Effectiveness of a Standardized Care Bundle on 60-day Utilization among Patients Hospitalized with an Acute Exacerbation of COPD

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Background

- COPD is the **third leading cause of death** in the USA
  - 3-year mortality 11-24%
- Incurable
- **Treatment available** for most aspects of disease

- Often undiagnosed (~ 30% at time of initial hospitalization)
- Incorrectly diagnosed (up to 80% empirically diagnosed without spirometry)
- Disproportionally affects elderly, poor, less educated

- Exacerbation frequency 0.7 - 2.0 per year
- Hospitalization frequency 0.1 - 0.5 per year
  - ~ 20% 30 day readmission rate
  - ~ 50% 12 month readmission rate
- Majority of **cost of care** for population due to
  - AECOPD and hospitalizations
Background

Best practice standards for management of COPD have been defined and published. However, there is variable adherence to these guidelines.

It is unclear if systematic adherence to these guidelines, with a focus on patients hospitalized for an acute exacerbation of COPD (AECOPD), will result in improvement in health care utilization.

We have designed a study to evaluate the impact of a complex COPD Clinical Pathway on 60 day acute care utilization.

- Atrium IRB submitted
- HIIN funding with service line and quality division support
- Stakeholder engagement (Atrium Executive, Readmissions, Appropriate Care, Clinical Optimization)
Appropriate Care for COPD

- Correct and Accurate Diagnosis
- Prevention/Trigger Management
- Patient and Caregiver Education
- Appropriate Pharmacologic Therapy
- Pulmonary Rehabilitation
- Comorbidity Management
- Care Access, Management, and Transition
Building the COPD Framework

- **Best practice order sets and pathways** for all venues founded on GOLD guidelines

- COPD-specific **transition communication tool** between venues

- Development of **COPD Data Mart** and **Scorecard** for disease-related, symptom-related, and utilization-related outcomes

- **Expansion** of geography
Improvement Process

The planning and designing of the COPD clinical pathway occurred at CMC – Mercy

Pulmonology, respiratory, hospital medicine, and other key stakeholders partnered with the Lean team and Performance Improvement team to develop a structured pathway for COPD patients based on best clinical practices and available evidence

This pathway was piloted at CMC-Mercy with positive results and used to create a workflow design for each hospital

To provide additional rigor and remove biases in evaluating the impact of the bundle, an IRB approved research protocol was developed to implement and assess outcomes from the work
## Intervention Components

- Guidelines to determine observation or admission
- Pharmacologic bundle of systemic steroids, antibiotic and RT-driven bronchodilator protocol
- RT educator/navigator
- Pulmonary rehab assessment/referral
- Care management consult
- Discharge recommendations
  - Complete steroid/antibiotics
  - Long and short acting bronchodilator
  - Physician follow-up within 7 days
The Intervention

Patient identification within first 24 hours of admission

A standard clinical pathway for management of patients admitted to hospital with AECOPD
  - Verification of diagnosis, patient/caregiver education, standardized medication regimen, vaccination, smoking cessation, care management assessment and intervention, standards for pulmonary and palliative care consultation, discharge checklist, schedule follow-up appointment

Patient navigation services and daily multi-professional review of care gaps ("huddle")

Monthly outcome review with leadership
Primary Aim

Goal:
Decrease post-hospitalization acute care encounters by using an evidence based standardized "bundle" for patients admitted with AECOPD

- Encounters includes an inpatient, observation or ED stays
- Acute care utilization within 60 days was chosen over the more commonly reported 30-day readmission outcome in part to prepare for the need to look further than 30 days as we move into value-based contracts
Randomized Trial Design

**Methods**

- A randomized stepped-wedge design was used to assess the COPD pathway
- A list was generated daily identifying patients with an acute exacerbation of COPD (AECOPD) and their gaps in care
- Eight primary enterprise hospitals participated from April 9, 2017 through February 11, 2018
- Outcomes were assessed among adults ≥ 40 years of age who had a billing diagnosis of AECOPD (ICD-10: J44.1). This includes primary and secondary diagnoses
Daily Patient Identification

- Patients ≥ 40 years of age at time of admission
- Use of COPD PowerPlan or
- Respiratory therapy navigation notification or
- Respiratory therapist use of the COPD department protocol or
- Historical diagnosis of COPD and order of systemic steroids or
- COPD diag in nursing documentation and order of systemic steroids or
- COPD on existing problem list and order of systemic steroids
- Systemic steroids (po or iv, prednisone or methylprednisolone)
Patient Population

4,832 Patient encounters

2,353 Encounters where the COPD Pathway had been implemented

2,479 Usual care

1,945 Unique patients

1,913 Unique patients

Average age: 67 years
73% Medicare
14% Medicaid
9% Commercial

91% Inpatient encounters

79% Caucasian
19% African American
44% Male

4 days – Median Length of Stay
Results

60-day all cause, non-elective acute care utilization (IP, OBS, ED) to any Atrium hospital

- **COPD Pathway:** 39.1%
- **Usual Care:** 43.6%
- **OR:** 0.80 (0.64-0.99)
- **p:** 0.041

- **COPD PowerPlan**
- **COPD Pathway:** 65.9%
- **Usual Care:** 45.1%
- **OR:** 2.35 (2.10-2.64)
- **p:** <0.001

- **COPD Bronchodilator Protocol**
- **COPD Pathway:** 72.3%
- **Usual Care:** 45.9%
- **OR:** 3.07 (2.73-3.46)
- **p:** <0.001

- **Completed follow-up appointment within 7 days of discharge at Atrium Health**
- **COPD Pathway:** 22.1%
- **Usual Care:** 28.2%
- **OR:** 0.72 (0.63-0.82)
- **p:** <0.001
Daily “real time” identification of AECOPD patients helps focus application of pathway and care standards by all providers.

Review of process compliance by daily huddle (with RT, RN, Process Improvement Coordinator, +/- others) helps ensure adherence to treatment standards and identify gaps in care delivery process.

If positive outcomes achieved, apply process to other chronic diseases prone to exacerbation (i.e. CHF) or to complex chronic patients.

Repeated personalized communication with providers is necessary to change workflow.

Process mapping has improved efficiency of care delivery.
Thank You all for your help in the roll out and implementation of the COPD clinical pathway

Respiratory Health Service Line, Performance Excellence Center (Lean), quality division, CORE (research) and hospital medicine teams (Departments of Internal Medicine, CHG, and Elizabeth Family Medicine)