COPD: Barriers to Effective Management
Learning Objectives for COPD: Barriers to Effective Management

- Describe common problems in the management of COPD patients and cite possible office systems solutions.
- Describe clinical challenges in the management of difficult COPD patients and cite possible solutions the referral specialist can offer.
Accreditation Statement

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Target Audience
Primary care physicians, nurse practitioners, and physician assistants

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Dr. Niewoehner plans to discuss off-label/investigational uses of formoterol, salmeterol, tiotropium, or theophylline for managing exacerbations of COPD.
COPD Performance Improvement Initiative: Chart Reviews

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Participants in the Program

- 205 people registered
- 142 people started the program
- 74 people started their initial chart review
- 20 people completed their initial chart review
- 19 people submitted their action plans and are awaiting their follow-up chart review
Performance Improvement

• Enrolling in this PI program is the 1st step in improving care for your patients

• Key component to improvement is chart review
  • Simple way to look at baseline measures of your practice
  • Very act of reviewing charts can be illuminating
Chart Review Challenge

• Biggest Challenge = Time

• Ways to overcome this barrier:
  • Ask support staff to review patients seen in the past month with any ICD 9 code for COPD and pull charts or review EMR
  • Complete the chart review with another member of your team
  • Make a plan to complete this chart review
    • Schedule 2 one-hour sessions over the next week using administrative time or your lunch hour
COPD Project

• Make a commitment to yourself and your patients to work toward improving care!

• Complete the chart review as soon as possible as your first step toward improvement

• If you are having trouble completing the chart reviews, please let us know. We can help!

• If you have any questions, please email us at mentorqi@bu.edu or call us at 617.638.4605
Barriers to the Management of COPD: A Practical Office-Based Approach

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Case Study: Patient Presentation

- Mr. T is a 68-year-old man with a history of COPD who presents to his physician’s office with worsening of his exertional dyspnea.
- The symptoms have occurred over several days, accompanied by cough and purulent sputum production.
Case Study: Patient History

- Mr. T has missed several appointments and has not visited the office for more than a year. He has been hospitalized once and had 2 ED visits since his last office visit.

- Medications
  - Uses a short-acting beta$_2$ agonist as needed
  - Does not use the previously prescribed inhaled tiotropium

ED = emergency department.
Case Study: Patient History (cont’d)

- Social history
  - Smokes 1 pack of cigarettes daily
  - No excess alcohol intake
- Review of symptoms
  - Fatigue
  - Loss of interest in activities
  - Prefers to remain at home alone rather than participate in social activities
Case Study: Chart Review

- Despite the diagnosis of COPD, there is no record of spirometry
- No documentation of education/pulmonary rehabilitation for pulmonary disease
- No documentation of influenza or pneumococcal vaccinations
- No pulse oximetry or arterial blood gases (ABGs)
Case Study: Physical Examination

- Temp 98.7° F; pulse 72/min; resp 16/min; BP 124/70
- Mild dyspnea at rest
- Cardiovascular: no evidence of congestive heart failure
- Pulmonary: prolonged expiratory phase of respiration; scattered expiratory wheezes; decreased breath sounds

BP = blood pressure.
Case Study: Laboratory Findings

- Pulse oximetry: 92%
- Chest X-ray: findings of COPD with no congestive heart failure or pulmonary infiltrates
- White blood cell count: normal with a normal differential
Case Study: Treatment

• Acute
  – Provide appropriate treatment for an acute exacerbation of COPD

• Chronic
  – Explore reasons for possible noncompliance and lack of adequate long-term management for COPD
Chronic Disease Management

- **Problem:**
  - Missed appointments
  - Hospitalizations; ED or urgent-care visits

- **Possible solutions:**
  - Use office system to identify missed appointments
    - Promote support staff awareness of the importance of follow-up
  - Use system approach for notification of hospitalizations; ED or urgent-care visits
  - Provide initial education emphasizing the importance of regular medical follow-up for chronic disease management
Chronic Disease Management (cont’d)

- **Problem:**
  - Noncompliance with long-acting bronchodilator
    - Mr. T did not have any immediate effect from the inhalation of tiotropium

- **Possible solutions**
  - Provide initial education regarding the expectations of treatment with tiotropium or any prescribed medication
  - Ask questions regarding possible economic issues
  - Ask questions regarding possible side effects
  - Review all prescribed medications and attempt to simplify regimens
Chronic Disease Management (cont’d)

- Problem:
  - Continued tobacco abuse

- Possible solutions
  - Provide additional education regarding smoking cessation
  - Review therapeutic options
    - Pharmacologic
  - Provide referral for smoking cessation program
  - Use system solution for tobacco cessation education
    - Office education programs
Smoking Cessation Options

- Individual, group, and telephone counseling
  - 2 components enhance effectiveness of counseling
  - Practical counseling (problem solving/skills training)
  - Social support (as part of treatment)
- First-line medications (except when medically contraindicated)
  - Bupropion SR
  - Nicotine gum
  - Nicotine inhaler
  - Nicotine lozenge
  - Nicotine nasal spray
  - Nicotine patch
  - Varenicline

Chronic Disease Management

• Problem:
  – Depression
    ▪ Possible cause of noncompliance
    ▪ Possible cause of unwillingness to leave home for appointments

• Possible solutions:
  – Screen all patients with chronic disease for depression
  – Provide appropriate treatment or referral
  – Maintain high level of suspicion for the diagnosis of depression
Depression Common in Patients With COPD

• Of 1,736 participants with COPD, 40% had ≥3 depressive symptoms. Depressive symptoms were more common in COPD than in coronary heart disease, stroke, diabetes, arthritis, hypertension, and cancer¹

• Patients with frequent exacerbations are more depressed than those with infrequent exacerbations²

Chronic Disease Management

- Problem:
  - Spirometry not performed

- Possible solutions
  - Provide spirometry in the office
  - Promote increased provider awareness of guidelines for the management of COPD
    - Obtain necessary information to stratify the severity of COPD and offer appropriate therapy
  - Use flowsheet for chronic disease management
    - Facilitates data management
Treatment of COPD According to Spirometric Stage of Disease

I: Mild
- FEV₁/FVC <0.70
- FEV₁ ≥80% predicted

Add regular treatment with one or more long-acting bronchodilators (when needed).
Add rehabilitation.

II: Moderate
- FEV₁/FVC <0.70
- 50% ≤FEV₁ <80% predicted

Active reduction of risk factor(s); influenza vaccination.
Add short-acting bronchodilator (when needed).

Add inhaled glucocorticosteroids if repeated exacerbations.

III: Severe
- FEV₁/FVC <0.70
- 30% ≤FEV₁ <50% predicted

Add long-term oxygen if chronic respiratory failure.
Consider surgical treatments.

IV: Very Severe
- FEV₁/FVC <0.70
- FEV₁ <30% predicted plus chronic respiratory failure

COPD = chronic obstructive pulmonary disease; FEV₁ = forced expiratory volume (in liters) in 1 second; FVC = forced vital capacity.
Chronic Disease Management

• **Problem:**
  - Lack of vaccinations
  - Lack of pulse oximetry or ABGs

• **Possible solutions:**
  - Use system approach for vaccinations of all patients with chronic illness
    - Quality indicator for chart audits
    - Vaccination record or flowsheet
  - Provide pulse oximetry in the office
    - Nocturnal pulse oximetry
    - Determine the need for home O₂
Mortality Benefit of Continuous $O_2$ in Patients With Resting Hypoxia

- Taken together, the MRC trial$^1$ and NOTT$^2$ demonstrated a relationship between survival and the average daily duration of oxygen use$^3$ in patients with a clinical diagnosis of severe COPD and severe resting arterial hypoxemia.

- Median survival in patients using oxygen for 18 h per day was approximately twice as long as those receiving no oxygen.

MRC = Medical Research Council; NOTT = Nocturnal Oxygen Treatment Trial.
Chronic Disease Management

• Problem:
  – Lack of patient education or pulmonary rehabilitation

• Possible solutions:
  – Provide in-office education
    ▪ Nurse practitioner/PA
  – Provide referral for pulmonary rehabilitation
  – Use flowsheet to track appropriate referrals
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Overcoming Barriers to the Management of COPD: Summary

- Implement a systems approach to chronic disease management
- Promote awareness of guidelines
- Provide education of office support staff
- Institute a means of recording and tracking appropriate data
Clinical Questions on Managing the Difficult COPD Patient: What the Referral Specialist Can Offer

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Overview

- Case Study: The Challenging COPD Patient
- Use of combination inhalers
- Use of theophylline by specialists
- Ambulatory oxygen: uses and misperceptions
- Unproven or not recommended drug therapies for COPD
- Self-management/Disease management: the importance of patient education
- Surgical options
The Challenging COPD Patient: Case Description

- A 68-year-old man was referred by his primary care provider with a request for assistance in COPD management.
- Dyspnea, which had first occurred about 10 years before, had progressed to the point where he could walk only about 100 feet without stopping.
- He had had 3 exacerbations in the past year that required hospitalization or an ED visit.
- He had smoked heavily for 50 years but had stopped 2 years previously.
The Challenging COPD Patient: Case Description (cont’d)

- Regular medications included an inhaled long-acting beta-agonist, an inhaled corticosteroid, and a short-acting beta-agonist
- He was current with recommended immunizations
- Most recent spirometry showed an FEV₁ of 0.65 L, an FVC of 1.93 L, and an FEV₁/FVC of 0.34
- Oxygen saturation was 92% when sitting at rest while breathing room air but it dropped to 85% after walking up and down the hallway
- Chest X-ray demonstrated hyperinflation and emphysema
- Comorbidities included hypertension, peripheral vascular disease, and diabetes mellitus
The Challenging COPD Patient: Some Considerations

- Confirm diagnosis of COPD
- Exclude comorbidities as cause of worsening dyspnea
- Additional pharmacologic interventions
  - Combinations of inhaled steroids and long-acting bronchodilators
  - Theophylline
  - Oxygen
- Nonpharmacologic interventions
  - Disease management
  - Surgical options
Combined ICS and LABA: TORCH

Exacerbations/Patient-Year

Combination Inhalers: OPTIMA Trial

Theophylline: Therapeutic Index

Jenne JW. Chest. 1989; 92(1 Suppl):7S-14S.
Effect of Theophylline on COPD Exacerbations

% Patients With ≥1 Level 2 Exacerbations

Placebo: n = 220
Formoterol 12 µg: n = 211
Formoterol 24 µg: n = 214
Theophylline: n = 209

P = .02
P = .04

Prescribing of Theophylline for COPD

- Aim for blood level of 8-12 µg/mL
- Start with 300-400 mg daily in older men and 200-300 mg daily in older women
- Much individual variation in pharmacokinetics
- Numerous drug-drug interactions
- Check blood level in 7-10 days
- Theophylline metabolism is first order; in given individual, average blood level is proportional to daily dose
- Recheck blood level annually and more frequently if there is change in clinical condition
Ambulatory Oxygen: Uses and Misperceptions

- Proven mortality benefit in COPD patients with persistent hypoxemia who are in a stable clinical state (eg, O₂ sat ≤88% or pO₂ ≤55 mm Hg)*
- Ambulatory oxygen is commonly prescribed for patients who desaturate only with exercise, as is the case with outpatients. Medicare and most insurance plans allow this indication.

Ambulatory Oxygen: Uses and Misperceptions (cont’d)

• Clinical benefit for this indication remains unproven. Dyspnea severity correlates very poorly with exercise desaturation.

• Ambulatory oxygen may be offered to such patients as a therapeutic trial, but discontinue if no symptomatic benefit.

• Many patients do not wish to use oxygen because of nuisance factors and social stigma.
Unproven or Not Recommended Drug Therapies in COPD

- Leukotriene antagonists
  - Montelukast
  - Zafirlukast
  - Zileuton
- Levalbuterol
- N-acetylcysteine
- Chronic prednisone
Erythromycin Prophylaxis to Prevent COPD Exacerbations

Exacerbations in 1 Year

- Placebo: N = 56
- Erythromycin: N = 53

\[ P = .004 \]

MACRO Trial Study Design

- Randomized, double-blind, placebo-controlled
  Active arm: azithromycin, 250 mg qd
- Duration: 1 year
- “High-risk” patients
- Powered to show 20% relative reduction (1,130 patients) in COPD exacerbations
- Close monitoring of bacterial resistance patterns

Quebec Self-Management Trial: The Importance of Patient Education

- Patient education program (8 weeks)
  - Basic information about COPD
  - Medicine compliance, immunizations
  - Breathing techniques
  - Action plan
  - Healthy lifestyle
  - Leisure activities
  - Home exercise
  - Oxygen therapy (if appropriate)
- Monthly reinforcing phone calls
- Ready availability of case manager

Quebec Self-Management Trial: Prevention of COPD Hospitalizations

% Subjects With ≥1 COPD Hospitalizations

Usual Care: n = 95  Intervention: n = 96

P < .01

1- to 1.5-hour group education session
- General information about COPD
- Proper inhaler techniques
- Optimization of chronic COPD medications
- Smoking cessation, if needed
- Vaccinations
- Evaluation for long-term home oxygen
- Encourage regular exercise
- Exacerbation education

Written action plan with refillable antibiotic and prednisone Rx
Availability of case manager (respiratory therapist) for questions with regularly scheduled phone calls at 4-week intervals

VISN = Veterans integrated Service Network.
**COPD ED visits or hosp admits**

(Events/100 pt-yrs)

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<th>Usual care</th>
<th>Intervention</th>
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| **COPD Hosp admits**
(Events/100 pt-yrs) |            |              | P < .01 |
| **COPD ED visits**
(Events/100 pt-yrs) |            |              | P < .0001 |

Bronchitis and Emphysema Advice and Training to Reduce Hospitalization (BREATH)

• Randomized, 2-arm trial (VA Cooperative trial)
  ▪ Usual care
  ▪ Comprehensive case management
• Duration: 1 year
• “High-risk” patients (COPD hospitalization in past year)
• Primary outcome: time to first COPD hospitalization
• Powered to show 8% absolute reduction from 35% to 27%
  (960 patients)

Common Surgical Options

- Lung transplantation
- Lung volume reduction surgery

Survival After Lung Transplantation

Severe Emphysema: Upper Lobe Dominance

Poor upper lung perfusion

Lung Perfusion

Courtesy of Dr. Dennis Niewoehner.
Lung Volume Reduction Surgery: NETT - Survival Data

NETT = National Emphysema Treatment Trial.
Discussion/Questions