COPD: Diagnosis, Management & Education

The Numbers
- 15 million patients in the U.S.
- 1.5 million emergency department visits annually
- 150 million days of lost work annually
- $32.1 billion annually in medical costs
- 114,000 deaths annually in the U.S.

Incidence and Prevalence
- The incidence of COPD is underestimated because it is not usually recognized and diagnosed until it is clinically apparent and moderately advanced
- Prevalence, morbidity, and mortality vary appreciably across countries but in all countries where data are available, COPD ranks high among health problems in both men and women

Future Mortality Worldwide

Diagnosis of COPD
Diagnosis

- COPD is easy to diagnose, but only if physicians have a high degree of suspicion
- Many physicians do not think of or look for COPD
- For that reason, the prevalence is probably grossly underestimated

Diagnosis

- Many patients fail to bring breathing problems to the attention of their physicians
- Patients, often unconsciously, modify their behavior to avoid shortness of breath
- Our “built environment” makes it easy to avoid symptoms

"We can’t wait for patients to come into our offices and complain of symptoms. Many patients with COPD slowly modify their lifestyle over the years to do less demanding activities that do not lead to shortness of breath.

Instead, we need to ask them probing questions to identify what their activities were years ago and determine whether their activity is less than that of their peers. Only then
will we reach them when they still have subclinical disease in their minds.

We certainly can’t wait until they have a chest x-ray that is grossly abnormal showing hyperinflation and pulmonary hypertension—this is much too late.

The intensive care unit is the worst place to initially diagnose COPD — it needs to be done much earlier in the offices of primary care clinicians at a time when mild or moderate disease can be identified."

Diagnosis

- For the diagnosis and assessment of COPD, spirometry is the gold standard
- Screening everyone is obviously not a cost- or time-efficient solution and the high number of negative results can lead to disillusionment about the usefulness of spirometry
- Who should have spirometry?

Diagnosis

- Is spirometry being used?
  - 32% of primary care physicians use spirometry
  - 79% of pulmonologists use spirometry
- Why are these numbers so low? Why not 100%?
Diagnosis

- Reimbursement is the biggest obstacle to widespread use of spirometry
- Hopefully, as patients begin to request to “Know Their Numbers” (lung age, FEV1, FEV1/FVC ratio) more providers will begin to perform spirometry in those at risk for COPD more often
- This would provide the evidence-based data on the effectiveness of earlier detection of COPD and maybe push insurers toward better reimbursement

Diagnosis

- Many physicians maintain outdated views of spirometry
  - equipment is unwieldy
  - results are difficult to interpret
  - treatment decisions can be made just as easily on the basis of symptoms and a physical exam

Diagnosis

- Generally, physicians will only use spirometry if they believe a diagnosis will lead to a benefit
  - We know that for patients with moderate or severe COPD, there is a proven benefit to diagnosis:
    
    **It leads to treatment!**

Diagnosis

Byron Thomashow, M.D.
Clinical Professor of Medicine at Columbia University

"Medical schools fail to teach spirometry. During residency, a pulmonary rotation is generally an elective, not a requirement. Even then, it's more about learning ventilators and helping the really, really sick people."

Management

- How does COPD progress?
  - Gaps in our knowledge prevent a concrete answer
  - We know that continued exposure to particles and gases that cause COPD accelerates its course
  - We know the course is punctuated by periodic exacerbations, most often caused by viral or bacterial infections of the bronchial airways
Management

- How does COPD progress?
  - These account for great morbidity and cost, and occur more frequently in patients with severe COPD
  - Recovery from exacerbations of COPD may be prolonged, but their impact on the overall rate of loss of pulmonary function is unknown

Components of Management

- According to GOLD (Global Initiative for Chronic Obstructive Lung Disease), there are four components to the management of COPD

Objectives of Management

- Prevent disease progression
- Relieve symptoms
- Improve exercise tolerance
- Improve health status
- Prevent and treat exacerbations
- Prevent and treat complications
- Reduce mortality
- Minimize side effects from treatment
Factors in COPD Severity

- Severity of symptoms
- Severity of airflow limitation
- Frequency and severity of exacerbations
- Presence of complications of COPD
- Presence of respiratory insufficiency
- Comorbidity
- General health status
- Number of medications needed to manage the disease

Classification of Severity

| Stage | Characteristics                          
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>0</td>
<td>At risk, normal spirometry, chronic symptoms (cough, sputum)</td>
</tr>
<tr>
<td>I</td>
<td>Mild, FEV₁/FVC &lt; 70%, FEV₁ &lt; 60% predicted, with or without chronic symptoms (cough, sputum)</td>
</tr>
<tr>
<td>II</td>
<td>Moderate, FEV₁/FVC &lt; 50%, FEV₁ &lt; 50% predicted, with or without chronic symptoms (cough, sputum, dyspnea)</td>
</tr>
<tr>
<td>III</td>
<td>Severe, FEV₁/FVC &lt; 30%, FEV₁ &lt; 30% predicted, with or without chronic symptoms (cough, sputum, dyspnea)</td>
</tr>
<tr>
<td>IV</td>
<td>Very Severe, FEV₁/FVC &lt; 20%, FEV₁ &lt; 20% predicted or FEV₁ &lt; 20% predicted plus chronic respiratory failure</td>
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Assess and Monitor

- History of risk factors and the presence of airflow limitation that is not fully reversible, with or without the presence of symptoms
- Patients who have chronic cough and sputum production with a history of exposure to risk factors should be tested for airflow limitation, even if they do not have dyspnea

Assess and Monitor

- Spirometry is the gold standard
- Arterial blood gases should be considered in all patients with FEV₁ < 40% predicted or clinical signs suggestive of respiratory failure or right heart failure

Components of Management

1. Assess and monitor disease
2. Reduce risk factors
3. Manage stable COPD
   - Education
   - Pharmacologic
   - Non-pharmacologic
4. Manage exacerbations

Reduce Risk Factors

- To help prevent the onset and progression of COPD, reduce total personal exposure to
  - tobacco smoke
  - occupational dusts and chemicals
  - indoor and outdoor air pollutants

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Reduce Risk Factors

- Progression of many occupationally-induced respiratory disorders can be reduced or controlled through a variety of strategies aimed at reducing the burden of inhaled particles and gases.
- Smoking cessation is the single most effective and cost-effective intervention to reduce the risk of developing COPD and stop its progression.

Smoking Cessation

What works?

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Increase in cessation rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief Physician Contact</td>
<td>2-3%</td>
</tr>
<tr>
<td>Group meetings</td>
<td>3-10%</td>
</tr>
<tr>
<td>Nicotine gum/lozenges</td>
<td>7-8%</td>
</tr>
<tr>
<td>Bupropion (300 mg/day)</td>
<td>10-13%</td>
</tr>
<tr>
<td>Nicotine nasal spray</td>
<td>12-17%</td>
</tr>
<tr>
<td>Varenicline</td>
<td>15-20%</td>
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Smoking Cessation

- ASK: Systematically identify all tobacco users at every visit
- ADVISE: Strongly urge all tobacco users to quit
- ASSESS: Determine willingness to quit
- ASSIST: Aid the patient in quitting
- ARRANGE: Schedule follow-up contact

Components of Management

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Education

- For patients with COPD, health education can play a role in improving skills, ability to cope with illness, and health status
  - effective in accomplishing certain goals, including smoking cessation

Pharmacologic Therapy

<table>
<thead>
<tr>
<th>0: At Risk</th>
<th>I: Mild</th>
<th>II: Moderate</th>
<th>III: Severe</th>
<th>IV: Very Severe</th>
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<tbody>
<tr>
<td>Avoidance of risk factor(s); influenza vaccinations</td>
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<tr>
<td>Add short-acting bronchodilator when needed</td>
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<tr>
<td>Add regular treatment with one or more long-acting bronchodilators; add rehabilitation</td>
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<tr>
<td>Add inhaled glucocorticosteroids if repeated exacerbations</td>
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<tr>
<td>Add long-term oxygen if chronic respiratory failure</td>
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Non-Pharmacologic Treatment

• Pulmonary rehabilitation – what it can and cannot do
  – Can reduce symptoms of dyspnea and fatigue
  – Can help alleviate anxiety and depression
  – Can reduce hospitalization rates
  – Can improve exercise performance
  – Can enhance overall quality of life
  – Cannot significantly improve pulmonary function

Components of Management

1. Assess and monitor disease
2. Reduce risk factors
3. Manage stable COPD
   • Education
   • Pharmacologic
   • Non-pharmacologic
4. Manage exacerbations

Manage Exacerbations

• Exacerbations of respiratory symptoms requiring medical intervention are important clinical events in COPD

• The most common causes of an exacerbation are infection of the tracheobronchial tree and air pollution, but the cause of about one-third of severe exacerbations is not known

Manage Exacerbations

• Inhaled bronchodilators (beta₂-agonists and/or anticholinergics), theophylline, glucocorticosteroids are effective for the treatment of COPD exacerbations

• Patients experiencing COPD exacerbations with clinical signs of airway infection (e.g., increased volume and change of color of sputum, and/or fever) may benefit from antibiotic treatment

Manage Exacerbations

• Noninvasive intermittent positive pressure ventilation (NIPPV) in exacerbations
  • Improves blood gases and pH
  • Reduces in-hospital mortality
  • Decreases the need for invasive mechanical ventilation and intubation
  • Decreases the length of hospital stay

Management

• Problems with management

• The Confronting COPD Survey interviewed 3,265 people with COPD and found that:
  • 60 percent reported limitations in physical activities
  • 45 percent reported limitations in social activities
  • 36 percent of those under age 65 were unable to work
  • 13 percent had been hospitalized in the past year
Management

• The survey also found that patients consistently underestimated the severity of their disease

• For instance, of those whose symptoms were so severe they had trouble leaving the house, 36 percent said they had “mild or moderate” disease

Education

• Probably the least utilized component and one where our success is woefully inadequate

• Two examples:
  • Although cigarette smokers are at high risk for COPD, few recognize it as a threat - the vast majority do not realize that they are nearly as likely to die from COPD as from lung cancer
  • Approximately 70 percent of smokers are ready to quit, but they need to know how

Education

• Two surveys, Confronting COPD and the COPD Resource Network Needs Assessment Survey, show that patients do not feel well informed about treatment options
  • Many never or rarely see lung specialists
  • Awareness of pulmonary rehabilitation and its benefits is low, and dissatisfaction with treatment is high

Education

• The lack of awareness of pulmonary rehabilitation, in particular, is deplorable
  – One doctor told a patient that “he wasn’t sick enough” for it
  – Another patient was told he was “too sick”
  – One man received an erectile dysfunction medication and a short-acting bronchodilator, and that was it

Education

• But we have proof that educating patients about their disease can have very positive results
Education

• In Quebec, seven hospitals recently completed a prospective, randomized trial of 191 COPD patients older than 50 with stable disease
  • Half of the patients received usual care, and the other half received education in self-management of the disease
  • The number of hospital admissions among the educated group dropped 40 percent, as did the number of emergency department visits

Education

• A similar program, stratified by disease severity, at the National Jewish Medical Research Center also included aggressive patient education
  • After 6 months, patients who received the education reported 77 percent fewer missed days of work and 56 percent fewer hospitalizations

  • Clearly, a straightforward education strategy can be effective

Education

• And what do patients say?

  • From Pam DeNardo, a COPD patient and member of the patient advocacy group Emphysema Foundation for Our Right To Survive (EFFORTS)…

  “Many patients feel we are ‘on our own’ with this disease. We need to know what a diagnosis of COPD means and what challenges lay ahead. Many of us are unsure where to turn for help. In talking with other patients, I’ve found that many are despondent and feel helpless.

  “We need direction, advice, and education. We know that patients connected with advocacy groups fare better and feel more informed. ‘The more aware, the better the care’ could be our slogan. Unfortunately, 83 percent of patients are unaware that patient groups are available.

  “Although the Internet harbors much useful information and support for COPD, approximately 80 percent of patients report little or no access to the Internet. That means we need to reach patients through other channels. Patient education improves outcomes and reduces costs. The desire and need for more and better information is extremely high, but we’ve got a long way to go.”

Education

• So patients are ill informed, or at least feel they are

  • But, how informed are healthcare providers?

Education

• During the past 8 years, there has been an explosion of professional guidelines for the management and treatment of COPD

  • However, awareness among physicians is low — Approximately 45 percent of primary care physicians and 6 percent of pulmonologists do not know that COPD guidelines exist
Education

- The various guidelines are similar to some degree
  - 98 percent present a definition of COPD
  - 98 percent recommend lung rehabilitation
  - 83 percent recommend spirometry for diagnosis

Education

- However, physician adherence is not uniform
  - Only 32 percent of primary care physicians and 79 percent of pulmonologists state they use spirometry for diagnosis all the time
  - Primary care physicians report they refer patients for lung rehabilitation routinely only 19 percent of the time, and with pulmonologists, the figure is 54 percent

So, How Are We Doing?

How Are We Doing?

- The only treatment effective against progression of the disease is smoking cessation.
- The only treatment proven to prolong life is oxygen supplementation in patients with oxygen insufficiency

How Are We Doing?

- Although treatment cannot fully reverse airflow obstruction, it can improve quality of life
  - Bronchodilators temporarily improve airflow obstruction and alleviate immediate symptoms
  - Some drugs decrease the frequency of exacerbations

How Are We Doing?

- Unfortunately, all of these treatments are underused
- The public, patients, and physicians often believe that treatments are not useful
- This is untrue – the treatments we have are not perfect, but they help many patients
How Are We Doing?

• *Healthy People 2010* set two goals for COPD:
  - reduce the proportion of adults older than 45 whose activities are limited by chronic lung problems
  - reduce deaths from COPD among all adults

How Are We Doing?

• These goals will be hard to achieve
  - COPD develops and progresses insidiously, causing symptoms only when the loss of pulmonary function becomes severe enough to interfere with usual activities

How Are We Doing?

• So, there is a large reservoir of preclinical COPD patients who will add to the numbers of those diagnosed with COPD as the “baby boomer” population ages

• Todd Lee, PhD, PharmD, assistant professor at Northwestern University, estimates COPD’s price tag will reach $832.9 billion in 20 years

Why Are We Doing So Poorly?

• One theory holds that patients, providers, and society are co-conspirators in denial about the prevalence and severity of COPD
  - Our built environment makes it easy to avoid symptoms
  - Many patients feel shame, blaming themselves for bringing on the disease
  - Time pressures on physicians and “therapeutic nihilism” - the belief that treatments do not work - lead to under-diagnosis and under-treatment

What Can We Do About It?

• Facts are the best remedy for denial
  - COPD is common and is growing in prevalence
  - The burden is great and becoming greater
  - COPD is easy to diagnose
  - And treatments, although not perfect, are effective, especially for patients with moderate-to-severe disease

What Can We Do About It?

• Lessening the burden of COPD will require a broad, coordinated education strategy
  - Government commitment to and community involvement in a focused plan can push us toward our goals
What Can We Do About It?

• Advocacy by patients and physicians to raise awareness within CMS is key to reimbursement and widespread adoption of COPD management techniques

• For maximum impact, legislative, educational, research, and treatment initiatives must fit together logically

Final Thought

George I. Balch, Ph.D.
Institute for Health Research and Policy
University of Illinois at Chicago

“...Too many people with COPD go undiagnosed; others get diagnosed late; and when they are diagnosed, they do not know what to expect, suffer needlessly, have needless limitations on their lives, and die too early.

“To be successful, a national education program must continue long enough, and be self-aware enough, to iron out the kinks and weather media sensations and the disease-of-the-moment syndrome. Only then will it penetrate deeply enough and spread far enough to make a true impact.”

Acknowledgments

• Primary resources
  • National Heart, Lung and Blood Institute
  Education Strategy Development Workshop - COPD
  • Global Initiative for Chronic Obstructive Lung Disease