Chronic Obstructive Pulmonary Disease (COPD)

Study Guide
Use Lewis textbook. Complete this prior to class on COPD

1. Definition of COPD – include 2 most common disorders of COPD
   Chronic obstructive pulmonary disease (COPD) refers to a group of lung diseases that block airflow and make it increasingly difficult for you to breathe.

   Emphysema and chronic bronchitis are the two main conditions that make up COPD, but COPD can also refer to damage caused by chronic asthmatic bronchitis. In all cases, damage to your airways eventually interferes with the exchange of oxygen and carbon dioxide in your lungs.

   COPD is a leading cause of death and illness worldwide. Most COPD is caused by long-term smoking and can be prevented by not smoking or quitting soon after you start. Damage to your lungs can't be reversed, so treatment focuses on controlling symptoms and minimizing further damage.
   • Non-reversible!!! Unlike asthma
   • Chronic cough – start thinking something is changing in the lungs

2. Stressors of COPD
   a. #1 – you or second hand - Exposure to tobacco smoke
   b. Occupational exposure to dusts and chemicals
   c. Gastroesophageal reflux disease
   d. Age
   e. Genetics
   f. Allergies – if they are severe for a long period of time

3. Describe pathophysiology of each disorder
   a. Chronic Bronchitis
      i. Lung damage and inflammation in the large airways results in chronic bronchitis. Chronic bronchitis is defined in clinical terms as a cough with sputum production on most days for 3 months of a year, for 2 consecutive years. In the airways of the lung, the hallmark of chronic bronchitis is an increased number (hyperplasia) and increased size (hypertrophy) of the goblet cells and mucous glands of the airway. As a result, there is more mucus than usual in the airways, contributing to narrowing of the airways and causing a cough with sputum. Microscopically there is infiltration of the airway walls with inflammatory cells. Inflammation is followed by scarring and remodeling that thickens the walls and also results in narrowing of the airways. As chronic bronchitis progresses, there is squamous metaplasia (an abnormal change in the tissue lining the inside of the airway) and fibrosis (further thickening and scarring of the airway wall). The consequence of these changes is a limitation of airflow.

   Patients with advanced COPD that have primarily chronic bronchitis rather than emphysema were commonly referred to as "blue bloaters" because of the bluish color of the skin and lips (cyanosis) seen in them.[28] The hypoxia and fluid retention leads to them being called "Blue Bloaters."
• Lukatrene – the irritant that is produced and irritated the lining of the structures and neutrophils infiltrate the lungs
• Airways are inflamed
• Increased goblet cells and mucus but they can’t move it
• Everything is narrowed
• Inflammation in bronchial tree
  1. Having to clear your throat first thing in the morning, especially if you smoke
  2. A chronic cough that produces yellowish sputum
  3. Shortness of breath in the later stages
  4. Frequent respiratory infections

b. Emphysema – hypoxia at rest, blebbing – no more elasticity
   i. Emphysema is a factor in the progression of chronic obstructive pulmonary disease (COPD), a condition that limits the flow of air when you breathe out. Emphysema occurs when the air sacs at the ends of your smallest air passages (bronchioles) are gradually destroyed. Smoking is the leading cause of emphysema.
   ii. As it worsens, emphysema turns the spherical air sacs — clustered like bunches of grapes — into large, irregular pockets with gaping holes in their inner walls. This reduces the number of air sacs and keeps some of the oxygen entering your lungs from reaching your bloodstream. In addition, the elastic fibers that hold open the small airways leading to the air sacs are slowly destroyed, so that they collapse when you breathe out, not letting the air in your lungs escape.
   iii. Airway obstruction, another feature of COPD, contributes to emphysema. The combination of emphysema and obstructed airways makes breathing increasingly difficult. Treatment often slows, but doesn't reverse, the process.
      1. Shortness of breath, especially during physical activities
      2. Wheezing
      3. Chest tightness
      4. Chronic bronchitis
      5. Chronic bronchitis occurs mainly in smokers. It's defined as a cough that you have at least three months a year for two consecutive years. People who continue to smoke may go on to develop emphysema, but in smokers who are able to quit, the cough may clear in a few days or weeks.

4. List and explain assessments of COPD (at least 10)
   a. Having to clear your throat first thing in the morning, especially if you smoke
   b. A chronic cough that produces yellowish sputum
   c. Shortness of breath in the later stages
   d. Frequent respiratory infections
   e. Shortness of breath, especially during physical activities
   f. Wheezing
   g. Chest tightness
   h. Chronic bronchitis
   i. Chronic bronchitis occurs mainly in smokers. It's defined as a cough that you have at least three months a year for two consecutive years. People who continue to smoke may go on to develop emphysema, but in smokers who are able to quit, the cough may clear in a few days or weeks.
i. Weight loss
ii. Wheezes
iii. Prolonged expiration
iv. Blurish red skin
v. Barrel chest
vi. Hyperinflation
vii. Flattened diaphragm
viii. Problems getting air out of lungs with IS
ix. Cough in morning mostly
x. Natural purse lipped breathing
xi. Hypercapnia
xii. Hemoglobin and hematocrit are up
xiii. Edema in BLLE
xiv. Activity intolerance
xv. Accessory muscles to breath
xvi. Poly
xvii. Heaviness and cough won’t go out
xviii. Hemotycis – blood in sputum, indicates infection
xix. Progressing fatigue, more severe
xx. Naturally using tripod or orthopneic position
xxi. Kids will squat – easier to get O2 around body
xxii. Hx of exposure to toxins
xxiii. Seems like asthmatic, but chronic

5. List diagnostic data and affects of COPD on diagnostic data
   a. Pulmonary function tests. Spirometry is the most common lung function test. During this test, you’ll be asked to blow into a large tube connected to a spirometer. This machine measures how much air your lungs can hold and how fast you can blow the air out of your lungs. Spirometry can detect COPD even before you have symptoms of the disease. It can also be used to track the progression of disease and to monitor how well treatment is working.
   b. Chest X-ray. A chest X-ray can show emphysema — one of the main causes of COPD. An X-ray can also rule out other lung problems or heart failure.
   c. Arterial blood gas analysis. This blood test measures how well your lungs are bringing oxygen into your blood and removing carbon dioxide.
      i. Mod to severe – decreased pH, decreased PO2, increased PCO2 – Respiratory acidosis
   d. Sputum examination. Analysis of the cells in your sputum can help identify the cause of your lung problems and help rule out some lung cancers.
   e. Computerized tomography (CT) scan. A CT scan is an X-ray technique that produces more-detailed images of your internal organs than those produced by conventional X-rays. A CT scan of your lungs can help detect emphysema and help determine if you might benefit from surgery for COPD
   f. Mild state - treatable, may not see anything yet, moderate COPD, then you will see changes
   g. Echocardiogram to evaluate heart muscle – it will have to work harder and you will get hypertrophy
   h. Exercise testing with pulse ox

6. Describe complications of COPD
a. Respiratory infections. When you have COPD, you’re more likely to get frequent colds, the flu or pneumonia. Plus, any respiratory infection can make it much more difficult to breathe and produce further irreversible damage to the lung tissue. Talk to your doctor about annual flu shots and regular pneumococcal vaccines.

b. High blood pressure. COPD may cause high blood pressure in the arteries that bring blood to your lungs (pulmonary hypertension).

c. Heart problems. For reasons that aren’t fully understood, COPD increases your risk of heart disease, including heart attack.

d. Lung cancer. Smokers with chronic bronchitis are at a higher risk of developing lung cancer than are smokers who don’t have chronic bronchitis.

e. Depression. Difficulty breathing can keep you from doing activities that you enjoy. And it can be very difficult to deal with a disease that is progressive and incurable. Talk to your doctor if you feel sad or helpless or think that you may be experiencing depression.

f. Cor Pulmonale – hypertrophy of R side of heart

g. Polycythemia – reddening, increasing RBC’s, putting self at risk for clotting, thick blot, very viscous, at risk for pulmonary emboli – give O2, phores them and remove blood and replace with fluid normal saline

h. The longer and more it progresses, the more you are at risk for

i. Peptic ulcer

j. GERD – hypersecretions of gastric acid from increased arterial pressure

k. Anorexia – don’t want to eat

l. Sleep disturance

7. Given the most common Nursing Diagnoses for the Client with COPD, write the specific nursing implementations for each.

a. Ineffective Airway Clearance R/T increased viscosity of sputum.
   i. Controlled coughing, drinking plenty of water and using a humidifier may help.
   ii. Assess respiratory function, breath sounds and use of accessory muscles
   iii. Position patient in High Fowler’s position
   iv. Document respiratory secretions: character and amount of sputum
   v. Assess/maintain airway patency
   vi. Suction when needed
   vii. Check for obstruction
   viii. Auscultate breath sounds
   ix. Administer medications/bronchodilators
   x. Ambulate
   xi. Turn and reposition
   xii. Effective coughing, huff coughing postural drainage, chest compressions, high fowlers, fluid (3000 ml per day), bronchodilators, mucolytics, expectorants, purse lipped breathing, sometimes opens alveoli, humidified air, air conditioning

b. Ineffective Breathing Pattern R/T air hunger and anxiety
   i. Control your breathing. Talk to your doctor or respiratory therapist about techniques for breathing more efficiently throughout the day. Also be sure to discuss breathing positions and relaxation techniques that you can use when you’re short of breath.
   ii. Purse lipped, no emotional responses, calm attitude, anti-anxiety med (xanax), correct use of O2, exercise, bronchodilators

c. Impaired Gas Exchange R/T air trapping in alveoli
i. O2 therapy, exercise, bronchodilators, enough O2 to maintain PO of 90+, titrate (lower the O2), as their PO increases and see if they can maintain it, smoking cessation, change environment, respiratory therapy am and pm

d. Fatigue (chronic) R/T hypoxia
   i. Exercise regularly. It may seem difficult to exercise when you have trouble breathing, but regular exercise can improve your overall strength and endurance and strengthen your respiratory muscles. – increases rate and depth of respiration, gives strength to thoracic cage, 3 times a week, 15-20 minutes
   ii. Supplemental O2, proper positioning, purse lipped breathing, conserve energy, rest period, start ADL’s in bed, re-establish energy, if on O2, they will need it during ADL’s, if walking or exercising, they will need a chair, walker with a seat, support groups, saline nose drops to decrease post nasal drip – adds to irritation and coughing, use as often as needed, employment – may need vocational rehab, may need re-training or new job

e. Imbalanced Nutrition (less than body requirements R/T anorexia S/T assessments of COPD)
   i. Eat healthy foods. A healthy diet can help you maintain your strength. If you’re underweight, your doctor may recommend nutritional supplements. If you’re overweight, losing weight can significantly help your breathing, especially during times of exertion.
   ii. Allow for rest before meals 30 minutes
   iii. Foods to stimulate appetite, check weight at intervals, auscultate bowel sounds, decongestants to increase smell to increase appetite
   iv. Pre-prepared meals, hard for them to prepare themselves and eat right away, give them any food they like
   v. Increase proteins
   vi. Skim milk – they are more tolerant and provides less mucous production
   vii. Make foods easy to chew and eat (not a tough steak)
   viii. Need teeth and dentures
   ix. Cold foods are less bloating
   x. Avoid gas forming foods, cauliflower, broccoli, cabbage – not enough room in cavity for the bloating
   xi. Pulmicare – a milkshake that is non-bloating
   xii. Exercise 1 hour before or after eating
   xiii. 6 small meals not 3 big ones, less of a stress, hard to breath if you eat to much, bronchodilate before eating, oral care before meals, drugs make the sputum taste funny

f. Knowledge Deficit R/T lifestyle changes S/T COPD
   i. Provide teaching
   ii. Control your breathing. Talk to your doctor or respiratory therapist about techniques for breathing more efficiently throughout the day. Also be sure to discuss breathing positions and relaxation techniques that you can use when you’re short of breath.
   iii. Clear your airways. In COPD, mucus tends to collect in your air passages and can be difficult to clear. Controlled coughing, drinking plenty of water and using a humidifier may help.
iv. Exercise regularly. It may seem difficult to exercise when you have trouble breathing, but regular exercise can improve your overall strength and endurance and strengthen your respiratory muscles.

v. Eat healthy foods. A healthy diet can help you maintain your strength. If you’re underweight, your doctor may recommend nutritional supplements. If you’re overweight, losing weight can significantly help your breathing, especially during times of exertion.

vi. Avoid smoke. In addition to quitting smoking, it’s important to avoid places where others smoke. Secondhand smoke may contribute to further lung damage.

vii. Pay attention to frequent heartburn. Constant heartburn can indicate gastroesophageal reflux disease (GERD), a condition in which stomach acid or, occasionally, bile flows back into your food pipe (esophagus). This constant backwash of acid can aggravate COPD, but treatments for GERD can help. Talk to your doctor if you have frequent heartburn.

viii. See your doctor regularly. Stick to your appointment schedule, even if you’re feeling fine. It’s important to steadily monitor your lung function.

ix. Teach them to sleep in a recliner or in orthopneic position

x. Teach them to report changes – change in color of sputum, nausea, burning, color change in stool, better to call and be safe than to disregard

xi. Immunizations – pneumovac and flu vaccines

xii. Bronchodilations, then steroids, then mucolytics

xiii. Rinse mouth

xiv. Cleanse O2 equipment, white vinegar or soap and water, dishwasher

xv. Sexual activity – have sex when you are breathing best, none right after eating or exercising, non dominant position, no prolonged foreplay, breathing will be different, get to it right away

xvi. Avoid crowds in flu season

xvii. Compression in air plane, must arrange ahead of time and they will provide O2 for you, wear a mask to protect self

• Bronchodilators
• Inhaled steroids
• Antibiotics
• Lung volume reduction surgery
• Lung transplant
• Oxygen therapy
• Pulmonary rehabilitation program

Class – mild, moderate, severe – based on PFS (pulmonary function studies) how much dilation do bronchi have

• Progressive disease that worsens
• Prevent progression of disease
• Increase exercise tolerance
• Prevent treat complications
• Prevent exacerbations
• Improve the quality of life
• Use meds – bronchodilators, xanthenes, theophilines, expectorants, mucolytics, lukotrene modifiers – slow down the process (singulair, oculate, zyflow)
• Surgery – depends on age and other complications
  i. lung transplant, or removal of diseased part, non diseased part can have better expansion
  ii. can they tolerate surgery
  iii.