Preconference Form

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Medical Diagnosis/Disease: COPD

NCLEX IV *(8)*: Physiological Integrity/Physiological Adaptation

NCLEX IV *(7)*: Reduction of Risk

Anatomy and Physiology

Normal Structures

The upper respiratory tract includes the nose, mouth, pharynx, epiglottis, larynx, and trachea.

nose is where the air is primarily entering and is made up of bone and cartilage. It is separated into 2 nares by the nasal septum. The inside of the nose is divided into 3 passages by the turbinate's that increase the surface area of the nasal mucosa that warm and moisten the air as it enters. The nose also filters small particles before the air enters the lungs. The internal nose directly connects to the sinuses and the nasal cavity connects directly to the pharynx.

The **pharynx** is a tubular passageway that is subdivided into three parts called the nasopharynx, oropharynx and the laryngopharynx. Air moves through the oropharynx to the laryngopharynx and then travels through the epiglottis to the larynx before moving to the trachea. (the epiglottis is the small flap that closes off when swallowing to prevent food or liquid from entering).

Air passes through the vocal cords to the **trachea** which the trachea is about 5 inches long and 1 inch in diameter. U shaped cartilages keep the trachea open but allow the adjacent esophagus to expand for swallowing. The trachea divides into the right and left main stem bronchi at the point called the **carina** which is located at the level of the 4th and 5th thoracic vertebrae.

The lower respiratory tract consists of the bronchi, bronchioles, alveolar ducts, and alveoli. Expect for the right and left bronchi all the lower airway structures are found in the lungs.

The **right lung** is divided into three lobes (upper middle and lower) while the **left lung** is divided into 2 lobes (upper and lower).

The **mainstem bronchi** subdivide several times to form the lobar, segmental, and subsegmental bronchi.

Further divisions from the **bronchioles**. The most distant bronchioles are the respiratory

Pathophysiology of Disease

COPD is associated with an enhanced chronic inflammatory response in the airways and in the lungs. The inflammation occurs in the bronchioles, alveoli and the blood vessels. The main cause is smoking and noxious particles and gases. COPD is not fully reversible during forced exhalation, the main cause is the loss of elastic recoil and airflow obstruction, from mucus hypersecretion, mucosal edema, and bronchospasm. As the disease progresses abnormalities in airflow limitation, air trapping, and gas exchange worsen. Chronic inflammation causes tissue destruction and disrupts the normal defense mechanisms and repair process of the lung.

The predominant inflammatory cells in COPD are neutrophils, macrophages, and lymphocytes.

Inability to exhale air is the main characteristic of COPD, it primarily affects the smaller airways. As air gets trapped in the chest it hyper-expands and becomes barrel shaped because the respiratory muscles cannot function effectively.

Hypoxemia at rest does not normally occur until later in the disease but hypoxemia while exercising can occur earlier on and cause a need for O2.

Bullae and blebs can form and are not effective in gas exchange.

V/Q mismatch and hypoxemia result.

Can be classified as mild, moderate, severe, or very severe. The severity of the obstruction determines the stage.

Anticipated Diagnostics

Labs

ABGs

WBCs

Blood cultures

Sputum cultures

Additional Diagnostics

H&P

CXR

COPD assessment test

Spirometry

6-min walk test

bronchioles which constrict and dilate in response to stimuli.
Bronchoconstriction and **bronchodilation** refer to decrease or increase in the diameter of the airways caused by contraction or relaxation of these muscles.
The **alveoli** are the final part, and they are small sacs in the lungs that are the primary site of gas exchange. The adult lung has over 300 million each being 0.3mm in diameter. The alveoli are connected by pores known as **Kohn** which allow movement from alveolus to alveolus, and this is also what causes the spread of infection between them.
Pulmonary circulation is the system of blood vessels that move blood between the heart and lungs. Pulmonary artery is delivering the blood to the lungs and the pulmonary vein delivers from the lungs.
Respiratory defenses:
Air filtration is how the nasal hairs in the nose keep particles from entering the air ways
Mucociliary clearance system: this is the system that clears mucous from the larynx by cilia covering the airways and helping to push it back up and keep it out of the lungs
Cough reflex: coughs are used as a high-pressure high velocity flow of air as a backup for mucus clearing. Coughing is effective for removing secretions
Reflex bronchoconstriction: when we inhale large amounts of irritants that the bronchi will constrict to prevent entry into lungs
Alveolar macrophages: rapid removal of things like bacteria up to the bronchioles for removal

NCLEX II *(3)*: **Health Promotion and Maintenance**

Contributing Risk Factors	Signs and Symptoms
Cigarette smoking infection asthma air pollution aging genetics	Dyspnea Chronic cough Sputum production History of exposure to risk factors Chest heaviness Unable to get a good breath

NCLEX IV *(7)*: **Reduction of Risk**

Possible Therapeutic Procedures	Prevention of Complications
Non-surgical Immunizations Oxygen Thoracentesis Chest tube Surgical Lung volume reduction Bullectomy Lung transplant	(What are some potential complications associated with this disease process) Decreased breath sounds Wheezing Hypoxemia Cyanosis hypercapnia pulmonary hypertension

NCLEX IV *(6)*: Pharmacological and Parenteral Therapies

Anticipated Medication Management
Short acting B-2 agonist
Long-acting B-2 agonist
Long-acting muscarinic
Symptom relief medications
Inhalers and nebulizers
O2

NCLEX IV *(5)*: Basic Care and Comfort

Non-Pharmacologic Care Measures
Quit smoking
Hydration
Pulmonary rehab
Exercise plans
Nutrition treatment

NCLEX III *(4)*: Psychosocial/Holistic Care Needs

What stressors might a patient with this diagnosis be experiencing?
Anxiety from not being able to breath properly
Financial
Spiritual
Surgery
Progression of disease

Client/Family Education

List 3 potential teaching topics/areas
• the importance to limit exposure to smoking and carcinogens

• how to use O2 at home and the importance of it

• how to effectively breathe and use techniques to help expel air

NCLEX I *(1)*: Safe and Effective Care Environment

Multidisciplinary Team Involvement
(Which other disciplines do you expect to share in the care of this patient)

Nurse, doctor, surgeon, pulmonologist, clergy, dietitian, case manager