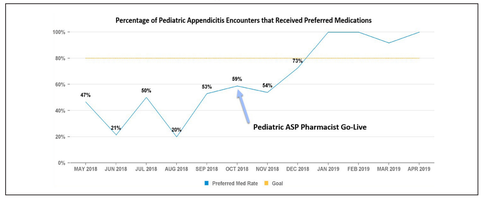
Select Outcomes

Example Data Assets Created and Maintained by the PAO Team

Data Asset Name	Background	Description & Intent of Asset	Significant Outcomes
Clinical			
INR Time in Therapeutic Range (TTR)	• Anticoagulation management is a cornerstone of ambulatory pharmacy practice • Pre-built reports available through the EHR typically have limitations, such as inability to compare between providers, and including inpatient INR values which can skew outpatient monitoring	• By partnering with anticoagulation clinic clinicians, the PAO team was able to develop a more accurate and precise report • This report also includes the patient's goal INR, and trends INRs out of range	• This report provides a value-based outcome measure for the clinic-based pharmacists, which is essential value demonstration • Similar reports have been developed for monitoring of lipid LDL and TC goals and appropriate use of high-intensity statins and PCSK9 inhibitors
Transitions of Care (ToC)	• In 2013, our academic medical center set an organizational and departmental goal of improving transitions of care for adult medicine patients • Pharmacy was a leader in medication history, admission medication reconciliation, and discharge medication reconciliation • Initial compliance reports were sent from external departments as raw data 30-45 days after the month end preventing real-time, targeted improvements and monitoring	• To close this gap, the PAO team partnered with clinical leaders to develop a dashboard that automatically published via email each Monday to all clinical pharmacists, showing service level performance from the previous week, including patient-level data on which patients were missed	• Through this dashboard, leaders were able to implement rapid PDSA cycles to improve transitions of care with real time data • Leaders were able to leverage this data to meet the departmental and organizational goal of 80% completion of TOC program activities for the targeted patient population
ASP – Pediatric Appendicitis	• As focus on antimicrobial stewardship (ASP) increases, pharmacy has been able to grow their presence by adding a pediatric ASP pharmacist. However, the majority of tools and reports available were focused on the adult population – very little stewardship had occurred in pediatrics	• The PAO team developed a pediatric appendicitis antibiotic guideline monitoring report • The report identifies all cases that did not use the hospital guideline-directed antibiotics	• Incorporation of this report into the ASP Pharmacist workflow has led to improvement in appropriate antibiotic utilization in pediatric appendicitis from 41% in quarter one of FY19 to over 95% in the last three months • This report allows us to show direct impact of the addition of a pediatric ASP pharmacist, as demonstrated in **Figure 3**

Experience with the Program *(continued)*

Figure 3



Data Asset Name	Background	Description & Intent of Asset	Significant Outcomes
Clinical			
Joint Commission (TJC) Medication Management (MM) Compliance Audit	• During previous TJC surveys several of our sites have been cited for failure to follow our policies surrounding Medication Management (MM) standard MM.04.01.01 Element of Performance Number 1 surrounding PRN therapeutic duplication and/or lack of infusion titration parameters on provider orders	• The System Clinical Pharmacy Committee worked to update policies and add appropriate infusion parameters to a majority of adult infusions. Our PAO team, via our partnership with ISD, developed two reports that help identify orders that did not follow institutional policy for therapeutic duplications and PRN duplicates	• These reports were established leading up to a triennial survey TJC visit at our academic medical center. Following this survey, our entity was not cited for either Medication Management standard, both of which we were cited for during our last TJC survey. This survey included over 80 patient tracers
Operations and Finance			
Pharmacy Operational Area Dashboards	• Prior to establishment of the PAO team, there were no consistency in tracking of metrics across operational area leaders. • This was either done through manual data collection (e.g., turnaround time) or through use of limited static reports available from the EHR	• The operational area dashboards allow the operational leadership (both pharmacist and technician) to identify opportunities to improve workflows and reduce waste • Dashboards break down appropriate productivity metrics by hour, including number of dispenses, verifications by centralized pharmacists, and number of medication messages processed by technicians	• These dashboards have been vital to the success of our frontline managers and supervisors • They provide performance information broken down to an hourly view to allow leadership to evaluate daily trends and adjust workload as necessary • A few examples of changes based on trends identified in the dashboards include adjustment of batch times and establishment of a project with nursing to improve clinic order release workflow
Charge Capture	• At our institution, very little information regarding financials were available to pharmacy managers until month-end processing was complete (near the 15th of the following month) • This resulted in managers having to be reactive to issues that may have been easier to fix as they arose	• The PAO team worked with the pharmacy business office and operational managers to establish daily reports showing the total charges dropped for the previous day within our EHR, and compares it to the amount budgeted for that day • It also tracks cumulative charges for the fiscal year compared to budgeted fiscal year • It allows managers to keep a pulse check on their cost centers to make sure there are no issues needing to be addressed	• One major outcome of the daily charge reports is that the analytics team was able to work with the infusion center manager to identify that charges were being incorrectly routed from the implementation of gravimetric workflow • We were able to catch this discrepancy within 48 hours of it occurring, which allowed the charges to be rerouted to the correct cost center, preventing major financial impact • This error resulted in a $1.5m revenue discrepancy that could not be rebilled in a previous scenario when PAO team was not involved
Specialty Pharmacy Services	• Our health care system's specialty pharmacy opened in 2013. • In the past 3 years, the PAO team has become integral to the operations and success of the specialty pharmacy through establishment of multiple dashboards and reports critical to the specialty pharmacy business	• The PAO team supports a host of data feeds and reports critical to the specialty pharmacy in all facets of their operation—financial tracking, operational productivity, access to limited distribution drugs/narrow payer networks, data purchase agreements, and compliance with accreditation standards • Our team has developed prescription capture reports that identify clinics generating a high volume of specialty prescriptions in order to strategically embed a clinic pharmacist or medication assistance program specialist to assist with coverage assistance and specialty capture	• The PAO team was vital to implementation of a standardized specialty pharmacy drug list (SPDL) that was aligned between operations, finance, and clinical practice • This has allowed our specialty pharmacy to better understand the value proposition of any given clinic's opportunity to partner with the specialty pharmacy • Additionally, the PAO team has closed accreditation compliance gaps by providing near real-time reporting of operational metrics such as call center time to answer

Discussion/Conclusion

- Full integration of the PAO team has resulted in placing actionable data in the hands of the decision makers and front-line staff to
  - Improve patient care
  - Streamline operations
  - Enhance cost savings and revenue generation
- By developing a comprehensive data management strategy to enhance dissemination of impactful, aggregated pharmacy data, pharmacy has been successful in significantly impacting decision-making processes while driving outcomes

References

1. Huesh MD, MosherTJ. Using it or losing it? The case for data scientists inside health care. In: NEJM Catalyst. https://catalyst.nejm.org/case-data-scientists-inside-health-care/ (accessed 2019 Oct 27).