Discharge and Transitional Care of Patients with COPD: Improving Practice to Reduce Readmissions

Faculty Panel

Sidney Braman, MD
Professor of Medicine
Pulmonary, Critical Care, and Sleep Medicine
Icahn School of Medicine
New York, New York

Joshua LaBrin, MD, FACP, SFHM
Assistant Professor of Medicine
University of Utah School of Medicine
Salt Lake City, Utah
Faculty Disclosures

- Sidney Braman, MD
  - Royalties: AP Press, Guilford Press

- Joshua LaBrin, MD, FACP, SFHM
  - No real or apparent conflicts of interest to disclose

Learning Objectives

- Assess future risk for worsening disease and exacerbations in patients with chronic obstructive pulmonary disease (COPD) to prevent hospital readmission

- Provide individualized discharge and transitional care plans for patients at high risk who were recently hospitalized for COPD
Overview of Topics Covered

- COPD in the hospital setting
- Assessment and treatment of COPD exacerbations
- Assessing COPD severity & future risk
- Considerations for maintenance therapy in the hospital setting
- Device selection
- Discharge & transitional care planning
- Additional strategies to prevent hospital readmissions

COPD in the Hospital Setting
Estimated 15 million people in the US diagnosed with COPD
However, lung function tests show that up to twice as many people may have COPD, but are undiagnosed
Many patients who present with an exacerbation for the first time and are treated in the hospital were previously undiagnosed

1.5 million emergency department (ED) visits
699,000 hospital discharges
Over $13 billion in hospital care costs
In-hospital mortality 2.5% for all hospital admissions from acute exacerbations of COPD, and up to 28% for patients requiring mechanical ventilation
Rates of Repeat ED Visits and Readmissions

A substantial proportion of patients discharged for COPD are readmitted or have repeat ED visits within 30 days.

- ED visits
- Simple inpatient admissions
- Complex inpatient admissions

Patients ≥40 years of age
Medicare accounted for 66.4% of all encounters.

Quality of Care and Unstable Comorbidities Contribute to Readmissions

- Patients hospitalized for COPD exacerbations received only about 50% of the care recommended by guidelines¹
- Specific gaps related to instruction on respiratory inhalers and scheduling a follow-up appointment²
- Majority of readmissions within first 30 days are related to comorbidities including cardiac, renal, gastrointestinal, and infectious conditions³

Goals of the Healthy People 2020 Program (US DHHS)
- Increase diagnosis of COPD
- Improve activity level in patients with COPD
- Reduce ED visits, hospitalizations, and deaths

Updates to CMS Readmissions Reduction Program
- CMS will reduce payments to hospitals for COPD readmissions within 30 days
- Maximum penalty at 3% of a hospital's Medicare reimbursement

Policies on Hospitalizations/Readmissions for COPD

Goals for In-hospital Management of COPD

- Assess & treat exacerbation to stabilize patient
- Implement individualized inpatient treatment plan
- Assess risk for future exacerbations
  - Evaluate COPD severity
  - Evaluate patient comorbidities
- Evaluate current medical management and home care environment
- Implement individualized discharge and transitional care plans to prevent readmission to include long-acting maintenance therapies and follow-up
Exacerbation of COPD

An exacerbation of COPD is an acute event characterized by a worsening of the patient’s respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication.

Impact of Frequent COPD Exacerbations

- Patients with frequent exacerbations
- Lower quality of life
- Increased inflammation
- Faster disease progression
- Increased mortality rate
- Increased risk of recurrent exacerbations
- Increased likelihood of hospitalization

Most Frequent Causes of an Exacerbation

- 70% to 80% of COPD exacerbations are triggered by viral or bacterial respiratory infections
- 20% to 30% are associated with exposure to environmental pollution or have an unknown etiology

Case Study #1: 62-year-old Female

History
- Current smoker with 35 pack-year history
- Current diagnosis of COPD by primary care physician

Current medications
- LAMA maintenance therapy and SABA prn
- Forgets to take her second inhaler sometimes

Presentation
- Cough and dyspnea while walking over the last several hours
- Used rescue inhaler 4 times in last 2 hours

LAMA, long-acting anticholinergic; SABA, short-acting \( \beta_2 \)-agonist; prn, as needed.
Case Study #1: Exam and Test Results

- Persistent productive cough with clear, white sputum
- Physical exam
  - Wheezing and decreased breath sounds on lung exam
  - Temperature: 99.7
  - HR: 82
  - BP: 143/91
- SpO2: 79% on room air
- Imaging and laboratory testing negative for bacterial pneumonia
- Poor response to first dose of SABA

HR, heart rate; BP, blood pressure; SpO2, oxygen saturation.

Hospital Care Pathway for COPD: Initial Presentation in the ED

Point of Entry ED (self-admitted or clinician referral) → Assess Severity of Exacerbation → Implement/Modify Therapy to Treat Acute Symptoms → Consider admission criteria

Diagnostic Options
- Arterial blood gases, pulse oximetry
- Chest X ray, ECG
- Other

Therapeutic Options
- Modify bronchodilator therapy
- Systemic steroids
- Antibiotic therapy?
- Consider NIV
- Other

ECG, electrocardiogram; NIV, noninvasive ventilation.
Slide courtesy of: Stanley B. Fiel, MD.
Confirm the Diagnosis of COPD Exacerbation

<table>
<thead>
<tr>
<th>History</th>
<th>Physical Exam</th>
<th>Diagnostic Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnosis of COPD</td>
<td>Wheezing on lung exam</td>
<td>SpO₂ &lt;88% on room air</td>
</tr>
<tr>
<td>Cigarette smoking</td>
<td>Decreased breath sounds</td>
<td>Abnormal chest X ray</td>
</tr>
<tr>
<td>Dyspnea on ordinary exertion, shortness of breath at rest</td>
<td>Use of accessory muscles</td>
<td>Hyperinflation on chest imaging</td>
</tr>
<tr>
<td>Cough, phlegm</td>
<td>Pursed-lip breathing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hyperinflation</td>
<td></td>
</tr>
</tbody>
</table>


Risk Factors for In-hospital Mortality

- Characteristics indicative of exacerbation severity (eg, abnormal blood gas values)
- Case severity (complications, organ system dysfunction, severe COPD)
- Older age
- Comorbid conditions (number and type)

Corticosteroids Given in the Hospital

TF: Death from any cause or the need for intubation and mechanical ventilation, readmission because of COPD, or intensification of pharmacologic therapy.

Readmissions for COPD were similar across all groups at 30 days.

Rate of Treatment Failure (%)

Month

Glucocorticoids, 8 wk
Glucocorticoids, 2 wk
Placebo

5-day Course of Corticosteroids Preferred for COPD Exacerbations

- GOLD Stage 3-4
- FEV₁ ~31% predicted
- Randomized to 5 or 14 days of prednisone (40 mg)
- 5-day regimen non inferior to 14-day regimen
- Hospital stays averaged 1 day shorter with 5-day regimen

GOLD, Global Initiative for Chronic Obstructive Lung Disease; FEV₁, forced expiratory volume in 1 second.

Antibiotic Therapy Recommended for Patients with Infectious Exacerbation

- Retrospective study of patients >40 years old hospitalized for a COPD exacerbation and treated with systemic corticosteroids (N=53,900)
- Addition of antibiotics was associated with:
  - 40% reduction in in-hospital mortality
  - 13% reduction in 30-day readmission for COPD


Summary of Exacerbation Management

- Assess severity of symptoms, chest radiograph, blood gases, and/or O₂ saturation to guide management
- Provide O₂ as indicated
- Consider NIV/IMV and criteria for admission if necessary
- Provide bronchodilator therapy
  - Increase doses/frequency of SABA therapy
  - Combine SABAs with anticholinergics
  - Use spacers or air-driven nebulizers
- 5-day course of oral corticosteroids preferred
- Consider antibiotics for infectious exacerbations
- Consider adjunctive therapies as necessary

IMV, invasive mechanical ventilation.
Assessing COPD Severity & Future Risk

Estimation of COPD Severity Not Always Aligned with Objective Measures

- COPD severity is underestimated in ~50% of patients when measured clinically compared with severity derived by spirometry
- Spirometry resulted in a change in treatment in ~33% of patients

Severity of COPD Symptoms: Classification Using Spirometry

<table>
<thead>
<tr>
<th>Category</th>
<th>Severity</th>
<th>Spirometry (% predicted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD 1</td>
<td>Mild</td>
<td>FEV₁ ≥80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FEV₁/FVC &lt;0.70</td>
</tr>
<tr>
<td>GOLD 2</td>
<td>Moderate</td>
<td>50%≤ FEV₁ &lt;80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FEV₁/FVC &lt;0.70</td>
</tr>
<tr>
<td>GOLD 3</td>
<td>Severe</td>
<td>30%≤ FEV₁ &lt;50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FEV₁/FVC &lt;0.70</td>
</tr>
<tr>
<td>GOLD 4</td>
<td>Very severe</td>
<td>FEV₁ &lt;30%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FEV₁/FVC &lt;0.70</td>
</tr>
</tbody>
</table>

FVC, forced vital capacity.

Association of Disease Severity with Frequency of COPD Exacerbations

ECLIPSE STUDY

Hospitalized for exacerbation in year 1
Frequent exacerbations

<table>
<thead>
<tr>
<th>Category</th>
<th>Patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD 2 (N=945)</td>
<td>7, 22</td>
</tr>
<tr>
<td>GOLD 3 (N=900)</td>
<td>18, 33</td>
</tr>
<tr>
<td>GOLD 4 (N=293)</td>
<td>33, 47</td>
</tr>
</tbody>
</table>

ECLIPSE, Evaluation of COPD Longitudinally to Identify Predictive Surrogate Endpoints.
Risk Evaluation in COPD: Potential for Serious Events by Disease Severity

<table>
<thead>
<tr>
<th>Category</th>
<th>Exacerbations Per Year</th>
<th>Hospitalizations Per Year</th>
<th>3-year Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>GOLD 1</td>
<td>?</td>
<td>?</td>
<td>?</td>
</tr>
<tr>
<td>GOLD 2</td>
<td>0.7 - 0.9</td>
<td>0.11 - 0.2</td>
<td>11%</td>
</tr>
<tr>
<td>GOLD 3</td>
<td>1.1 - 1.3</td>
<td>0.25 - 0.3</td>
<td>15%</td>
</tr>
<tr>
<td>GOLD 4</td>
<td>1.2 - 2.0</td>
<td>0.4 - 0.54</td>
<td>24%</td>
</tr>
</tbody>
</table>


Assessment of COPD Severity and Risk: Exacerbation History and Symptoms

- Exacerbation history
- Modified Medical Research Council Dyspnea Scale
  - Assesses severity of patient breathlessness
  - 5 grades: 0 no breathlessness to 4 very severe
- COPD Assessment Test (CAT)
  - 8-question assessment that assigns a score of 1 to 5 to each question
  - Measures frequency of symptoms
  - Higher scores denote a more severe impact of COPD on a patient's life

mMRC and CAT have been validated and relate well to other measures of health status and predict future mortality risk.

COPD Assessment Test is a trademark of the GlaxoSmithKline group of companies.
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Risk Assessment of COPD: Updated GOLD Guidelines

Risk GOLD Classification of Airflow Limitation

- 4 <30%
- 3 30%-50%
- 2 50%-80%
- 1 ≥80%

Symptoms (mMRC or CAT score)

- mMRC 0-1
  - CAT < 10
- mMRC ≥2
  - CAT ≥10

Exacerbation History

Risk

- (C) ≥2
- (A) 1
- (B) 0

Best Predictor of Future Exacerbation: Exacerbations in Past Year

ECLIPSE STUDY

<table>
<thead>
<tr>
<th></th>
<th>Odds Ratio (≥2 vs 0)</th>
<th>P value</th>
<th>Odds Ratio (1 vs 0)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exacerbations during the past year</td>
<td>5.72</td>
<td>&lt;.001</td>
<td>2.24</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>


Risk Factors for COPD Exacerbations

- Continued exposure to:
  - Cigarette smoke
  - Industrial particulates
  - Indoor/outdoor pollution
- Worsening symptoms (dyspnea, cough, and secretions)
- Declining lung function
- Viral upper respiratory infections
- Increase in rescue medication use
- Maintenance medication nonadherence
- Poor device technique and inadequate medication administration
- Previous exacerbation/hospitalization

CHF, congenital heart disease; GERD, gastroesophageal reflux disease; PVD, peripheral vascular disease; CHF, congestive heart failure.

The majority of patients with COPD exhibit ≥3 comorbidities.

A subset of these have been associated with ↑ likelihood of disease progression and readmission for exacerbation:

- CHF
- Lung cancer
- Anxiety
- Depression
- Skeletal muscle weakness
- Osteoporosis

Impact of Comorbidities on Disease Progression and Future Exacerbations


Mortality Risk Within the First 30 Days Following Initial Discharge for COPD

Considerations for Maintenance Therapy in the Hospital Setting

- In post discharge setting, patients with delayed maintenance therapy had a 43% ($P<.001$) higher risk of future hospitalization/ED visit$^1$
  - Every 30-day delay associated with 9% increase in risk ($P=.002$)

- Patients with COPD with higher adherence to prescribed maintenance regimens experienced fewer hospitalizations and lower Medicare costs$^2$

- Should we consider advancing the initiation of maintenance therapies to the hospital setting?

Hospital Stays for Exacerbations of COPD Following Initiation of LAMA

- Early addition of maintenance LAMA (tiotropium) to a respiratory-therapist-directed bronchodilator protocol for patients hospitalized for COPD exacerbation reduced:
  - Hospital stays
  - Hospital costs
  - No safety concerns


Odds of Readmission 31% Lower When Nebulized LABA Initiated in Hospital

Overall, significantly lower (8.7% vs 11.9%) 30-day readmissions with arformoterol

Initiating LABA Therapy in Outpatient Setting Lowers Risk of All-cause Hospitalization

- 26% reduction in hospitalizations with LABA vs SABA in 6-month follow-up period


Combined Assessment of COPD: Updated GOLD Guidelines

GOLD Recommendations for Initial Pharmacotherapy

<table>
<thead>
<tr>
<th>Patient Group</th>
<th>Recommended First Choice</th>
<th>Alternative Choice</th>
<th>Other Possible Treatments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>SAMA prn or SABA prn</td>
<td>LABA or LAMA or SABA + SAMA</td>
<td>Theophylline</td>
</tr>
<tr>
<td>B</td>
<td>LAMA or LABA</td>
<td>LAMA + LABA</td>
<td>SABA and/or SAMA Theophylline</td>
</tr>
<tr>
<td>C</td>
<td>ICS + LABA or LAMA</td>
<td>LAMA + LABA or LAMA + LABA or LAMA + PDE4</td>
<td>SABA and/or SAMA Theophylline</td>
</tr>
<tr>
<td>D</td>
<td>ICS + LABA and/or LAMA</td>
<td>ICS + LABA or LAMA + LABA or ICS + LABA + PDE4 or LABA + LABA or LAMA + PDE4</td>
<td>Carbocysteine SABA and/or SAMA Theophylline</td>
</tr>
</tbody>
</table>

SAMA, short-acting muscarinic antagonist; ICS, inhaled corticosteroid; PDE4, phosphodiesterase type 4 inhibitor.


Available Long-acting Bronchodilator Monotherapies

<table>
<thead>
<tr>
<th>Agent</th>
<th>Delivery</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LABA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arformoterol</td>
<td>Nebulizer</td>
<td>Sunovion</td>
</tr>
<tr>
<td>Formoterol</td>
<td>Nebulizer</td>
<td>Mylan</td>
</tr>
<tr>
<td>Indacaterol</td>
<td>DPI</td>
<td>Merck</td>
</tr>
<tr>
<td>Oloclaterol</td>
<td>DPI</td>
<td>Boehringer Ingelheim</td>
</tr>
<tr>
<td>Salmeterol</td>
<td>DPI</td>
<td>GlaxoSmithKline</td>
</tr>
<tr>
<td><strong>LAMA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aclidinium</td>
<td>DPI</td>
<td>Forest</td>
</tr>
<tr>
<td>Ipratropium</td>
<td>IA</td>
<td>Boehringer Ingelheim</td>
</tr>
<tr>
<td>Tiotropium</td>
<td>DPI, IS</td>
<td>Pfizer/Boehringer Ingelheim</td>
</tr>
<tr>
<td>Umeclidinium</td>
<td>DPI</td>
<td>GlaxoSmithKline</td>
</tr>
</tbody>
</table>

DPI, dry powder inhaler; SMI, soft mist inhaler; IS, inhalation spray; IA, inhalation aerosol.

Reduction in Exacerbations with LAMA Therapy (UPLIFT Study)


14% reduction in exacerbations and significant delay in the time to the first exacerbation (16.7 months vs 12.5 months).

Hazard ratio, 0.86 (95% CI, 0.81-0.91) \( P<0.001 \)

Pooled Long-term Safety Data for Tiotropium for COPD

- Pooled safety data from 35 placebo-controlled trials of tiotropium for COPD
- 24,555 patients and 14,909 patient-years of exposure to tiotropium
- Regardless of device, tiotropium does not increase the overall risks of AEs, SAEs, FAEs, or CV events

AE, adverse event; SAE, serious adverse event; FAE, fatal adverse event; CV, cardiovascular.

Nebulized LABA Results in Greater Lung Function vs Placebo (12 Weeks)

![Graph showing change in FEV1 (mL) over time after study drug administration.](image)

- Drug administered:
  - Arformoterol 15 µg bid
  - Arformoterol 25 µg bid
  - Arformoterol 50 µg qd
  - Salmeterol 42 µg bid
  - Placebo

- Change in FEV1 (mL) vs Time After Study Drug Administration (hr)
  - Time: 0, 2, 4, 6, 8, 10, 12, 22, 24
  - Change in FEV1: -100, -50, 0, 50, 100, 150, 200, 250, 300, 350, 400

- Patients were ≥ 40 years of age
- Baseline:
  - FEV1 ≤ 65% predicted, FEV1 > 0.50 L, FEV1/FVC ≤ 70%
  - ≥ 15 pack-year smoking history
- COPD exacerbation-related hospitalizations were 9.0% (arformoterol) vs 14.3% (placebo)
- Risk for first respiratory SAE was 50% lower with arformoterol with placebo (P=.003)
- Overall, arformoterol had an approximately 40% lower risk of respiratory death or COPD exacerbation-related hospitalization over 1 year vs placebo


1-year Safety of Nebulized LABA Therapy (Arformoterol) vs Placebo

- Patients were ≥ 40 years of age
- Baseline:
  - FEV1 ≤ 65% predicted, FEV1 > 0.50 L, FEV1/FVC ≤ 70%
  - ≥ 15 pack-year smoking history
- COPD exacerbation-related hospitalizations were 9.0% (arformoterol) vs 14.3% (placebo)
- Risk for first respiratory SAE was 50% lower with arformoterol with placebo (P=.003)
- Overall, arformoterol had an approximately 40% lower risk of respiratory death or COPD exacerbation-related hospitalization over 1 year vs placebo

Available Long-acting Bronchodilator
LABA/LAMA Combination Therapies

<table>
<thead>
<tr>
<th>AGENT</th>
<th>DELIVERY</th>
<th>MANUFACTURER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vilanterol + umeclidinium</td>
<td>DPI</td>
<td>GlaxoSmithKline/Theravance</td>
</tr>
<tr>
<td>Olodaterol + tiotropium</td>
<td>SMI</td>
<td>Boehringer Ingelheim</td>
</tr>
</tbody>
</table>


LABA/LAMA Combination Associated with Reduced Risk for Exacerbations

![Graph showing percentage of patients with exacerbations](image)

- ~50% reduction in exacerbations overall and exacerbations resulting in hospitalizations

Available Long-acting Bronchodilator Therapies in Combination with ICS

<table>
<thead>
<tr>
<th>Agent</th>
<th>Delivery</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formoterol + budesonide</td>
<td>MDI</td>
<td>AstraZeneca</td>
</tr>
<tr>
<td>Salmeterol + fluticasone</td>
<td>DPI</td>
<td>GlaxoSmithKline</td>
</tr>
<tr>
<td>Vilanterol + fluticasone</td>
<td>DPI</td>
<td>GlaxoSmithKline</td>
</tr>
<tr>
<td>Formoterol + mometasone*</td>
<td>MDI</td>
<td>Merck</td>
</tr>
</tbody>
</table>

*Off-label use. Not indicated for the treatment of patients with COPD.

MDI, Metered dose inhaler


Lung Function with ICS/LABA Combination Therapy (TORCH Study)

Primary endpoint of mortality not reached in this study.

↓ annual rate of exacerbations from 1.13 to 0.85 (P<.001)

May inhibit fibroblast-mediated contraction and formation of fibrotic tissues, which can disrupt lung function

Roflumilast
- Oral, selective, long-acting inhibitor of an enzyme called PDE4
- Indicated for treatment to reduce the risk of exacerbations in patients with severe COPD associated with chronic bronchitis and a history of exacerbations


### Therapies on the Horizon

<table>
<thead>
<tr>
<th>Type</th>
<th>Agent</th>
<th>Delivery</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAMA</td>
<td>Glycopyrronium bromide</td>
<td>Nebulizer</td>
<td>Sunovion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DPI</td>
<td>Vectura, Sosei/Novartis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MDI</td>
<td>Pearl</td>
</tr>
<tr>
<td>LABA / LAMA</td>
<td>Indacaterol + glycopyrronium bromide</td>
<td>DPI</td>
<td>Vextura, Sosei/Novartis</td>
</tr>
<tr>
<td></td>
<td>Acclidinium + formoterol</td>
<td>DPI</td>
<td>Almirall/Forest</td>
</tr>
</tbody>
</table>
Device Selection

- COPD patient population is diverse with various levels of functioning
- Handheld devices assume patient is able to use correctly

Inspiratory Flow Rates in Patients with COPD

- ~1 of 5 patients with advanced COPD and ≥ 60 years of age exhibited a suboptimal peak inspiratory flow rate (PIFR) against DPI resistance (<60 L/min)\(^1\)
  - 80% were female, had shorter height, and lower FVC and inspiratory capacity (IC)

- A study of DPI vs nebulized LABA in patients with suboptimal PIFR (53 ± 5 L/min) found that improvements in FEV\(_1\), FVC, and IC were significantly higher with arformoterol than with salmeterol at 15 minutes\(^2\)

- Patients with suboptimal PIFR may have difficulty actuating a DPI, which may reduce medication delivery

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Patient/Caregiver Experiences with Nebulized Therapy

- Patients were “Highly satisfied with their current nebulized treatment” (89%) and had “Easier breathing” (68%)

- Patients agreed that nebulization provided “Better control of symptoms” (85%) and “Greater confidence that the right amount of medication was being delivered” (84%)

- Caregivers stated that nebulization “Made it easier to care for their friend/family member” (86%)

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Clinical Scenarios Where Nebulized Therapy May Be Preferred

- Cannot generate adequate inspiratory flow required by DPIs
- Cannot use pMDIs or DPIs appropriately despite adequate education and training
- Debilitated after hospitalization and cannot coordinate breathing with device requirements
- Inadequate symptom relief with appropriate use of pMDIs or DPIs
- Nonadherence with pMDIs or DPIs
- Preference for nebulization
- Cognitive impairment (eg, Alzheimer’s, altered consciousness)
- Impaired manual dexterity (eg, arthritis, Parkinsonism, or stroke)
- Pain or weakness from neuromuscular disease (eg, multiple sclerosis)
- Need for higher bronchodilator or corticosteroid doses to control diseases
- Cannot afford therapy with pMDIs or DPIs

Quality of Life (QOL) Improvements with Nebulized Therapy

- QOL improvements seen more with nebulized therapy compared with DPI
- An effective regimen for improving QOL is the combination of nebulizer in the morning and night, with an inhaler in the afternoon and evening

Discharge & Transitional Care Planning

Case Study #2: 72-year-old Male
Case Study #2: Background

- 72-year-old male
- History
  - Former smoker with 45 pack-year history
  - Current diagnosis of GOLD Group C
  - Arthritis
  - Poor vision
- Current medications
  - Nebulized SABA
  - LAMA DPI (has trouble coordinating breathing with device)
- Presents to ED experiencing an exacerbation for the second time in <3 weeks

Case Study #2: Presentation and Exam

- Productive cough upon taking deep breaths
- Dyspnea: trouble walking across the room
- Chest tightness
- No significant edema
- Physical exam
  - Wheezing and decreased breath sounds
  - Temperature: 100.2
  - HR: 70, regular rate, no murmurs
  - BP: 130/72
- SpO₂: 86%
Case Study #2: Management

- Administered oxygen
- Administered SABA/SAMA combination
- Admitted to the hospital following reassessment
- Prescribed oral corticosteroids and antibiotics
- Initiated on a nebulized LABA therapy to be continued in home setting
- No family present

Follow up and Other Key Items to Consider at Discharge

**Items**

- Schedule follow-up visit within 1 week (preferably within 72 hours)
- Maintenance treatment and importance of adherence
- Technique instruction
- Assess home care
- Assess need for oxygen and/or home nebulizer
- Smoking cessation
- Vaccinations
- Pulmonary rehabilitation
- Provide plan for comorbidities

An outpatient visit during the month after admission for an exacerbation resulted in fewer ED visits (14%) and 30-day readmissions (9%)\(^1\)

- 30-day readmission was 10 times more likely for patients not attending a primary care follow-up within 4 weeks of discharge\(^2\)

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At discharge:
- 55% of patients not prescribed maintenance bronchodilators
- 23% of patients not prescribed an inhaled therapy
Additional Strategies to Prevent Hospital Readmissions

COPD Patient Care Pathway: Identifying Additional Strategies

Consider 72-hour postdischarge follow-up call

Post-discharge Setting

Collaborative Care Team: 1- to 2-week post-discharge follow-up

Transition Management

Patient Education/Counseling
- Cultural competency
- Health literacy

Home Care
- Update referral tracking and care information
- Communicate with specific providers
- Assess for barriers to care and refer to community/social services/other HCPs, if needed
- Provide patient education/counseling
- Refer to pulmonary rehab, if applicable

Pharmacy
Medication reconciliation

Medication Management
- Assess patient tolerability
- Assess patient response to medications
- Assess for medication nonadherence
- Reconcile any new medications

Reassess with spirometry if patient shows improvement

Evaluate patient health literacy

Consider including therapy known to reduce exacerbation risk (long-acting inhaled bronchodilators, with or without inhaled steroids, and possible PDE4 inhibitors)

HCP, healthcare provider. Slide courtesy of: Stanley B. Fiel, MD.
Outpatient providers must provide 3 key services:

- Make contact with patients within 2 days of discharge
- Have a face-to-face visit with moderate-complexity or high-complexity patients within 7-14 days of discharge
  - CPT Code 99495 – Transitional care management services with moderate medical decision complexity (face-to-face visit within 14 days of discharge)
  - CPT Code 99496 – Transitional care management services with high medical decision complexity (face-to-face visit within 7 days of discharge)
- Provide care coordination services within 30 days of discharge

Provides financial incentive to assess patients 1 to 2 weeks following discharge

Changes in Post discharge Care Policy (2013)

Identify patients at high risk for rehospitalization and target specific interventions to mitigate potential adverse events

- Reduce 30-day readmission rates
- Improve patient satisfaction scores and HCAHPS scores related to discharge
- Improve flow of information between hospital and outpatient physicians and providers
- Improve communication between providers and patients
- Optimize discharge processes

SHM’s Project BOOST: Goals
Pulmonary Rehabilitation:
Program Essentials

Smoking Cessation
- Considered to be the most important therapeutic intervention in patients with COPD
- Has been shown to reduce COPD risk and mitigate the decline in pulmonary function
- Brief clinical interventions are clinically effective and cost effective
- Smoking cessation aids
  - Nicotine replacement gum, patch, inhaler
  - Bupropion
  - Varenicline


Pulmonary Rehabilitation:
Program Essentials (cont’d)

- Exercise training
- Nutrition counseling
- Education

Pulmonary Rehabilitation Reduces COPD Exacerbation Frequency


Vaccinations to Prevent Future COPD Exacerbations

- **Influenza vaccines**
  - ↓ respiratory tract infections that result in hospitalization and death in patients with COPD

- **Pneumococcal vaccines**
  - ↓ rate of community-acquired pneumonia in COPD patients
  - Pneumococcal infections result in a significant percentage of acute exacerbations of COPD

- **Vaccinations remain highly underused**
  - 38.4% of patients with COPD admitted to a university medical center had a prior influenza vaccine
  - Only half of eligible patients presenting with an exacerbation to a set of urban hospitals had influenza and pneumococcal vaccines

Exacerbations of COPD impose a significant health and economic burden in the hospital setting.

Appropriate inpatient management should include confirmation of diagnosis by objective measures and risk assessment.

Individual patient characteristics, in particular comorbid conditions, influence the potential for readmission and should be addressed at the point of care.

Maintenance therapy matters and should be taken into account as part of the inpatient treatment and discharge plans.

Provision for individualized discharge and transitional care plans may help prevent hospital readmissions.

Summary

**Additional Resources**

- SHM Project BOOST
  - www.hospitalmedicine.org/boost
- Project RED (Re-Engineered Discharge)
  - www.bu.edu/fammed/projectred/
- COPD Foundation
  - www.copdfoundation.org