COPD
Take it one breath at a time

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Objectives

- Understand the definition of COPD (Chronic Pulmonary Disease)
- Understand the components of assessment for COPD
- Understand tests involved in the diagnosis of COPD
- Understand the magnitude of smoking as it relates to COPD and identify various smoking cessation strategies
- Understand current medications and devices in the rescue and maintenance therapies for COPD
- Understand how to communicate with COPD patients
- Understand long term oxygen therapy and new technologies for providing stationary and ambulatory oxygen therapies

What is COPD?

- COPD stands for Chronic Obstructive Pulmonary Disease
  - Chronic means it won’t go away
  - Obstructive means the airway is partly blocked
  - Pulmonary means the lungs
  - Disease means sickness
What is COPD? (continued)

- When you breathe in, the airways carry the air to the alveoli where CO2 and O2 are exchanged. With COPD, the airways become thick and swollen increasing difficulty in getting air to alveoli.
- Leads to structural changes and narrowing of the small airways
- COPD cannot be cured, but symptoms can limited to slow damage to the lungs

The Umbrella of COPD

- **Emphysema** or destruction of the alveoli
- **Chronic Bronchitis** or inflammation of the bronchiolite tubes leading to chronic mucous production and cough

The American Thoracic Society has defined COPD as a disease state characterized by chronic airflow limitation due to chronic bronchitis and emphysema.

Differential Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Asthma</th>
<th>COPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>Early in life (often childhood)</td>
<td>Later in life</td>
</tr>
<tr>
<td>Etiology</td>
<td>Immunologic stimuli, family history of asthma</td>
<td>Cigarette smoking, exposure to other risk factors</td>
</tr>
<tr>
<td>Course</td>
<td>Intermittent</td>
<td>Chronic, progressive</td>
</tr>
<tr>
<td>Airflow limitation</td>
<td>Largely reversible</td>
<td>Partially reversible</td>
</tr>
<tr>
<td>Clinical feature</td>
<td>Wheezes, chest tightness, dyspnea, cough</td>
<td>Chronic cough/ spuitum, persistent or worsening dyspnea</td>
</tr>
</tbody>
</table>
Assess COPD Comorbidities

COPD patients are at increased risk for:
- Cardiovascular diseases
- Osteoporosis
- Respiratory infections
- Anxiety and Depression
- Diabetes
- Lung cancer
- Bronchiectasis

These comorbid conditions may influence mortality and hospitalizations and should be looked for routinely, and treated appropriately.

Chronic Obstructive Pulmonary Disease (COPD)

Normal Lung

Emphysema Lung

Chronic Bronchitis

- Characterized by chronic sputum production

Normal

- Airway held open by alveolar attachments

COPD

- Disrupted alveolar attachments (emphysema)
- Mucous inflammation, fibrosis

Airway obstructed by
- Loss of attachment
- Mucous inflammation
- Fibrosis
- Mucous obstruction of lumen

Typical COPD Patient
- Elderly
- Smoked for years
- Multiple comorbidities
- Significantly limited by disease

Burden of COPD
- COPD is a leading cause of morbidity and mortality WORLDWIDE
- The burden of COPD is projected to increase in coming decades due to continued exposure to COPD risk factors and the aging of the world’s population
- COPD is associated with SIGNIFICANT economic burden
COPD

- Affects an estimated 24 million adults in the US (12 million under-diagnosed)
- Represents approximately 5-6% of the US population
- Is the fourth leading cause of death in the US
  - Somebody dies from COPD once every 4 minutes
  - COPD has a 30% mortality rate over a 5 year period
- Individuals with COPD on average experience two exacerbations per year


COPD (continued)

- Responsible for:
  - 8 million doctor office visit/year
  - 1.5 million ER visits annually
  - 726,000 hospitalizations per year
- COPD is the second leading cause of disability in the US
- Cost to the US government is approximately 42.6 billion (primarily due to hospitalizations)


COPD Readmission Penalties

- Section 3025 of the Affordable Care Act
- CMS to publicly report COPD mortality and readmission rates on Hospital Compare
- October 2014, hospitals will be penalized for COPD patients that are readmitted to hospital from home within 30 days of discharge
- Most hospitals have established outpatient chronic illness programs for monitoring and education in hopes of decreasing readmissions

Readmission

- High readmission rates considered marker of lower quality care
- Approximately 19% of acute hospital admissions readmitted within 30 days.
- This percentage has remained steady over several years
- 13% of acute hospital readmissions are potentially preventable

Today’s Concerns

- COPD is the only disease for which incidence and mortality rates are increasing
- COPD is under-recognized and under-tested

COPD Physical Appearance

- Chronic Bronchitis – “Blue Bloaters”
  - Patient may be obese, but still have muscle wasting
- Emphysema – “Pink Puffers”
  - Patient thin with barrel chest
Diagnosis Tools

- Smoking history
- Physical Exam
- Spirometry
- Alpha-1 antitrypsin deficiency screening

Diagnosing COPD

- Patient History
  - Exposure to risk factors
- Presentation of symptom development
  - Resting tachypnea, tachycardia, and wheezing
  - Diminished breath sounds
- Physical Signs
  - Frailty
  - Large barrel-shaped chest
  - Low, flat diaphragm
  - Prominent accessory respiratory muscles in neck and use of accessory muscles in respiration

Diagnosing COPD (continued)

- Six minute walk
- Chest X-ray or CT scan
  - Hyperinflation
- Pulmonary Function Test
  - Prolonged expiration time
- Blood Gas Testing
  - Measures the amount of CO2 and O2 in blood
  - Comorbid disorders
Detailed Medical History

- Past medical history
- Childhood illnesses
- Occupational Exposures
- Presence of asthma, GERD, allergic rhinitis, chronic sinusitis, OSA
- Impact of disease on activities of daily living
- Family support
- Social support

Alpha – 1 Antitrypsin Deficiency (AAT Deficiency)

- AAT is a protective protein found in the lungs and bloodstream
- Made in the liver
- Transported to blood where it bathes all tissues
- AAT deficiency in a genetic condition causing decreased levels of AAT (about 10-15% of normal levels)

Alpha – 1 Antitrypsin Deficiency

- Affects approximately 100,000 individuals in the USA (estimated 6,000 undiagnosed)
- Can result in serious lung and liver disease
- Approximately 20 million individuals carry at least one abnormal gene in the US
- *If doctors tested all their COPD patients for Alpha-1 deficiency, as many as 150,000 patients with alpha-1 deficiency and COPD would be identified*
AAT Testing

- Less than 10% of alphas have been correctly diagnosed
- The American Thoracic Society recommends testing of AAT levels for ALL COPD patients
- Early detection of deficiencies is important
  - Specifically designed treatment is required
  - Family members need to be tested

Spirometry

- A noninvasive pulmonary function test that measures airflow
- Screening to confirm definitive COPD diagnosis
- Spirometry distinguishes COPD from asthma and categorizes the severity of disease
- Measure the maximum volume of air forcibly exhaled and the amount of time to do so
- Expiratory airflow limitation is hallmark physiologic change in COPD
- Underutilized: only 21-35% of PCP order spirometry testing for symptomatic smokers

Spirometer FVC and FEV1

- FVC – the total volume of air that can be exhaled forcibly from the point of maximal inspiration. It is a measure of how effectively the lungs can be emptied
- FEV1 – the volume of air exhaled in the first second under force. It is a measure of how quickly the lungs can be emptied
- The spirometric criterion required for a diagnosis of COPD is an FEV1/FVC ratio of 0.70
Pulmonary Function Flow-Volume Loop

GOLD Classifications COPD Stages

<table>
<thead>
<tr>
<th>Stage</th>
<th>COPD</th>
<th>FEV1/FVC</th>
<th>FEV1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Mild COPD</td>
<td>&gt;0.7</td>
<td>≥80%</td>
</tr>
<tr>
<td>II</td>
<td>Moderate COPD</td>
<td>0.7</td>
<td>50-79%</td>
</tr>
<tr>
<td>III</td>
<td>Severe COPD</td>
<td>&lt;0.7</td>
<td>30-49%</td>
</tr>
<tr>
<td>IV</td>
<td>Very Severe COPD</td>
<td>&lt;0.7</td>
<td>&lt;30% or &lt;50% normal with chronic respiratory failure present</td>
</tr>
</tbody>
</table>

EMPHYSEMA

- Hyperlucent lung fields
- Multiple blebs
- Avascular zones
- Prominent pulmonary arteries
- Flattening of diaphragm
Chronic Bronchitis

- Cannot be diagnosed by x-ray
- Prominent lung markings
- Thickened bronchial walls

Systemic Features of COPD1

- Nutritional deficiencies (majority of COPD patients are Vitamin D deficient)
- Weight loss with decreased fat-free mass/anorexia
- Skeletal muscle wasting and weakness
- Cardiovascular *
- Cor pulmonale
- Pulmonary hypertension
- Risk of CAD
- Osteoporosis/bone fractures
- Depression
- Sleep disorders
- Diabetes
- Renal insufficiency
- Anemia

* More patients with COPD are believed to die from acute cardiac events than from respiratory failure2

Sources: 1GOLD 2009; 2Eur Respir J 2007

Risk Factors for COPD

Aging Populations

Sources: Global Initiative for Chronic Obstructive Lung Disease; Global Strategy for Diagnosis, Management and Prevention of COPD; 2014.
### What Causes COPD?

- **Tobacco smoke**
  - Approximately 80-90% of COPD patients are current or former smokers\(^1\)
  - Estimated that 50% or more of all smokers develop COPD\(^2,3\)

- **Exposure to fine particles**
  - Occupational irritants (dust, chemicals, toxic fumes)
  - Indoor and outdoor pollution

- **Age (>40 years old)**

- **Malnutrition**

**Sources:**

### What Causes COPD? (continued)

- **Socioeconomic status**

- **History of asthma or other severe respiratory infections**

- **Genetic factors**
  - Family history of COPD or other respiratory disease
  - Alpha-1 antitrypsin (AAT) deficiency


### Smoking and COPD

Cigarette smoking causes approximately 85% of cases of COPD.

- Tobacco use is leading cause of preventable morbidity and mortality in US
- Evidence that smoking cessation relieves symptoms

**Smoking Cessation is that single most effective means of stopping the progression of COPD**
Tobacco

- Tobacco is from the leaf of the Nicotiana plant
- Tobacco is harvested and dried but NEVER cleaned
- Tobacco come in 2 forms:
  - Smokeless
    - Chewing tobacco
    - Snuff
  - Smoking
    - Cigarettes
    - Cigars
    - Pipe
    - Bidis
    - Kretks
    - Hookahs
    - Self-rolled cigarettes

Nicotine

- Nicotine is found in the tobacco leaf and can kill at high doses
- The amount in cigarettes will not kill you, but will make you addictive (some researchers say that nicotine is one of the most addictive drugs)
- For nicotine to work quickly, ammonia must be added (YES! The chemical you use to clean your house!)

Nicotine Addiction

- Nicotine enters the blood stream and travels to the brain causing a release of chemicals that deliver a “kick”
- It takes about 10 seconds for the nicotine to reach your brain
- Nicotine causes changes in the brain that can lead to addiction and dependency
- As nicotine decrease in the brain – withdrawal symptoms occur causing people to smoke again
- Over time, people start to smoke more and more to get the same response.
Chemical released by body from nicotine consumption

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dopamine</td>
<td>EXCITES THE REWARD CENTER AND CAUSES FEELING OF PLEASURE AND CALMNESS</td>
</tr>
<tr>
<td>Adrenalin</td>
<td>&quot;Fight of flight&quot; feeling known as &quot;adrenalin rush&quot; Heart rate, breathing, blood pressure, and sugar levels quickly rise. Blood vessels constrict.</td>
</tr>
<tr>
<td>Serotonin</td>
<td>CALMS YOU AND HELPS YOU THINK AND CONCENTRATE</td>
</tr>
<tr>
<td>Beta-Endorphins</td>
<td>NATURELY MADE OPIATES IN THE BRAIN AND BODY THAT REDUCE PAIN</td>
</tr>
<tr>
<td>Monoamine Oxidase (MAO)</td>
<td>BRAIN CHEMICAL THAT HELPS BREAKDOWN DOPAMINE. SINCE SMOKING DECREASES MAO, DOPAMINE LEVELS ARE EVEN HIGHER</td>
</tr>
</tbody>
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Joint Commission Mandate

- "Smoking cessation advice/counseling is required for all adults (18 and older), who smoke cigarettes anytime during the year prior to hospitalization and have acute MI, heart failure, or pneumonia.

- Adult smoking cessation counseling defined as medical documentation that patient received one of the following: advice, brochure/booklet, handout, an aid (nicotine gum, patch), or viewed video
Smoking Cessation

- Surgeon General’s Report of 1964
  - Opened our eyes to health consequences
  - Initially, considered tobacco use as a “habit”
  - Focus was on psychological versus physiological aspects of smoking
  - Clarified and cited nicotine to be a powerful and highly addictive drug
  - Shift in thinking from habit to addition
  - Warranting long-term and sustained effort

Smoking Cessation Interventions

- Behavioral: physician/practitioner’s advice, individual counseling, group counseling, telephone counseling, self-help
- Pharmacologic: nicotine replacement therapy
- Alternative: acupuncture, hypnosis

Triggers that increase the desire to smoke

- After eating
- Talking on the phone
- Working on the computer
- Boredom
- Stress
- Breaks at work
- With coffee
- When you are happy
- Drinking alcohol
- Watching TV
- Driving the car
- Anger
- During the holidays
- After sex or exercise
- When you are sad
Nicotine Withdrawal Symptoms

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Occurs when nicotine levels in the brain drop.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>Intense craving</td>
</tr>
<tr>
<td>Chest Tightness</td>
<td>Irritability</td>
</tr>
<tr>
<td>Constipation</td>
<td>Post nasal drip</td>
</tr>
<tr>
<td>Depression</td>
<td>Problems thinking</td>
</tr>
<tr>
<td>Dizziness</td>
<td>Sadness</td>
</tr>
<tr>
<td>Fatigue</td>
<td>Trouble Thinking</td>
</tr>
<tr>
<td>Headaches</td>
<td></td>
</tr>
</tbody>
</table>

Consequences of Airflow limitation

COPD

- Exacerbations
- Air Flow Limitation
- Breathing
- Inactivity
- Reduced Exercise Capacity

Disability
Disease Progression
Death

Treatment to reduce the frequency of exacerbations is imperative as the frequencies of COPD exacerbations worsen health status and accelerates declines in pulmonary functions.
Goals of COPD Management

- Relieve symptoms
- Prevent disease progression
- Improve exercise tolerance
- Improve health status
- Prevent and treat complications
- Prevent and treat exacerbations
- Reduce hospitalizations and mortality
- Prevent or minimize adverse effects from treatment

Patient Education

- COPD is “10% medication and 90% education”
- Encourage patients to ask questions and seek information pertaining to:
  - Disease process
  - Precipitating factors
  - Reasons for treatment
  - Expected outcomes of treatment
  - Breathing exercises
  - Use of a peak flow meter
  - Proper use of inhalers and nebulizer treatments
  - Guidance on how to stop smoking
Immunizations

- Bacterial infections are present in up to 50% of all COPD cases, and approximately 80% of all COPD exacerbations are caused by viral or bacterial infections.
- Annual influenza vaccine - reduces serious illness and death in COPD patients by at least 50%
- Pneumococcal vaccine - to be given as a one-time dose in those 65 or older (those < 65 and five years having elapsed should receive a second dose)

Sources: Respiratory Care 2005

Bronchodilator Therapy

- Central to COPD management
- Prescribed on an as-needed or regular basis to prevent or reduce symptoms
  - Beta_2 (B2) - agonists
  - Anticholinergics (antimuscarinics)
  - Theophylline
  - Combination therapy
- Always use a bronchodilator first whenever using multiple inhalers

Benefits

- Relieves symptoms
- Improves pulmonary function
- Enhances better quality of life
- Prevents and treats exacerbations
- Increases exercise tolerance
Nebulizers are regulated by the US Food and Drug Administration (FDA) and are used for the administration of aerosol generators that convert drug suspensions into aerosols that deposit into the patient’s lower respiratory tract.

Nebulizers are utilized to deliver bronchodilators, steroids, or a combination to the lungs.

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**Prescription - Required**

- Type of therapy
- Name of medication
- Drug dosage
- Frequency of therapy

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**Nebulizer Compressor**

- What is a nebulizer?
- An air compressor that generates compressed air to turn your liquid medication into a mist to be deposited deep into the lungs
### Advantages
- Capability of aerosolizing many drug solutions
- Ability to aerosolize drug mixtures
- Minimal patient cooperation or coordination is needed
- Drug concentrations and dose can be modified
- Normal breathing pattern can be used

### Disadvantages
- Treatment times may range from 5-25 minutes
- Equipment may be large
- Need power source
- Potential drug delivery into the eyes
- Variability in performance characteristics among different models
- Assembly and cleaning is required
- Possible contamination with improper handing of drugs and inadequate cleaning

### Hazards of Aerosol Therapy-Patient
- Adverse Reaction to medication: headache, insomnia, nervousness
- Bronchospasm
- Drug Concentration
- Infection
- Eye Irritation
Hazards of Aerosol Therapy - Caregivers

- Exposure to Secondhand aerosol drugs
- Infection

Medications used in Nebulizers

- Bronchodilators
  - Relax the smooth muscles of the bronchi decreasing airway resistance and improving airflow to the lungs.
- Corticosteroids
  - Reduce inflammation of bronchi and reduces mucus produced
  - No systemic effects
- Combination
- Mucolytic

Aerosol Drug with Corresponding Inhaler

<table>
<thead>
<tr>
<th>Albuterol Sulfate (short acting bronchodilator)</th>
<th>Albuterol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ventolin</td>
<td>Flovent</td>
</tr>
<tr>
<td>ProAir</td>
<td></td>
</tr>
<tr>
<td>Levalbuterol</td>
<td>Xopenex</td>
</tr>
<tr>
<td>Ipratropium Bromide and Albuterol Sulfate</td>
<td>Duovent, Combivent</td>
</tr>
<tr>
<td>Ipratropium Bromide</td>
<td>Atrovent</td>
</tr>
<tr>
<td>Salmeterol [long acting bronchodilator]</td>
<td>Serevent</td>
</tr>
<tr>
<td>Tiotropium</td>
<td>Syrma</td>
</tr>
<tr>
<td>Budenoside (corticosteroids)</td>
<td>Pulmicort</td>
</tr>
<tr>
<td>Fluticasone</td>
<td>Flovent</td>
</tr>
<tr>
<td>Fluticasone and Salmeterol (combination)</td>
<td>Advair</td>
</tr>
<tr>
<td>Budenoside and Formoterol</td>
<td>Symbicort</td>
</tr>
<tr>
<td>Acetylcysteine (mucolytic)</td>
<td>Mucomyst</td>
</tr>
</tbody>
</table>
Inhalers

- Types:
  - Metered dose inhalers or MDI
  - Dry power inhaler or DPI

MDI

- Advantages
  - Portable, light and compact
  - Multiple dose convenience
  - Short treatment time
  - Reproducible emitted doses
  - No drug preparation required
  - Difficult to contaminate

- Disadvantages
  - Hand-breath coordination required
  - Proper inhalation and breath-hold pattern required
  - Reaction to propellants
  - Foreign body aspiration
  - High oropharyngeal deposition
  - Difficult in knowing doses remaining in canister

Proper MDI Administration

- Seal the lips
- Actuate the MDI and breathe in slowly
- Hold breath for 10 seconds (or as long as possible)
- Wait one minute between puffs
- If taking a corticosteroid, rinse mouth and spit (Do not swallow)
Proper MDI Administration

- Remove mouthpiece and shake cannister
- Prime inhaler if it has not been used in several days
- Sit up straight
- Breathe all the way out
- Place MDI (or spacer) between teeth making sure tongue is not blocking MDI

Spacer use

- **Advantages:**
  - Reduce oropharyngeal impact and loss
  - Increased inhaled drug by 2-4 X
  - Allow use of MDI during acute dyspnea
  - Simplifies coordination need

- **Disadvantages:**
  - Large compared to MDI alone
  - More expensive
  - Some assembly required
  - Possible contamination without cleaning

Proper DPI Administration

- Remove mouthpiece cover and twist mouthpiece counter clockwise
- Place capsule into chamber
- Press buttons to pierce capsule
- DO NOT exhale through device
- Seal lips around mouthpiece
- Breathe in RAPIDLY and DEEPLY
- Hold breath for 10 seconds
- Open chamber and verify there is no power left, if so, repeat procedure
### Nebulizer vs Inhaler with Spacer

- Studies have proven that fewer than half the people using MDI use them properly so education is **vital**
- Which is better? Depends on what the doctor recommends, personal preference, and insurance coverage.

### Documentation

- Breath sounds pre- and post- treatment
- Respiratory rate pre- and post-
- Heart rate pre- and post-
- Cough – productive? Sputum – amount, tenacity, color, odor
- Response to therapy
- Education on therapy

### Supplemental Oxygen Therapy

- 17 or more hours/day can help improve survival in COPD
- Oxygen during exercise increases walking distance and endurance
- Administer oxygen to relieve acute dyspnea
Long Term Oxygen Therapy: LTOT

- **OXYGEN** is a FEDERALLY Regulated Drug – prescription should not be altered

- Clinical target SpO2 > 90% (PaO2>60mmHG)

- Stationary system provides majority of LTOT in home

- Portable system lightweight equipment for ambulation

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Effectiveness of LTOT

- Landmark studies:
  - Nocturnal oxygen therapy trial group
  - British Medical Research Council Study
  - Petty TL Bliss PL. Ambulatory oxygen therapy, exercise and survival with advanced COPD

- Key findings:
  - LTOT improves survival, exercise tolerance, quality of life
  - Continuous oxygen (≥17 hours/day) better than nocturnal only
  - Continuous LTOT with regular scheduled walking the best!
  - Sustained adherence reduces exacerbations

The primary clinical objective is to ensure adequate oxygen/saturation (SpO2 ≥ 90%) across the entire LTOT continuum at all times!

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Providing Supplemental Oxygen

- Two administration options

  - Continuous flow
    - Most common 1-4 lpm via nasal cannula
    - Is the GOLD standard when administering oxygen

  - Pulse dose delivery
    - Volume of oxygen is delivery in first 60% of inspiration
    - Objective: extend duration of oxygen contents
    - Actual pulse volume varies between devices
    - Potential for desaturation is real
Tank Safety

- All tanks should be secured by either a chain, cord, or stand to prevent them from falling.
- Do not allow oil or grease to come in contact with tanks, regulators or accessory parts
- Do not allow an open flame within 25 feet of oxygen
- Do not leave oxygen tanks “ON” when not using
- Do not store oxygen in a confined space
- Do not allow untrained persons to use or adjust equipment

Tank Safety (continued)

- Do not store oxygen near radiators, heat ducts, steam pipes or other sources of heat
- Do not open cylinder valves quickly
- Do not transport oxygen in an enclosed area or the trunk of a car
- Do transport oxygen in the back seat of your car and secure it properly
- Do open a window when transporting oxygen
- Full and empty tanks must be segregated
Nasal Cannulas

- Flowrates: 1-6
- Apply properly
- Usable on tanks, concentrators, conservers
- No petroleum, etc
- Do not wrap around neck
- Disposable-change when soiled/facility policy
- Change every 7-10 days

Simple Oxygen Mask

- Flowrates required: 6-10 lpm
- Application
- Usable on concentrators, tanks, conservers
- Disposable-change when soiled/facility policy
- DO NOT USE ON FLOWRATES <6 LPM

COPD Exacerbations

GOLD: “An event in the natural course of the disease characterized by a change in the patient’s baseline dyspnea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in a regular medication in acute in onset, and may warrant a change in regular medication in a patient with underlying COPD.”
"Normal" vs Exacerbation

<table>
<thead>
<tr>
<th>Symptom</th>
<th>&quot;Normal&quot;</th>
<th>Exacerbation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyspnea</td>
<td>With exertion</td>
<td>At rest</td>
</tr>
<tr>
<td>Cough</td>
<td>Morning</td>
<td>Frequent</td>
</tr>
<tr>
<td>Sputum</td>
<td>Clear, white</td>
<td>Yellow, green</td>
</tr>
</tbody>
</table>

Treating Exacerbations

- **Mild**
  - Bronchodilator Modification
  - Step therapy

- **Moderate**
  - Bronchodilator Modification
  - Oral corticosteroids X 2 weeks and taper
  - Empiric antibiotic 7-10 days

Treatment of COPD

- Smoker Cessation and Immunizations
- Bronchodilators
- Inhaled Corticosteroids
- Pulmonary Rehabilitation
- Oxygen
- Surgery
COPD Exacerbation Statistics

- In 2007, the cost to the nation for COPD was approximately $42.6 Billion
- In hospital mortality rate for acute COPD exacerbation is approximately 30%
- The majority of patients hospitalized with a COPD exacerbation are readmitted to the hospital within one year
- Approximately 35% of the hospitalized patients require an admission to an ICU
- Hospitalizations for COPD exacerbations in the US:
  - 1990 – 463,000
  - 2000 – 726,000
  - **57% increase in 10 years**

Warning Signs for a Flare-up

**Green Light – GOOD Signs – All is well**

- Appetite is good
- Usual amount of cough and mucus
- Sleeping well at night
- Able to maintain your usual exercise/activity level

**Yellow Light – Caution Signs – Time to Act!**

- Increase in dyspnea
- Less energy for daily activities
- Increased mucus
- Increase use of inhaler
- Swollen ankles
- Increased cough
- Poor sleep and appetite
- Medication not helping
Warning Signs for a Flare-up

- **Red Light** - DANGER – STOP! – CALL 911 or GO DIRECTLY to ER
  - Severe dyspnea
  - Unable to do any activity
  - Cannot sleep
  - Fever
  - Coughing up blood
  - Chest pain
  - Increased confusion

NonAdherence

- Only 40 to 60% of patients with COPD adhere to their prescribed regimen
- Only 17% achieve perfect adherence
- Over half of patients report missing or skipping doses of their COPD medicine

Sources: NEJM 2005; Int J of COPD 2011

Communication with the COPD Patient

- What can the HCP do to improve interaction?
  - Slow down
  - Use plain language
  - Show/draw pictures
  - Limit the amount of information provided to 2-3 key points – repeat – reinforce
  - Use the “show me” technique
  - Create a shame-free environment
Close the Gap

- Average reading level of an American adult is about 8th grade level
- Average reading level of Medicaid enrollee reported to be approximately 5th grade level
- Typical health information materials are written at the 10th grade level

***POINT: Need to close the Gap

Establish a nurturing relationship

- Project professionalism
- Strive for empowerment
- Exhibit trust
- Reveal empathy
- Allow for mutuality
- Display care
- Demonstrate compassion

***POINT: “People don’t care how much you know, until they know how much you care”

Pulmonary Rehabilitation

PR is an evidenced based, multidisciplinary, and comprehensive intervention for patients with chronic respiratory diseases who are symptomatic and often have decreased daily life activities. Integrated into individualized treatment of the patient, PR is designed to reduce symptoms, optimize functional status, increase participation, and reduce health care costs through stabilizing or reversing systemic manifestations of the disease.
Pulmonary Rehabilitation Team

- RT - medication, supplemental oxygen, infection control, airway clearance, diagnostic test
- PT – strength and endurance, ROM, body mechanics
- OT - activities of daily living, relaxation
- SW - depression, family/social issues/support
- RN - medication, physical assessment
- Chaplin - end of life, family, coping
- MD – H&P, review all testing, plan of care

Basic Equipment

- Pulse oximeter
- BP cuff
- Stethoscope
- Treadmill
- Stationary bike
- Weights
- Resistant bands
- Oxygen
- Emergency equipment

Goals of Pulmonary Rehab

- Individual treatment plan
- Integrate prevention and long-term adherence
- Increase strength, endurance, exercise
- Control/alleviate symptoms
- Decrease anxiety / depression
- Train – motivate-educate
- Reduce economic burden
Nutrition and COPD

- COPD is not just a lung disease, it is systemic
- Striving for optimum nutrition status in respiratory disease has direct impact on respiratory function
- Malnutrition directly affects both the respiratory muscles and the lung parenchyma, contributing to worsening of the underlying disease
- 50% mortality at 5 years with COPD and weight loss

Nutritional Interventions

- Consume more frequent, smaller meals
- Drink fluids before or after meals, not during
- If too tired to eat, consume high-density liquids
- Avoid gassy foods, which may cause bloating
- Increase soft foods to minimize chewing effects
- Avoid foods that are extremely hot or cold

Impact in Nursing Facilities

- Increased risk of new fractures from chronic steroid use
- Clinical drug management (use of 9 or more medications)
- Nutrition/eating deficiencies
- Physical functioning (decline in ADL's/ROM
- Quality of life (little or no activity)
- Skilled Nursing Facilities have no penalties if patients are discharged and readmitted to the SNF within any period of time
Opportunities for Nursing Facilities

- Increased admissions and occupancy
- Increased revenue
- Public and industry perception of being a quality provider
- Collaboration with hospital referral sources to coordinate care

Keys To Successful Outcomes

- Preventing COPD is better than having to treat COPD
- The most important way to decrease the risk of developing COPD is to stop smoking
- Proactive treatment and treatment advances can improve and extend lives and may also slow disease progression
- It is important to differentiate between rescue (quick-acting) and maintenance (long-acting) treatment
- Implement treatment plans that incorporate medication delivery methods in conjunction with an individual's needs, lifestyle, and preferences to maximize patient adherence

There is NO CURE for COPD
### Additional COPD Resources

- **GOLD (Global Initiative for Chronic Obstructive Lung Disease)**
  www.goldcopd.org

- **American Thoracic Society and European Respiratory Society**
  www.thoracic.org

- **American Lung Association**
  www.lungusa.org

- **National Heart, Lung, and Blood Institute**
  www.nhlbi.nih.gov

- **National Emphysema COPD Association**
  www.NECAcommunity.org

- **National Lung Health Education Program**
  www.nlhep.org

- **Pfizer/Boehringer Ingelheim**
  www.copdfoundation.org

- **Smoke Free**
  www.smokefree.gov

- **COPD Foundation**
  www.copdfoundation.org

- **Alpha – 1 Foundation**
  www.alpha-1foundation.org

- **My Alpha Test**
  www.myalphatest.com

- **FDA**
  www.fda.gov

- **EPA**
  www.epa.gov/ozone/title6/exemptions/inhalers.html

- **American Academy of Allergy, Asthma, and Immunology**
  www.aaca.org/patients/specialfeature/2003