COPD: Issues for Ambulatory Management

Ken Steinberg, MD
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Patient 1
- 64 yo man presents to your clinic for establishment of primary care. He has been a smoker of 1 ppd for 45 years. He has a history of mild HTN and is on a thiazide and ASA. Another doctor once mentioned he might have emphysema. ROS is positive for exertional dyspnea - he gets winded climbing two flights of stairs and at 3 blocks on level ground. Physical exam is normal except for mildly decreased BS and rare bibasilar crackles. SpO₂ = 95% on RA
- Does he have COPD???

Dyspnea + Smoking Hx ≠ COPD
- Differential diagnosis of chronic dyspnea
  - Emphysema, chronic bronchitis
  - Asthma
  - CHF/Cardiomyopathy
  - Ischemic heart disease
  - Interstitial lung disease (e.g., IPF, RBILD)
  - Obliterative bronchiolitis
  - Pulmonary hypertension
  - Anemia
  - Muscular weakness, deconditioning

COPD Presents in 3 Ways
- Chronic respiratory symptoms
  - Dyspnea, cough, sputum production...
- Few complaints but with a very sedentary lifestyle; lifestyle adaptation over time...then:
  - Acute exacerbation

Physical Examination
- Can be normal, or:
  - Decreased BS, wheezes, crackles
  - Hyperinflation, diaphragm depressed, decreased diaphragm excursion
  - Typical positioning, accessory muscle use, Hoover’s sign
  - Signs of cor pulmonale
  - Clubbing?

The “Classic” COPD CXR
- Upper Lobe Hyperlucency
- Narrow Cardiac Shadow
- Hyperinflation
- Flattened Diaphragms
The Lateral CXR in COPD:
Big Retrosternal Airspace; Flat diaphragms

Patient 1 - PFTs
- FEV1 of 1.38 (44% predicted)
- FEV1/FVC ratio of 0.62
- TLC 126% predicted
- DLco 52% predicted.
- On a 6-minute walk, he went 300 meters.

- Does he have airflow obstruction?
- How severe is his COPD?
- How should he be managed?

Pulmonary Function Testing in COPD

- Spirometry:
  - Low FEV1 and low-normal FVC
  - Low FEV1/FVC ratio
- Lung Volumes
  - High TLC: “Hyperinflation”
  - High RV: “Air-Trapping”
- Bronchodilator Response:
  - May or may not be present
  - (+) if FEV1 increases by 12% and 200 cc

Diagnostic Hallmark

GOLD Stages of COPD
www.goldcopd.com

<table>
<thead>
<tr>
<th>Stage</th>
<th>FEV1/FVC &lt; 0.70 and:</th>
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<tbody>
<tr>
<td>I (Mild)</td>
<td>FEV1 ≥ 80% predicted</td>
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<tr>
<td>II (Moderate)</td>
<td>FEV1 50 - 79% predicted</td>
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<tr>
<td>III (Severe)</td>
<td>FEV1 30 - 49% predicted</td>
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<tr>
<td>IV (Very severe)</td>
<td>FEV1 &lt; 30% or &lt; 50% and chronic resp. failure</td>
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Severity Guides Therapy: GOLD Guidelines

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Short-Acting Bronchodilators
Long-Acting Bronchodilators
Inhaled Steroids or Combo LABA

Use even if there is no bronchodilator response on PFTs

Approach to Pharmacotherapy
GOLD Stage

<table>
<thead>
<tr>
<th>GOLD Stage</th>
<th>SA-BD PRN (Albuterol, ipratropium)</th>
<th>SA-BD PRN (combination)</th>
<th>Albuterol PRN + Tiotropium</th>
<th>SA-BD PRN LABA (salmeterol, formoterol)</th>
<th>Albuterol PRN Tiotropium LABA or ICS</th>
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POET-COPD: Tiotropium reduced the risk of exacerbation

Hazard ratio 0.83 (95% CI 0.77-0.90)
P < 0.001 by log rank test

Effect even stronger in reducing the risk of severe exacerbations

COPD is a Systemic Disease
- Respiratory symptoms
- Cachexia, loss of body fat mass
- Skeletal muscle wasting
- Osteoporosis
- Depression
- Normochromic, normocytic anemia
- Increased risk of cardiovascular disease
  - Associated with an increased CRP

Pharmacotherapy: Goals
- Prevent and decrease symptoms
- Reduce severity and frequency of exacerbations
- Improve health status
- Improve exercise capacity
- Prevent disease progression
- Reduce mortality

Question
- Which of the following therapies reduces progression of disease (slows rate of loss of lung function) in patients with COPD
  - Advair (salmeterol/fluticasone)
  - Spiriva (tiotropium)
  - Smoking cessation
  - Pulmonary rehabilitation
  - Oral corticosteroids (prednisone)

Question
- Which of the following therapies reduces mortality in patients with COPD
  - Advair (salmeterol/fluticasone)
  - Spiriva (tiotropium)
  - Pulmonary rehabilitation
  - Long-term oxygen therapy
  - Oral corticosteroids (prednisone)
Question

- Which of the following therapies improve morbidities and QOL in patients with COPD
  - Advair (salmeterol/fluticasone)
  - Spiriva (tiotropium)
  - Pulmonary rehabilitation
  - Long-term oxygen therapy
  - Oral corticosteroids (prednisone)
  - Antidepressants

TORCH and UPLIFT Negative in terms of Primary Outcomes

- Salmeterol + fluticasone did not reduce all cause mortality (TORCH: Calverley et al. NEJM 2007:356:775-89)
- Tiotropium did not slow the decline in lung function over 4 years (UPLIFT: Tashkin et al. NEJM 2008:356:1543)
- Secondary outcomes were positive:
  - All 3 drugs improved respiratory health status and reductions in exacerbations, but effects small
  - Some additive effect of salmeterol + fluticasone
  - Salmeterol/fluticasone and tiotropium reduced COPD hospitalization rates
  - Salmeterol and tiotropium not a/w increased risk of death or major cardiovascular adverse events

Long-Term Oxygen Therapy: Indications

- PaO$_2$ ≤ 55 mm Hg or SaO$_2$ ≤ 88%
  - Rest or exercise
- PaO$_2$ ≤ 59 mm Hg or SaO$_2$ ≤ 89%
  - Erythrocytosis (HCT > 55%)
  - Clinical evidence of cor pulmonale, right-sided heart failure

Long-Term Oxygen Therapy Improves Survival

- PaO$_2$ ≤ 55 mm Hg or SaO$_2$ ≤ 88%
  - Rest or exercise
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What Is Pulmonary Rehabilitation?

- Multidisciplinary Program
- Components:
  - Exercise training (upper and lower extremity)
  - Education
  - Nutritional therapy
  - Behavioral/Psychosocial Interventions
  - Promotion of long-term adherence
- Candidates: Any motivated, symptomatic stable patient

Documented Benefits of Pulmonary Rehabilitation

- Improved exercise endurance and efficiency
- Improved health-related quality of life
- Decreased perceived intensity of breathlessness
- Decreased hospitalizations
- Decreased days in hospital
- Decreased anxiety and depression
Local Pulmonary Rehab
- HMC Outpatient OT/PT “Fitness Program”
- NW Therapy Center; Northgate
  - Accepts Medicare and Medicaid

When to Refer to a Pulmonologist
- Unsure of the diagnosis
  - Confusing picture
  - Rare forms of the illness - Alpha-1 antitrypsin def.
  - Occupational lung disease
- Difficult to control disease
  - Frequent exacerbations
  - Chronic oral steroids
  - Consideration of advanced therapies
    - e.g., Surgical treatment for COPD

Assessing a COPD Patient in Clinic
- Breathlessness
- Wheezing, chest tightness, cough
- Change in color or volume of sputum
- Exercise tolerance, ADLs
- Malaise, fatigue
- Depression
- Confusion
- Fever
- Peripheral edema
- \( \text{SpO}_2 \)

Patient 1
- 64 yo man returns to your clinic after 8 months. He has stopped smoking! He is on ASA, HCTZ, tiotropium, budesonide, and albuterol PRN.
- He is complaining of 10 days of worsening dyspnea and increased whitish-yellow sputum production, now even dyspneic with walking to the bathroom.
- Exam: AF, mild increased WOB, no JVD or edema, diminished BS with prolonged exhalation, no crackles. \( \text{SpO}_2 = 94\% \) on RA

How to Assess Severity of an Acute Exacerbation
- Duration of symptoms
- Frequency & severity of breathlessness and coughing attacks
- Sputum volume and color
- Limitation of ADLs
- Comparison to previous exacerbations
- Change in level of alertness
- PEF < 100 mL

How Will You Manage Him Now?
- Admit him
- Measure spirometry
- Refer to a pulmonologist
- Increase his dose of formoterol/budesonide
- Add home oxygen
- **Treat him with prednisone +/- antibiotics**
- Culture his sputum
**Steroid Dosing**
- 0.5 – 1 mg/kg/day prednisone equivalent
- 8 – 15 days
- Outcomes not improved with Rx > 15 days
- Generally tapering every 2 – 3 days
- Ken’s fabulous Chest Clinic taper (15 d):
  - 40 mg x 3d, 30 mg x 3d, 20 mg x 3d, 10 mg x 3d, 5 mg x 3 d
- UW Boise VA Trial taper (9 d)
  - 60 mg x 3d, 40 mg x 3d, 20 mg x 3d
- GOLD recommendation: 40 mg daily x 10 d

**Indications for ER Assessment or Hospital Admission**
- Marked increase in intensity of sxs
- Severe COPD
- Onset of new physical findings
  - e.g., cyanosis, LOC, peripheral edema
- New arrhythmias
- Diagnostic uncertainty
- Significant comorbid conditions
- Frequent exacerbations
- Older age
- Insufficient home support
- Failure to respond to initial management

**Summary**
- Don’t diagnose COPD without spirometry
  - Could be something else
  - All the recs are tied to staging which is tied to FEV₁
- GOLD staging for approach to management
- Smoking cessation
- Annual influenza vaccine & Pneumovax
- Assess need for LTOT for mortality benefit
- Look for depression
  - Treatment helps!

**Summary**
- Treat exacerbations with prednisone
  - Low threshold for antibiotics (e.g., macrolides)
- Rarely use theophylline
- Rarely use chronic oral steroids
- Consider pulmonary rehabilitation
- Surgical options for future talks
  - LVRS
  - Lung transplantation
  - Low-dose CT scans for lung cancer screening