



THE BASICS OF BREATHING:

Assessment & Treatment Approaches for the Patient with COPD

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LEARNER OBJECTIVES:

- Identify anatomical respiratory landmarks and understand their purpose as they relate to ventilation (mechanical act of breathing) and perfusion (the exchange of oxygen and carbon dioxide)
- Demonstrate understanding of medical assessments which may aid in treatment of the patient with respiratory compromise
- Be able to perform a clinical, objective evaluation which clearly documents functional deficits stemming from respiratory compromise
- Execute treatment interventions to improve both underlying impairments and functional deficits



CHRONIC OBSTRUCTIVE PULMONARY DISEASE



Includes:

- Bronchitis (chronic and acute)
- Emphysema
- Asthma



SYMPTOMS OF COPD:

Underlying Impairments

- Shortness of breath
- Decreased capacity for activity
- Presence of a chronic obstructive cough
- Loss of appetite with possible weight loss
- Increased fatigue

Functional Deficits

- Voice deficits
- Loss of communication
- Swallowing issues, including aspiration pneumonia



HOW DOES THIS AFFECT THE SLP?

“The presence of COPD was shown to be the most significant risk factor for aspiration pneumonia in nursing home patients.”

Gross et al, 2009



HOW CAN THE SLP HELP?

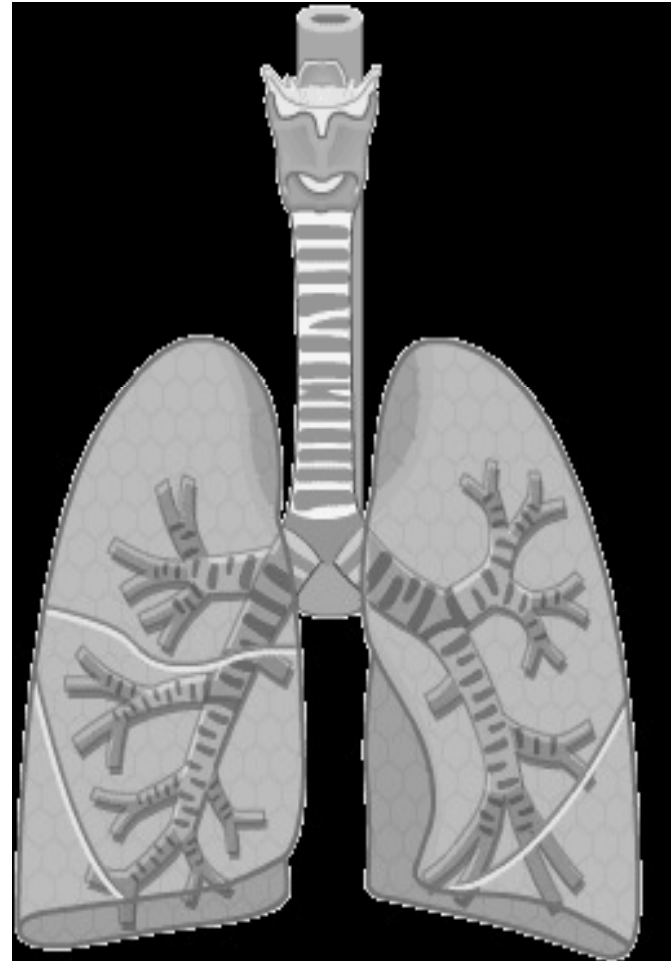
- Studies have shown that pulmonary rehabilitation programs ARE effective in the management of COPD symptoms
- Moreover...they can increase the quality of life for the patients

Norweg et al, 2005, and Stallard, 2007

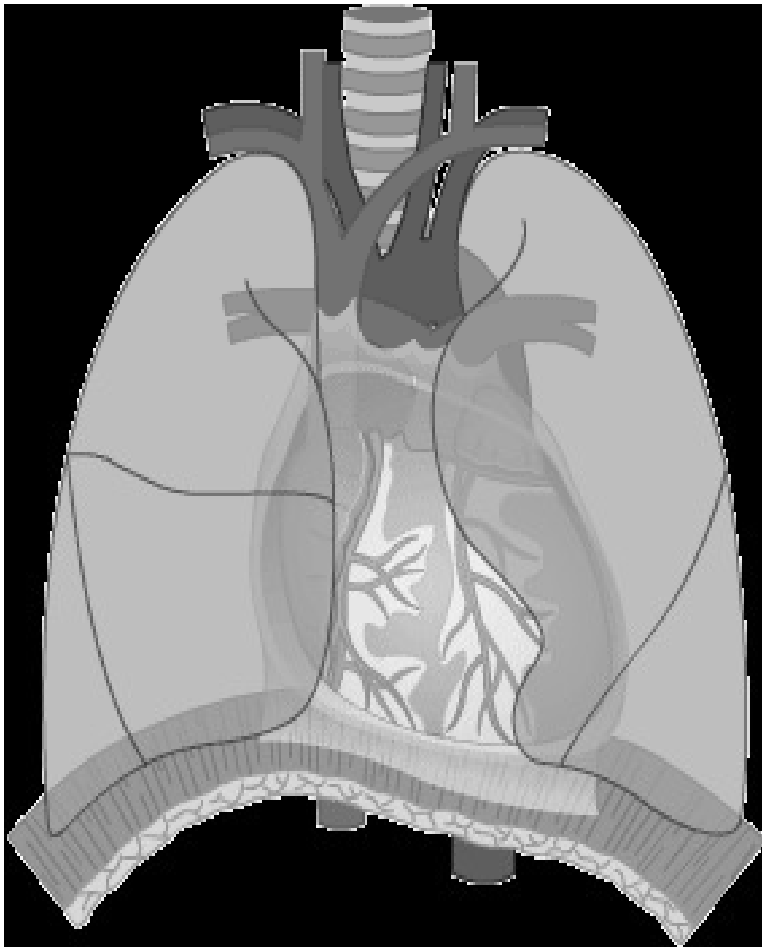


ANATOMY & PHYSIOLOGY OF THE RESPIRATORY SYSTEM: TRACHEA & BRONCHI

- Runs anterior to the esophagus
- Conducts air between the larynx and primary bronchi
- Made up of cartilage rings to keep airway open
- Primary bronchi branch into left and right lungs, then branch off into secondary & tertiary



ANATOMY & PHYSIOLOGY: THE LUNGS

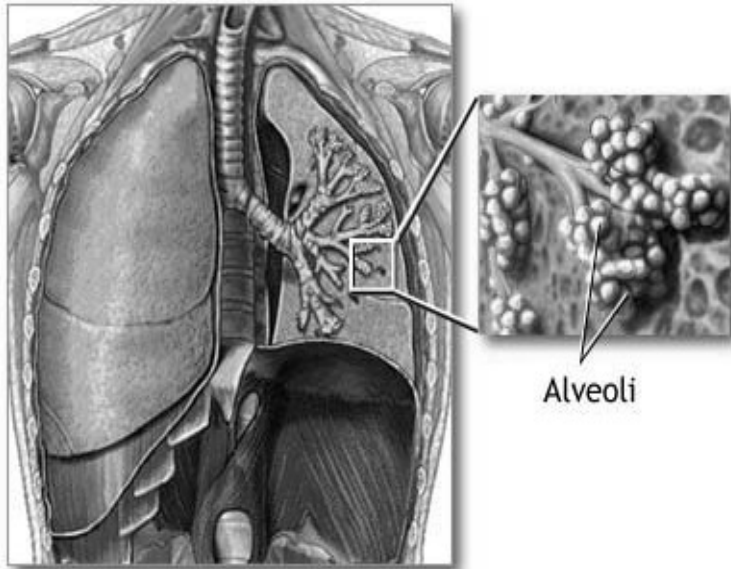


The lungs:

- 3 lobes on right; 2 on left
- Most of the tissue consists of branching tubes: the bronchi, bronchioles, and alveolar ducts



ANATOMY & PHYSIOLOGY: THE ALVEOLI



Younger lungs

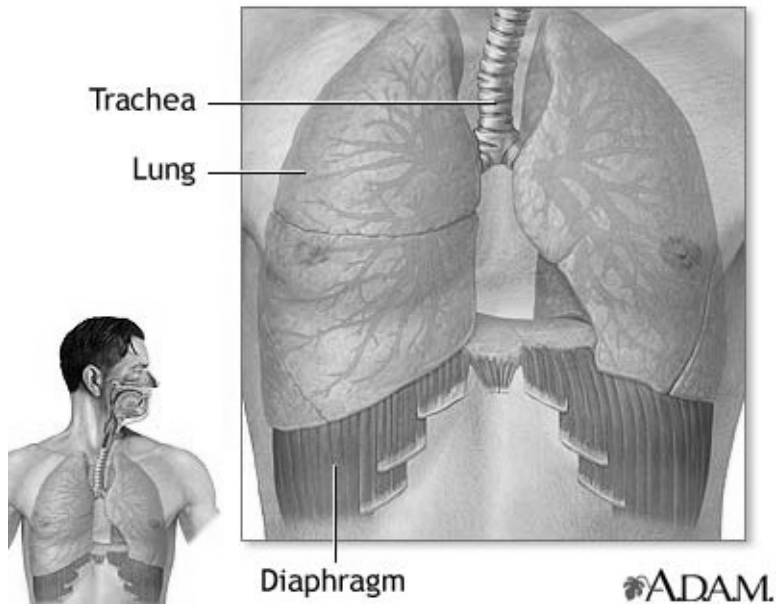
Alveoli

ADAM.

- Alveoli inside each alveolar duct are arranged in grapelike sacs
- O₂/CO₂ exchange occurs here, within the alveolar capillaries



ANATOMY & PHYSIOLOGY: THE DIAPHRAGM



- Muscle largely responsible for active inhalation
- Contraction occurs during inhalation and pulls the diaphragm down
- Targeted area for breathing retraining



THINGS TO KNOW BEFORE THE EVALUATION

- Helpful to be able to take and/or interpret vital signs (respiratory rate, pulse, blood pressure)
- Thoracic auscultation is not just for nurses!
 - Documentation of auscultation should include breath sounds with the appropriate lobe
 - Follow a zig-zag pattern anteriorly and posteriorly, extending laterally toward bases of the lungs (avoid bony prominences and breast tissue)
 - Breath sound descriptions include: normal, decreased, absent, rales (fine, medium, coarse), rhonchi, or wheeze
 - www.med.ucla.edu/wilkes/index.htm



THINGS TO KNOW BEFORE THE EVALUATION: CLINICAL CONSIDERATIONS

- Ensure proper positioning of the patient: cannot lie flat without dyspnea
- Avoid Valsalva-like maneuvers: possible strain and cardiac implications
- Learn the signs of respiratory muscle fatigue:
 - Rapid, shallow respirations
 - Uncoordinated chest wall movement
 - Increased accessory muscle movement
 - Dyspnea



THINGS TO KNOW BEFORE THE EVALUATION: CLINICAL CONSIDERATIONS

- Recognize the psychological implications of COPD
- The inability to breathe will trump any other concern and could result in therapy refusals



BEGINNING THE EVALUATION: CHART REVIEW

- Review etiology of the illness
- Review past and current courses of treatment, including medical management of COPD
- Look for use of supplemental oxygen
- Use pulseoximetry to measure oxygen levels in the blood, review chart to find current levels (levels should be above 90-93%)
- Review diagnostic tests such as: ABG (arterial blood gas), CBC (complete blood count), ventilation perfusion scan, EKG, PFT (pulmonary function tests), and chest x-rays



THE EVALUATION

- Use general evaluation procedures (formalized testing, BSE, etc)
- Assess cognition
- Assess the following: MPT, s/z ratio, phrase length during connected speech or conversation, vocal quality, coordination of respiration and swallowing, meal endurance
- Observe physical appearance for: cyanosis, clubbing, lower extremity edema, abnormal posture (i.e., kyphosis)
- Consult with OT to discuss limitations with ADLs or use of AE, if any



THE EVALUATION: PLAN OF CARE

- POC needs to be concise, measurable, objective, and medically necessary
- Identify target outcome measures:
 - Improvement of breathing function
 - Improvement of cough strength to independently clear and protect airways
 - Restoration of adequate vocal quality
 - Improvement in MPT and phrase length for speech
 - Improvement in swallowing safety as a result of increased coordination of respiration and swallowing
 - Improvement in vocal hygiene



THE EVALUATION: PLAN OF CARE

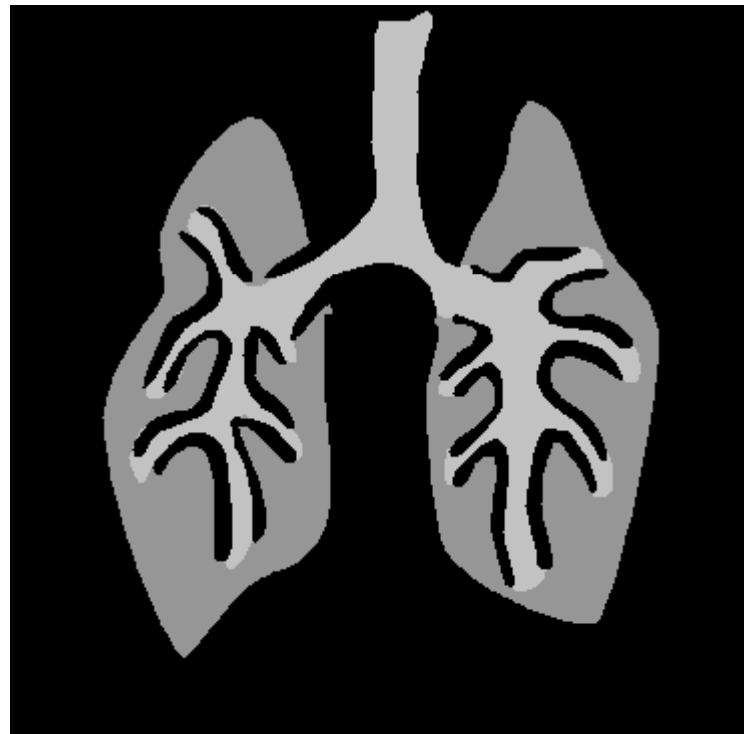
Additionally, it is possible to increase endurance levels by increasing the amount of oxygen being respired (inhaled and exhaled) and infused into the bloodstream.

Cigna, 2005



TREATMENT

- Pursed lip breathing
- Diaphragmatic breathing
 - Incentive spirometry
 - Progressive resistive exercises
- Assisted cough techniques



PURSED LIP BREATHING

- Helps the patient to control his/her breathing rate
- Holds airways open during exhalation, reducing CO₂ retention
- To perform: have the patient inhale through the nose for 2 counts, then exhale gently through pursed lips for 3-4 counts—preferably without utilizing the abdominal muscles.
- “Smell the roses, blow out the candle”



DIAPHRAGMATIC BREATHING

- Teaches the patient not to rely on accessory muscles for breathing
- Teaches self-monitoring of muscle use during respiration and speech
- Can have a greater impact on vocal intensity, breath support, and cough strength
- Most easily taught with the patient in semi-Fowler's position (reclined)
- Begin with clinician-facilitated diaphragmatic breathing: gives verbal, visual, and tactile cueing for multi-modal learning



DIAPHRAGMATIC BREATHING

- Once patient is reclined, SLP should place one hand over the patient's abdominal area ("stomach") while instructing the patient breathe in through the nose into the SLP's hand
- Instruct patient to exhale normally. SLP may give a small "push" to facilitate the next diaphragmatic breath
- Continue this technique until the patient can demonstrate greater ability to distinguish diaphragmatic movement during breathing



DIAPHRAGMATIC BREATHING

For patient-directed breathing exercises:

- have the patient place one hand on the chest and the other on the stomach.

Once a patient is able to effectively perform diaphragmatic breathing, challenge the inspiratory muscles by introducing strengthening activities

- Incentive spirometry
- Commercially available breathing exercisers
- Ankle weights



ASSISTED COUGH TECHNIQUES

- Useful for patients with either dysphagia or voice deficits
- May use either the controlled cough or manual cough assist
- Assisted cough techniques are very effective for those patients who have difficulty adequately protecting the airway during swallowing, and can also be used for patients who have a greater amount of secretions which affect voicing and ultimately, communication.



ASSISTED COUGH TECHNIQUES

Controlled cough:

- cue the patient to take a deep breath through the nose, then cough twice on the same breath

Manual cough assist:

- SLP positions hands on the patient's abdominals, just under the ribcage
- The patient is then cued to take a breath and cough while the clinician provides physical assistance (moving up and in with the hands) to help stimulate muscle contraction for the cough.



SAMPLE TREATMENT GOALS:

- Patient will increase maximum phonation time to 15-20 seconds in order to improve breath support for speech at the conversational level.
- Patient will utilize diaphragmatic breathing in order to improve coordination of respiration and swallowing for safe intake of regular diet and thin liquids 90% of the time.
- Patient will use adequate cough strength in 90% of opportunities in order to facilitate secretion mobilization and airway protection.
- Patient will independently utilize compensatory strategies for speech intelligibility and vocal intensity in order to make known wants, needs, thoughts, and feelings 100% of the time.



INTERDISCIPLINARY TEAMWORK

- SLP can assist other disciplines to promote achievement of therapy goals and improve overall function of the patient
- SLP can learn techniques which are typically taught to other disciplines, which may benefit the SLP's treatment (i.e., postural drainage techniques, percussion/vibration)
- Boosts patient performance, as well as promotes overall feeling of camaraderie and mutual respect



CONCLUSION:

- This list of interventions and exercises is not exhaustive, but meant to stimulate interest in this growing patient population
- New research is being completed at an astounding rate, as more and more patients are in need of services due to this condition.
- Therefore, how to effectively assess and treat this condition has become imperative in a speech-language pathologist's repertoire.



QUESTIONS?



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Pulmonary A&P information/graphics from:

- <http://www.getbodysmart.com/ap/respiratorysystem/menu/menu.html>
- <http://www.nlm.nih.gov/medlineplus/ency/images/ency/fullsize/19380.jpg>



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