To Breathe or Not To Breathe

That Is the Question

April 22nd, 2012

NMNPC Conference
Objectives

- Identify and perform early screening tools for probable COPD patients
- Types of treatment for COPD both pharmacological and non-pharmacological.
Key Indicators For Diagnosing COPD

- Consider COPD and perform Spirometry if any of these indicators are present in an individual over the age of 40. Although non-diagnostic themselves, the presence of multiple indicators increases the probability of a COPD diagnosis. Spirometry is REQUIRED to make a diagnosis of COPD.
  
  - Dyspnea that is:
    - Progressive over time
    - Characteristically worse with exercise
    - Persistent
  
  - Chronic cough
    - May be intermittent or nonproductive
Dyspnea Indexes

- Borg
- Modified Medical Research Council (MMRC) Dyspnea Scale
- Modified Dyspnea Scale
# Dyspnea Scale

<table>
<thead>
<tr>
<th>Severity</th>
<th>Score</th>
<th>Level of Breathlessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>0</td>
<td>Not troubled with breathlessness except with strenuous exercise</td>
</tr>
<tr>
<td>Mild</td>
<td>1</td>
<td>Troubled by shortness of breath when hurrying or walking up a slight hill</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
<td>Walks slower than people of the same age due to breathlessness or has to stop for breath when walking at own pace on the level</td>
</tr>
<tr>
<td>Severe</td>
<td>3</td>
<td>Stops for breath after walking approximately 100 meters or after a few minutes on the level</td>
</tr>
<tr>
<td>Very Severe</td>
<td>4</td>
<td>Too breathless to leave the house or breathless when dressing or undressing</td>
</tr>
<tr>
<td>Grade</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Mild, noticeable to patient, not to observer</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Some difficulty, noticeable to observer</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Moderate difficulty, but can continue</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Severe difficulty, patient cannot continue</td>
<td></td>
</tr>
</tbody>
</table>
### Dyspnea Scales

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>NONE</td>
</tr>
<tr>
<td>0.5</td>
<td>VERY, VERY SLIGHT (just noticeable)</td>
</tr>
<tr>
<td>1</td>
<td>VERY SLIGHT</td>
</tr>
<tr>
<td>2</td>
<td>SLIGHT</td>
</tr>
<tr>
<td>3</td>
<td>MODERATE</td>
</tr>
<tr>
<td>4</td>
<td>SOMEWHAT SEVERE</td>
</tr>
<tr>
<td>5</td>
<td>SEVERE</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>VERY SEVERE</td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>VERY, VERY SEVERE (almost maximal)</td>
</tr>
<tr>
<td>10</td>
<td>MAXIMAL</td>
</tr>
</tbody>
</table>
Spirometry - Introduction

- Spirometry is the gold standard for COPD diagnosis
- Underuse leads to inaccurate COPD diagnosis
- Widespread uptake has been limited by:
  - Concerns over technical performance of operators
  - Difficulty with interpretation of results
  - Lack of approved local training courses
  - Lack of evidence showing clear benefit when spirometry is incorporated into management
Why Perform Spirometry?

• Measure airflow obstruction to help make a definitive diagnosis of COPD
• Confirm presence of airway obstruction
• Assess severity of airflow obstruction in COPD
• Detect airflow obstruction in smokers who may have few or no symptoms
• Monitor disease progression in COPD
• Assess one aspect of response to therapy
• Assess prognosis (FEV$_1$) in COPD
• Perform pre-operative assessment
Standard Spirometric Indicies

- **FEV<sub>1</sub>** - *Forced expiratory volume in one second:* The volume of air expired in the first second of the blow

- **FVC** - *Forced vital capacity:* The total volume of air that can be forcibly exhaled in one breath

- **FEV<sub>1</sub>/FVC ratio:** The fraction of air exhaled in the first second relative to the total volume exhaled
## COPD Spirometric Classification

### Table 2. Classification of COPD Severity by Spirometry [7]

<table>
<thead>
<tr>
<th>Stage</th>
<th>Criteria</th>
</tr>
</thead>
</table>
| Stage I: Mild  | FEV$_1$ $>80\%$ predicted  
FEV$_1$/FVC $< 0.70$                                                   |
| Stage II: Moderate | 50% $\leq$ FEV$_1$ $< 80\%$ predicted  
FEV$_1$/FVC $< 0.70$                                                   |
| Stage III: Severe | 30% $\leq$ FEV$_1$ $< 50\%$ predicted  
FEV$_1$/FVC $< 0.70$                                                   |
| Stage IV: Very Severe | FEV$_1$ $< 30\%$ predicted or  
FEV$_1$ $< 50\%$ predicted  
plus chronic respiratory failure |

The Faces of COPD
Meet Irene

- 52 year old female
- 28 pack/year smoking history
- $\text{FVC}/\text{FEV}_1 < 0.7$, with $\text{FEV}_1 < 30\%$ predicted
- On tiotropium, mometasone, prn albuterol, nocturnal oxygen at 1L/NC
- Activity level: runs her own business, walks on treadmill 15 minutes each day
- Has been seen for lung transplant-not quite candidate because QOL too good
Meet Dan

- 57 year old male
- 45 pk/year smoking history
- FVC/FEV$_1$ < 0.7, with FEV$_1$ < 20% predicted
- On, azithromycin, arformoterol+budesonide nebs bid, albuterol + ipatropium nebs bid, prednisone 7.5 mg/day, guaifenesin 1200 mg bid, oxygen 5L/NC-8 L/NC with exertion, BiPAP at night
- Activity Level: works part-time, can walk 100 ft at a time
Meet June

• 71 year old female
• 50 pack/year smoking history
• FVC/FEV$_1$ < 0.7, with FEV$_1$ < 50% predicted
• On nebulized albuterol+ipatropium, fluticasone+salmeterol, prednisone 10 mg/day, oxygen at 4L/NC, frequent albuterol MDI use
• Activity Level: walks around her house only, is being considered for hospice
Meet Henry

- 70 year old male
- 80 pack/year smoking history
- FVC/FEV$_1$ < 0.7, with FEV$_1$ < 50% predicted
- On fluticasone+salmeterol bid, tiotroprium every day, albuterol prn, oxygen at 2L/NC
- Activity level: bed to bathroom to chair
Goals for the COPD Patient

• Reduce symptoms
  – Relieve symptoms, i.e. medication
  – Improve exercise tolerance
  – Improve health status

• Reduce risk
  – Prevent disease progression
  – Prevent and treat exacerbations
  – Reduce mortality
Pharmacotherapy

• Start with bronchodilators
  – Beta agonists
    • Short acting, i.e. albuterol, levalbuterol
    • Long acting, i.e. salmeterol, formoterol
  – Anticholinergics
    • Short acting, i.e. ipatropium
    • Long acting, i.e. tiotropium
    • Do not prescribe both a short acting and long acting anticholinergic at the same time
  – Combination
    • Short acting, albuterol + ipatropium either as MDI or nebulized
Pharmacotherapy (continued)

• If no improvement in clinical status/function
  – Glucocorticosteroids, i.e. beclamethasone, fluticasone, mometasone
  – Glucocorticosteroids + LABA, i.e. fluticasone +salmeterol, budesonide+formoterol, mometasone+formoterol, arformoterol +budesonide (nebulized)
  – Oral steroids, prednisone or methylprednisolone
Pharmacotherapy (continued)

• To prevent or reduce frequency of exacerbations
  – Azithromycin
  – Roflumilast

• Adjuncts
  – Mucolytics/Expectorants
Improving Exercise Tolerance

- Pulmonary Rehab
  - Provides increased functionality
  - Provides disease education
Pulmonary Rehabilitation

According to the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR), demonstrated outcomes of pulmonary rehabilitation include:

• Improved quality of life
• Reduced hospitalizations and use of medical resources
• Reduced respiratory symptoms (e.g., dyspnea)
• Increased exercise tolerance and performance
• Enhanced ability to perform activities of daily living
• Increased knowledge about pulmonary disease and its management
Program Specifics

- Requires a physician referral
- Requires a pulmonary diagnosis
- Most insurances will cover all or part of the payment
- 24 visits of exercise and education classes
Program Components

• Pre and post program individual fitness assessment
• Education/Training
• Individualized exercise prescription
• Psychosocial support
• Guidance and assistance resources
• After rehab
New Mexico Pulmonary Rehab Programs

- Alamogordo
  - Gerald Champion Regional Medical Center
- Albuquerque
  - Lovelace Wellness Center
  - Presbyterian Healthplex
- Artesia
  - Artesia General Hospital
- Farmington
  - San Juan regional Medical Center
- Lovington
  - Nor-Lea General Hospital
- Santa Fe
  - St Vincent’s Hospital
References

- Global Initiative for Chronic Obstructive Lung Disease (GOLD) - [www.goldcopd.org](http://www.goldcopd.org)
- [http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2915539/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2915539/) (roflumilast)