

## **Science Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments**

**CLE: 4.1 Organisms are interdependent with one another and their environment.**

**Health Profession: Respiratory Therapist**

**Name: Erin Stauffer; MWSU Senior Nursing Student**

**Contributors: Respiratory Therapists: Don Henke and Terry Brosemer**

### **References:**

**University of Virginia Health System, (2004) Asthma, page1, Patrick Brown, <http://www.healthsystem.virginia.edu/internet/pediatrics/patients/Tutorials/Asthma/whydoes.cfm>**

**Hockenberry, M.; Wilson, D. (2007) Nursing Care of Infants and Children, 8<sup>th</sup> ed, page 1355-1359, Missouri, MosbyElsevier**

**Karch, A; (2006) Focus on Nursing Pharmacology, third edition, 856 and 858, Lippincott Williams & Wilkins**

### **Objectives:**

**At the completion of this presentation the high school student will be able to:**

- 1. Explain how the natural environmental event (forest fire, flood, volcanic eruption, avalanche) may have an effect on the health of an individual.**
- 2. Demonstrate the concept of environmental factors that effect humans by setting up an experiment and/ or an activity**
- 3. Identify the importance of this to Respiratory Therapy**

### **Background Summary of Information as related to Respiratory Therapist and CLE:**

**Scenario: In the below scenario, Luke is experiencing a relatively severe hacking, irritated, non productive cough. Asthma attacks can occur from outdoor and indoor allergens, along with emotions and exercise. Since Luke is helping clean up the aftermath of hurricane Katrina, the physician should include Luke's recent activities that could have led to his severe cough, such as his new living environment, working with dirty, moldy houses; and strong cleaning odors.**

**Luke is experiencing all the signs of an asthma attack such as a hacking, irritated, non productive cough. He is also experiencing a headache because the lack of oxygen circulating in the blood stream. Loss of oxygen in the blood stream happens because Luke is having trouble catching his breathe.**

**During an asthma attack, a patient will exhibit inflammation in their airways. The inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough particularly at night and early morning. All these episodes are due to mucus accumulating. Asthma attacks usually begin with increased restless accompanied by cough producing frothy, clear, gelatinous sputum.**

**A common symptom of asthma is coughing in the absence of respiratory infection. All of these are important factors in diagnosing asthma.**

**Before leaving Luke, Dr. McDreamy must explain to him what asthma is and give him examples of asthma irritants.**

**Irritants include indoor and outdoor allergies, chemicals, changes in weather temperature, weight, smoke, emotions and exercise.**

**Scenario:**

**Luke, an 18- year old male, was doing physical labor to help clean the aftermath of hurricane Katrina. He suddenly experiences a tightening in the chest; restrictive, shallow breathing; coughing and can not catch his breath. Luke signals to his co-workers that he can't breathe, they then call 911. Upon arriving to the nearest hospital, Dr. McDreamy, the pulmonologist, must assess his condition STAT! Luke is uncomfortable, increasing restless, complains of feeling tired and tightness in his chest.**

**What is your first response as to what could be wrong? Explain why.**

**\* There are many conditions that mimic asthma, enlarged lymph nodes, vocal cord paralysis, and acute inflammation in the airways. So it is very important to do a complete assessment, run test and do x-rays.**

**What kinds of testing would you order?**

**\* We would first ask the patient about history, physical exam, labs tests, and x-ray to rule out any other diseases.**

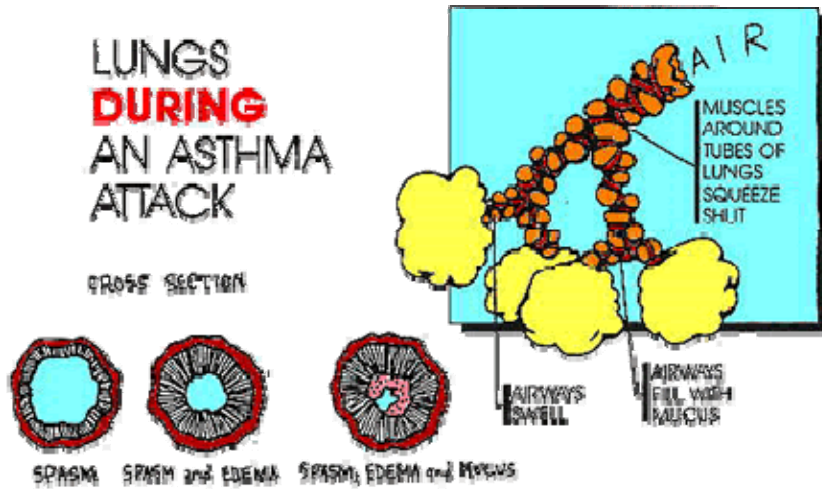
**What further information from this patient might be beneficial to accurately diagnose this patient?**

**\* Other beneficial information from the patient includes history and physical, family history, work and living environment, what medication they are on, their exercise routine, emotions they are experiencing, and food allergies.**

**As a Respiratory Therapist, teaching your patients about his/her condition is imperative. How would you explain to Luke what physically happens to the body with respiratory problems and what would you teach as preventative measures for the future?**

**\*Asthma is the inflammation of the airway (bronchioles) that secrete mucus, have bronchospasm, and increased secretion production. This causes the airways to narrow and air being trapped, this occludes the bronchi.**

This is why you feel short of breath.



**Treatment:**

**AeroBid:** inhaled steroid, decreases inflammation of the airway, this will increase air flow making it easier to breath.

**Accolate:** blocks air way inflammation, prevention and long-term of asthma

**Activities:**

Give the class coffee straws and have them do jumping jacks or run in place. Then evaluate how well they are able to breath through the straw.

Have an empty 2 litter pop bottle, and a deflated balloon. Put the balloon on the 2 litter and squeeze the bottle. This represents how the lungs work.

**Supplies needed:**

- Coffee straws
- Balloons
- 2 liter pop bottle

**Respiratory Schools in Missouri:** - University of Missouri (MU)- Columbia  
- Missouri Southern State University- Joplin  
- Sanford- Brown College- Fenton & Hazelwood  
- Missouri State University- Springfield  
- Concorde Career Colleges- Kansas City

- Ozarks Technical Community College

## **Requirements**

- 1. Completion of general course prerequisites**
- 2. Completed application packet submitted to admissions committee**
- 3. Minimum of 2.5 cumulative GPA**
- 4. Evidence of interest and knowledge of the field**
- 5. Volunteer or observation experiences**
- 6. Two letters of recommendation**
- 7. Personal interview**