COPD in Transitions of Care – an opportunity for Pharmacists

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Objectives and Agenda

• Recognize the burden of disease in older adults
• Acknowledge Burden on our Health Care System
• Describe the pharmacology of treatments and their impact on the disease process
• Demonstrate the varied administration methods for treatments and the importance in post acute care
• Recognize the new Treatment Guidelines for COPD
• Define the role of the pharmacist

What is COPD?

• The Global Initiative for Obstructive Lung Disease (GOLD) defines COPD as:
  • A disease state characterized by airflow limitation that is not fully reversible.
  • The airflow limitation is usually both progressive and associated with abnormal inflammatory response of the lungs to noxious particles or gasses.
COPD Has Been Shown to Be a Common and Costly Condition

- COPD is the 3rd leading cause of death in the United States1,2
- COPD is the 2nd leading cause of disability3
- By 2010, there were 14.8 million diagnosed COPD patients in the US4
- COPD accounts for an estimated $29.5 billion in direct healthcare expenses5


Mortality of COPD Is Increasing

- COPD is the only leading cause of death that is increasing.

Adapted with permission from Higgins MW, Thom T. In: Clinical Epidemiology of COPD. 1990:23-43.

COPD in Long Term Care

- One of every six admissions to nursing homes was for patients with a history of emphysema or COPD1
- In the last 12 months of COPD patients' lives, one recent study reported there was a 40% likelihood of being admitted to a LTC facility2
- Approximately 22% of the respiratory-related healthcare costs are nursing home costs; a greater amount was spent on hospitalizations (approximately 50%)
COPD in Long Term Care

- The majority of persons with COPD have cardiovascular disease including coronary artery disease, heart failure, and hypertension.
- Stroke occurs in a significant portion of persons with COPD.
- About 25% of persons with COPD have concurrent asthma.
- Age-related and steroid-induced osteoporosis occur frequently in persons with the disease, and COPD is a risk factor for nursing home-associated pneumonia.
- A significant number of persons with COPD have obstructive sleep apnea.

- Depression and anxiety are also common in COPD; one study found that 40% of persons with COPD have depressive symptoms.
- Diabetes mellitus occurs in about 25% of persons with COPD.
- Malnutrition is a significant issue in some individuals with COPD.
- Substantial chronic airway obstruction leads to greater energy requirements due to the increased work of breathing, as well as inactivity from deconditioning.

Economic Burden of COPD

- Annual cost in the US: $30.4 billion
  - Direct cost: $14.7 billion
  - Indirect cost: $15.7 billion
  - Emergency services, hospitalization
  - Per capita Medicare expenditure nearly 2.5 times higher with a COPD diagnosis than without
    - $8,482 vs. $3,511 without COPD
  - Diagnosis of chronic respiratory disease is associated with a 172% increase in mean health care costs

Correlation Between Disease Severity and Total Treatment Cost

- Retrospective pharmacoeconomic analysis
  - 413 patients, 5 years
- Stage 1 (Mild) COPD: $1,681/patient/year
- Stage 2 (Moderate) COPD: $5,037/patient/year
- Stage 3 (Severe) COPD: $10,812/patient/year

Stepwise Approach to Treatment

- Early and accurate diagnosis
- Prevention of disease progression (deterioration of pulmonary function)
- Relief of symptoms
- Improvement in exercise tolerance and health status
- Prevention and treatment of exacerbations and complications
- Improvement in quality of life
- Reduction in mortality.

Includes drug therapy, smoking cessation, oxygen, pulmonary rehabilitation, and nutritional intervention.

GOLD GUIDELINES

Spirometry, symptoms, and exacerbation history provide a more complete assessment and picture of disease status.
Maintenance Therapy for Long-term COPD Care–Considerations

• Focus of COPD care is shifting from acute treatment to long-term maintenance1,2
• Many patients did not receive any maintenance COPD therapy4
• GOLD can be used to inform the prescribing of maintenance therapy3,5
• When selecting an inhaled COPD therapy, drug delivery and training should be considered6


Maintenance Therapy for Long-term COPD Care–Considerations

• In the hospital prior to discharge, patients should start long-acting bronchodilators, either beta-agonists and/or anticholinergics with or without inhaled corticosteroids3
• Add 1 or more classes of long-acting bronchodilators when needed1


Risk Factors for COPD

• Smoking is the predominant risk factor1,2
• Implicated in >90% of US patients with COPD
• Others include1:
  • Air pollution
  • Poor nutrition
  • Childhood respiratory infections
  • Preexisting bronchial hyperreactivity
  • α1-Antitrypsin deficiency (genetic, rare)
  • Occupational and environmental exposure (eg, coal dust, silica)

Risk Factors for COPD


Age-Related Decline in FEV$_1$ Is Accelerated in Smokers

Adapted with permission from Fletcher C, Peto R. BMJ. 1977;1:1645-1648.

Healthy patient

Patient with obstructive lung disease

FEV$_1$ = forced expiratory volume in 1 second
FVC = forced vital capacity
Mechanisms of Airflow Limitation in COPD

Pharmacotherapy: Anticholinergic Agents

- Block bronchoconstriction
- Increase FEV1
- Have been shown to reduce exacerbation rate
- May be associated with lower treatment costs
- Anti-cholinergics are considered first line
- Minimal side effects
- Do not cross blood-brain barrier
- Minimal gastrointestinal absorption
- Extended therapy associated with improved baseline pulmonary function


Cholinergic Tone

- Acetylcholine Resistance = 1/tradius
Long-Acting β₂-Adrenergic Agonists

- Effective in improving FEV₁ and FVC, and may reduce COPD exacerbations
- May provide relief from nocturnal symptoms
- Can be used with ipratropium if short-acting β₂-agonist used frequently for rescue
- Unlike short-acting β₂-agonists, **NOT** for rescue


Inhaled Corticosteroids

- If response to anticholinergic and other bronchodilator therapy is suboptimal, inhaled corticosteroid therapy may provide benefit in some patients
  - Indicated only in patients
    - who are already receiving chronic low-dose corticosteroid therapy, or
    - who have a documented objective response to corticosteroid therapy


- 4 major studies have been conducted
  - No effect on mortality, rate of decline of FEV₁
  - No significant increase in FEV₁ short term

Short-Acting β₂-Adrenergic Agonists

- If response to initial anticholinergic therapy suboptimal, add β₂-adrenergic agonist
- Combination MDI (ipratropium and albuterol)
  - Greater efficacy, equivalent safety
  - Lower rate of exacerbations
  - Lower total treatment costs
  - Improved cost-effectiveness

MDI, metered-dose inhaler

Theophylline

- If response to initial anticholinergic/β₂-agonist therapy suboptimal, consider adding theophylline
- Long-acting formulations generally preferred
- Modest bronchodilation, mild anti-inflammatory effects
- Useful for noncompliant patients and those who have trouble with inhalation aerosols and those preferring oral drugs
- Titrate dose to serum level up to a maximum of 12 µg/mL
- Some patients experience side effects at lower serum levels

Anti-Inflammatory Agents

- If bronchodilator response is suboptimal, consider adding an anti-inflammatory drug
  - Corticosteroids (oral/inhaled)
- Useful in few patients
  - Consider 2-week trial of oral corticosteroid (40 mg prednisone QD)
  - Discontinue if no response
  - If patient responds, taper to minimal effective dose level and switch to inhaled corticosteroid
Anti-Inflammatory Agents

- Limited role in chronic COPD
  - 10% improve FEV1, 20%2
  - May actually detect “hidden” asthma3,4
- Cromolyn, nedocromil, and leukotriene modifiers have not been proven effective in COPD1


Long-Term Oxygen Therapy

- Indicated for PaO2 <55 mm Hg or SaO2 <88%1
- Improves1-4:
  - Survival in hypoxemic patients
  - Cognitive function, affect
  - Exercise performance
  - Sleep quality
  - Activities of daily living


Administration

- MDI (Metered Dose Inhaler) vs. HHN (Hand Held Nebulizer)
  - A HHN is not superior to an MDI
  - The problem is technique (consider a spacer)
  - With optimal technique a MDI delivers close to 12% of the drug to the lung.
  - In general, the HHN dose needs to be 6 to 10 times higher than the MDI to deliver the same degree of bronchodilation.
- Consider nursing administration time
- Consider the patient
Post Acute and Long Term Care

• What does all of this mean to us?
• A New Focus on management and an effort to reduce hospitalizations
  • Impact to SNF
  • Impact on therapeutic decisions
• Assessing devices and matching them to patients
• COST EFFECTIVENESS

Post Acute and Long Term Care

• Formulary development
• Assessment surveys or work ups
• Cost management
  • Working with industry
    • Education
    • Discounts to Nursing Homes?
    • Product placement

Post Acute and Long Term Care

• Today:
  • Hospitals work to discharge
    • May or may not reconcile the medication list when sent to the nursing home
    • Goal is to maximize pulse ox and limit resources
    • (related to payment mechanisms)
  • LTC – day 1 – clean up the profile on admission, limit cost
Post Acute and Long Term Care

• Tomorrow:
  • Hospitals work to discharge
  • Better data and reconciliation
  • Recognition of penalties for re-hospitalizations
  • May add resources for medication counseling

• LTC:
  • Day 1 – clean up the profile on admission
  • Plan of Care for discharge
  • Reconciliation and Counseling critical
  • On the hook for re-hospitalizations

Questions