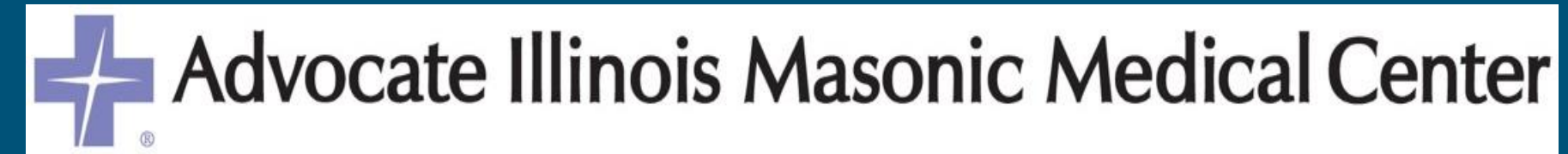


Conversion of Inhaler Therapy to Nebulized Respiratory Treatments: a Quality Improvement and Cost Reduction Program

Author: Edward J. Ashe, PharmD

Author Email: edward.ashe@advocatehealth.com

Department of Pharmacy - Advocate Illinois Masonic Medical Center (AIMMC)



We are AdvocateAuroraHealth



Background

- Impacts of an inhaler to nebulizer conversion program implemented at a large health system (Larson 2019)
 - Annual cost-savings of \$1,561,011 (38.5%)
 - No additional respiratory therapy labor required

INHALERS	NEBULIZERS
✗ High cost	✓ Reduced cost per unit
✗ Storage issues	✓ Equal efficacy
✗ Frequently lost	✓ Unit dose storage
✗ Drug waste after patient discharge	✓ Reduced waste with unit dose dispensing

Methods

- Single-site retrospective quality improvement analysis
 - Pre-Conversion Baseline: June 1, 2019 - June 30, 2019
 - Post-Conversion Trial Period: November 11, 2019 - December 31, 2019
- Reports captured total inhaled medication doses of all inhaler and nebulizer products for both timeframes
- Staff adherence was measured using a 10% sample of trial period formoterol orders, utilizing individual chart review to determine order compliance with conversion protocol requirements
- Staff efficiency and patient access to care were measured with the surrogate marker of inhaled medication requests
- All results were normalized to 30-day periods to facilitate comparison

Primary Outcome

- Medication Costs

Secondary Outcomes

- Respiratory Time Commitment
- Staff Adherence to Protocol
- Staff Efficiency
- Patient Access to Care

Figure 1: Outcomes

Discussion

- The conversion of inhaler therapy to nebulized equivalents resulted in a 29.8% reduction in inhaled medication expenditures
- An increase in inhaled therapy administrations occurred, but changes in standard administration times for nebulizers addressed the issue
- No additional respiratory staff was required
- Inhaled medication requests declined 47%, reducing delays in dose administrations for patients and reducing time wasted by staff members to process requests

Study Limitations

- Data collection time periods were from different seasons of the same year
- Functionality and capabilities of the data collection reports used for this project were limited
- Surrogate endpoint usage may limit the extrapolation of secondary outcome results

Practice Implications

- As a result of the pilot program, formulary changes to respiratory medications and adjustments in respiratory workflow will be implemented at AIMMC
- Full roll-out of standardized inhaler to nebulizer conversion across Advocate Aurora Health to be discussed going forward

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Disclosure of Relevant Financial Relationships

Authors of this presentation disclose the following relationships with commercial interests related to the subject of this poster
Ed Ashe: Nothing to disclose

AIMMC Site Specific Practices

- At AIMMC, inhaled medications are administered to patients by respiratory therapists
- Respiratory and pharmacy staff both report to the same director
- Historically, the AIMMC formulary consisted of both nebulized and inhaled medications
- Inhalers were primarily stored in central pharmacy and dispensed to units when ordered, leading to:
 - Delays in therapy
 - Missing doses
 - Staffing inefficiency
- Inhaler product waste also occurred due to destruction of inhalers with viable doses remaining

AIMMC Conversion Protocol Implementation

- On November 11th 2019, pharmacists manually converted inhaler orders to the following therapeutically equivalent formulary nebulizers:
 - Albuterol Neb
 - Ipratropium Neb
 - Ipratropium/Albuterol Neb
 - Budesonide Neb
 - Formoterol Neb
- Inclusion criteria: adult in-patients
- Exclusion criteria: pediatrics, procedural areas, cystic fibrosis, inpatient psych, active labor

Objective

To evaluate the site nebulizer pilot program's impact on pharmacy and respiratory department efficiency, patient care, and medication costs

Results

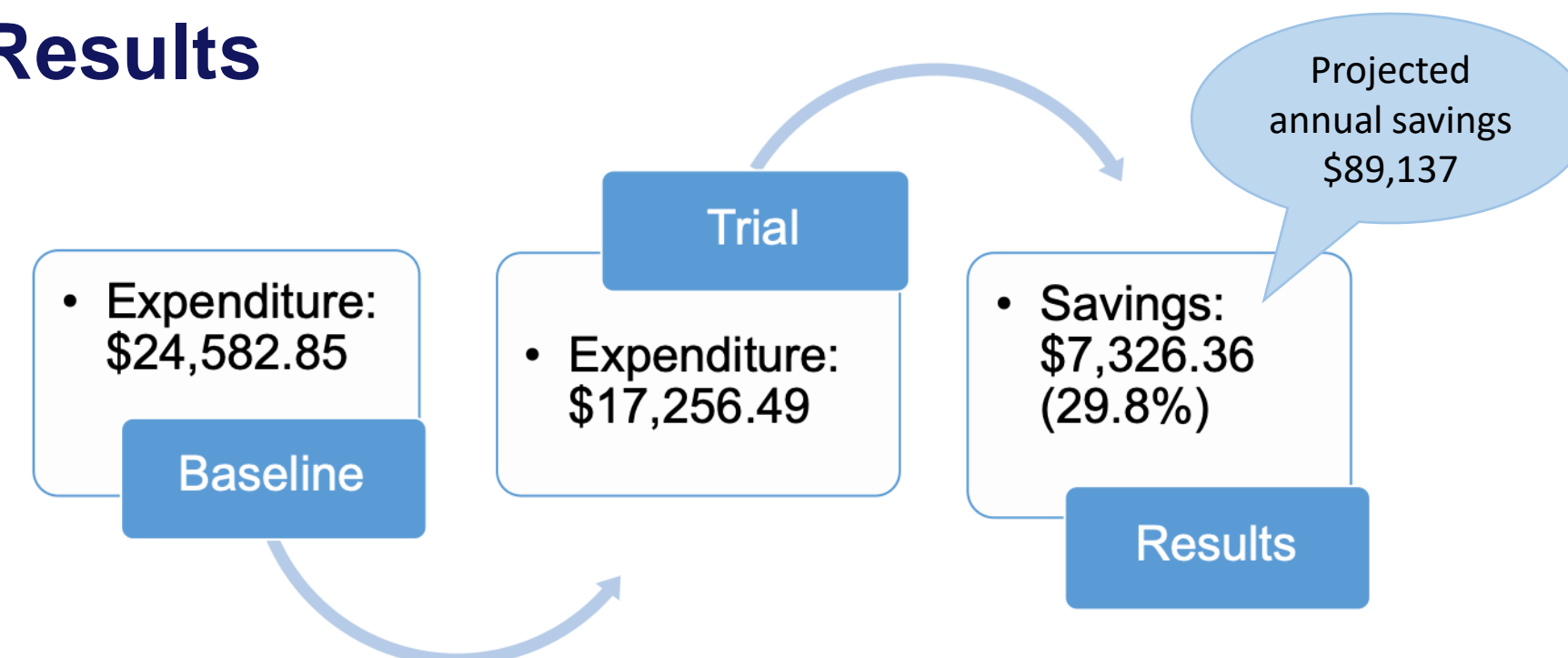


Figure 2: Medication Costs (30-Day)

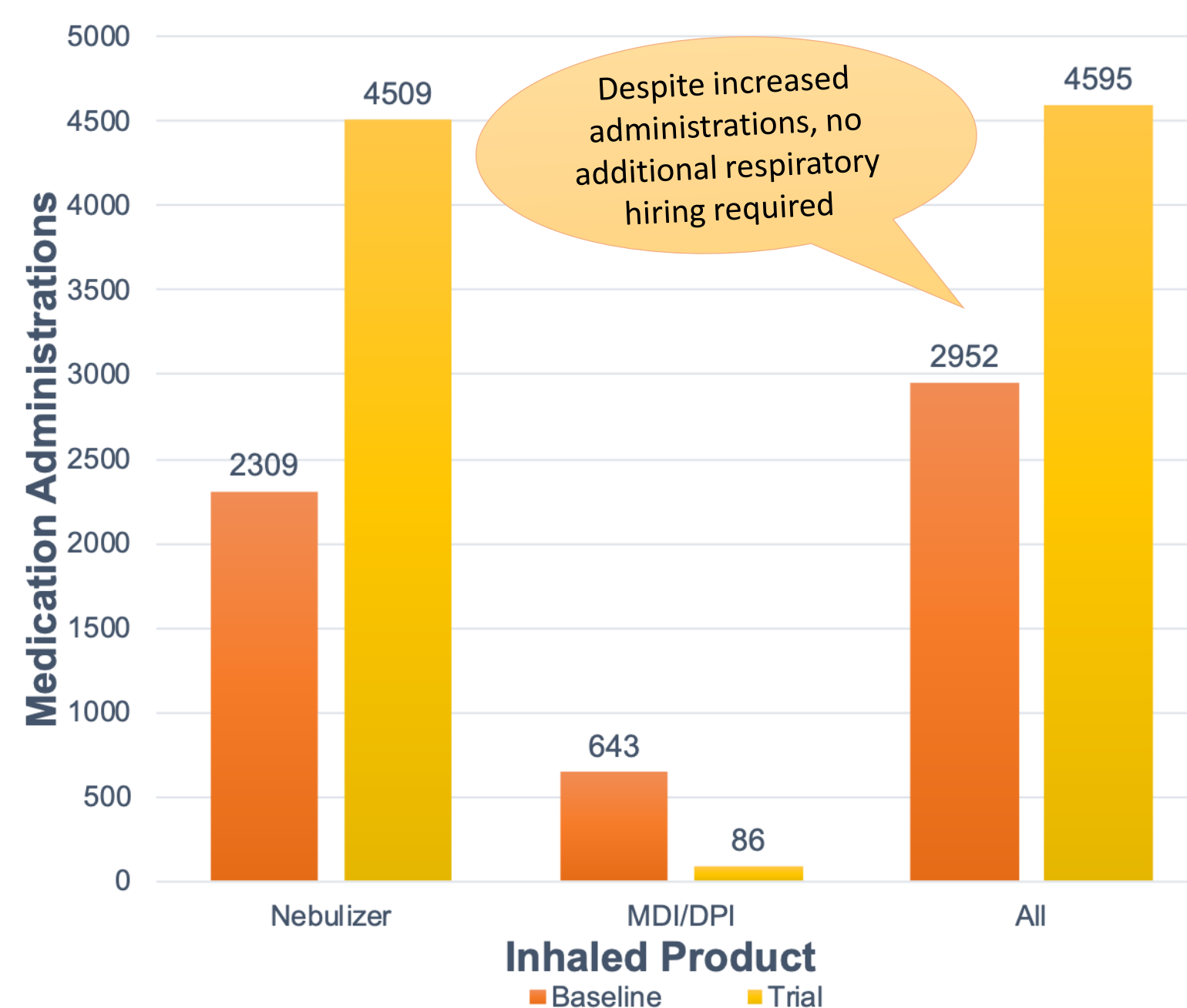


Figure 4: Respiratory 30-Day Workload

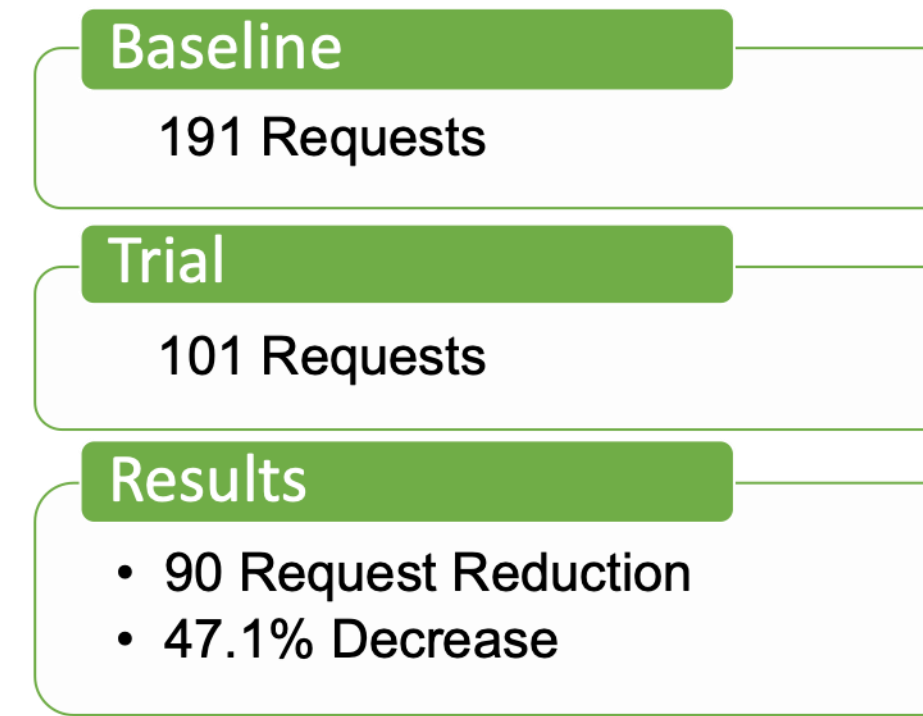


Figure 3: Inhaled Medication Requests (30-Day)

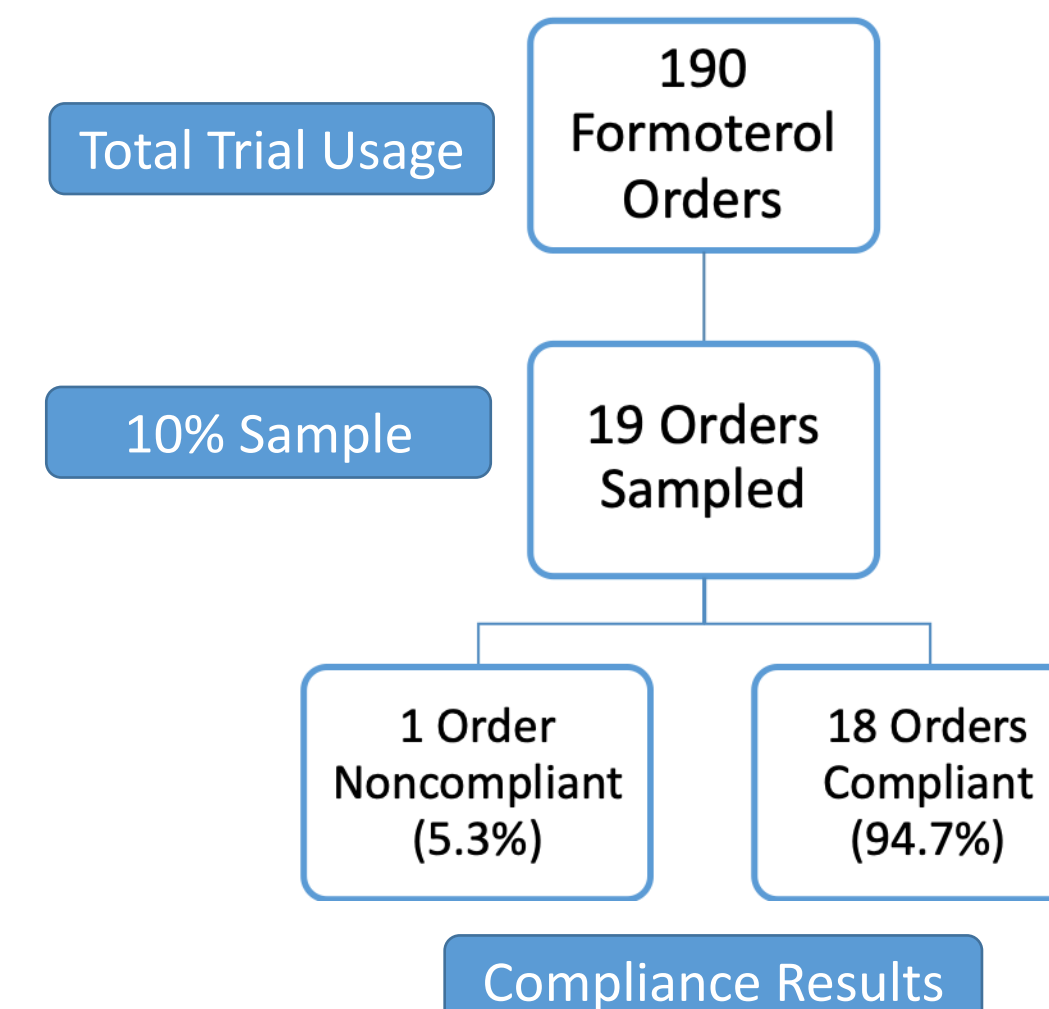


Figure 5: Protocol Adherence