

## **Asbestosis and Mesothelioma**

### **Lesson preparation and task:**

- **Research the topics for the lesson**
  - **Prepare a review of the topics**
- **Prepare a post test for the material learned**
- **Prepare the review for the computer based FTO CE**

### **Equipment needed:**

- **Station computer with internet access**
  - **CE answer sheet**

### **Lesson objectives:**

**At the end of this lesson, the student should be able to:**

- **Recognize the difference between Asbestosis and Mesothelioma.**
- **Recognize the signs and symptoms of both disease processes.**
- **Understand the reason for a thorough assessment of all respiratory distress patients.**
- **Understand the proper protocol to follow for patients with these conditions.**

# **ASBESTOSIS and MESOTHELIOMA**

## **Written by Lynn Wallis**

As time goes on we tend to find more and more items that we were exposed to in previous years that can cause problems later in life. One exposure that is having an increase in occurrence is asbestos.

Asbestos is the common name for any variety of silicate materials that are fibrous in structure and are more resistant to acid and fire than other materials. It has two forms, serpentine and amphibole, and is made of impure magnesium silicate. There are more than 3,000 products in use today that contain asbestos. Most of these are materials that are used in heat and acoustic insulation, fireproofing, and roofing and flooring. Some of the more common products that can contain asbestosis include:

- Pipe and duct insulation.
- Building insulation.
- Wall and ceiling panels.
- Carpet underlay.
- Roofing materials.
- Artificial fireplaces and materials.
- Patching and spackling compounds.
- Brake pads and linings.
- Pot holders and ironing board pads.
- Hairdryers.
- Floor tiles.
- Electrical wires.
- Textured paints.
- Cements.
- Toasters and other household appliances.
- Furnaces and other furnace door gaskets.

Both forms of asbestos exhibit physical and chemical resistance to high temperatures and applied force. The raw ore of both forms is made up of fibrous strands. The strands then continue to split into smaller and thinner fibers as disturbance continues and increases. Asbestos ore forms will initially divide into visible strands, fiber bundles, and individual fibers. But then those visible strands, bundles, and fibers will continue to split into microscopic strands, bundles, and fibers. The splitting can continue on to minute levels of microscopic detection. This process is unique to asbestos and is why airborne asbestos is such a problem. The fibers can become so small that they remain airborne longer and pass by the respiratory dust defenses.

Some uses of asbestos have been banned: the spraying of asbestos-containing materials (1973); certain pipe coverings (1975); certain patching compounds and artificial fireplace logs (1977); spray-on asbestos decorations (1978); and asbestos containing hairdryers (1979). The production of all asbestos-containing materials for home construction and use was banned, in three stages over seven years, beginning in 1990. Products containing asbestos are often not labeled as such. Contact the manufacturer to find out if asbestos is present. Or call the U. S. Consumer Product Safety Commission (800-638-2772) for information about whether a product contains asbestos.

Asbestos fibers can have serious effects on your health if inhaled. The amount of time between exposure to asbestos and the first sign of disease can be as much as 30 years. It is known that smokers that are exposed to asbestos have a much greater risk of developing lung cancer than for smoking alone.

Exposure to asbestos can cause **asbestosis**, which is a scarring of the lung tissue that leads to possible breathing problems and heart failure. Inhalation of asbestos can also lead to lung cancer and **mesothelioma**. This is a rare cancer of the lining of the chest and abdominal lining.

**Asbestosis** is caused by the inhalation of asbestos fibers. It is not cancer. The disease process of asbestosis is not fully understood. It appears that asbestos fibers in the lungs cause irritation and inflammation. The body tries to neutralize these fibers in various ways, and this leads to further inflammation and cell damage. A fibrosis or scar tissue develops in the area around the small airways and air sacs. The thickening

and scarring prevents oxygen and carbon dioxide from traveling between the air sacs and the blood cells, thus breathing becomes less efficient.

Asbestosis can exist without any symptoms. Symptoms can include shortness of breath and coughing. As the disease progresses, the symptoms may worsen.

Diagnosis can be made using the past history of asbestos exposure, chest x-ray, CT scan, and pulmonary function test (PFT's)

There is no cure for asbestosis. Presently steroids can be used in an attempt to treat inflammation. It is also possible that the patient's physician will recommend that persons diagnosed with asbestosis stop smoking, stay current with their vaccinations to include the flu and pneumonia vaccinations, and be aware of the possibility of pulmonary hypertension and the possibility of blood clots due to decreased blood flow. In the most severe cases, there are lung and heart and lung transplants.

Asbestosis increases the risk of the development of lung cancer 5 fold; however, if a smoker has asbestosis, the risk is increased 92 fold.

**Mesothelioma** is a cancer that attacks mesothelium and is most commonly found in the lungs. Mesothelioma is rare or nonexistent in non-asbestos exposed populations but is becoming more common among asbestos-exposed individuals. In the United States there is no other known proven cause of mesothelioma other than asbestos exposure. Unlike other forms of lung cancer, mesothelioma is a cancer of the lining of the lungs and not a cancer that occurs inside the lungs. Mesothelioma causes the cells of the mesothelium to become abnormal and infinitely reproduce.

A normal mesothelium cell (or any cell for that matter) can only reproduce a certain number of times. This keeps certain cells from invading other cells. Cancer occurs when those cells become mutated and their limits are removed, allowing them to reproduce uncontrollably.

Mesothelial cells line the chest cavity, the abdominal cavity, and the cavity around the heart. They also cover the outer surface of most organs. The tissue that is formed by these mesothelial cells is called mesothelium. Mesothelium helps the organs by producing a lubricating fluid that lets the organs move around. This makes it easier for the lungs to expand and move around inside the chest during respirations.

The mesothelium in the chest is called the pleura and in the abdomen it is the peritoneum.

Signs and symptoms of mesothelioma include:

Pleural:

- Chest pain and pain in the lower back.
- Difficulty breathing.
- Coughing.
- Weight loss.
- Fever.
- Muscle weakness and sensory loss.
- Swelling of the face and arms.
- Hoarseness.
- Coughing up blood.

Peritoneal:

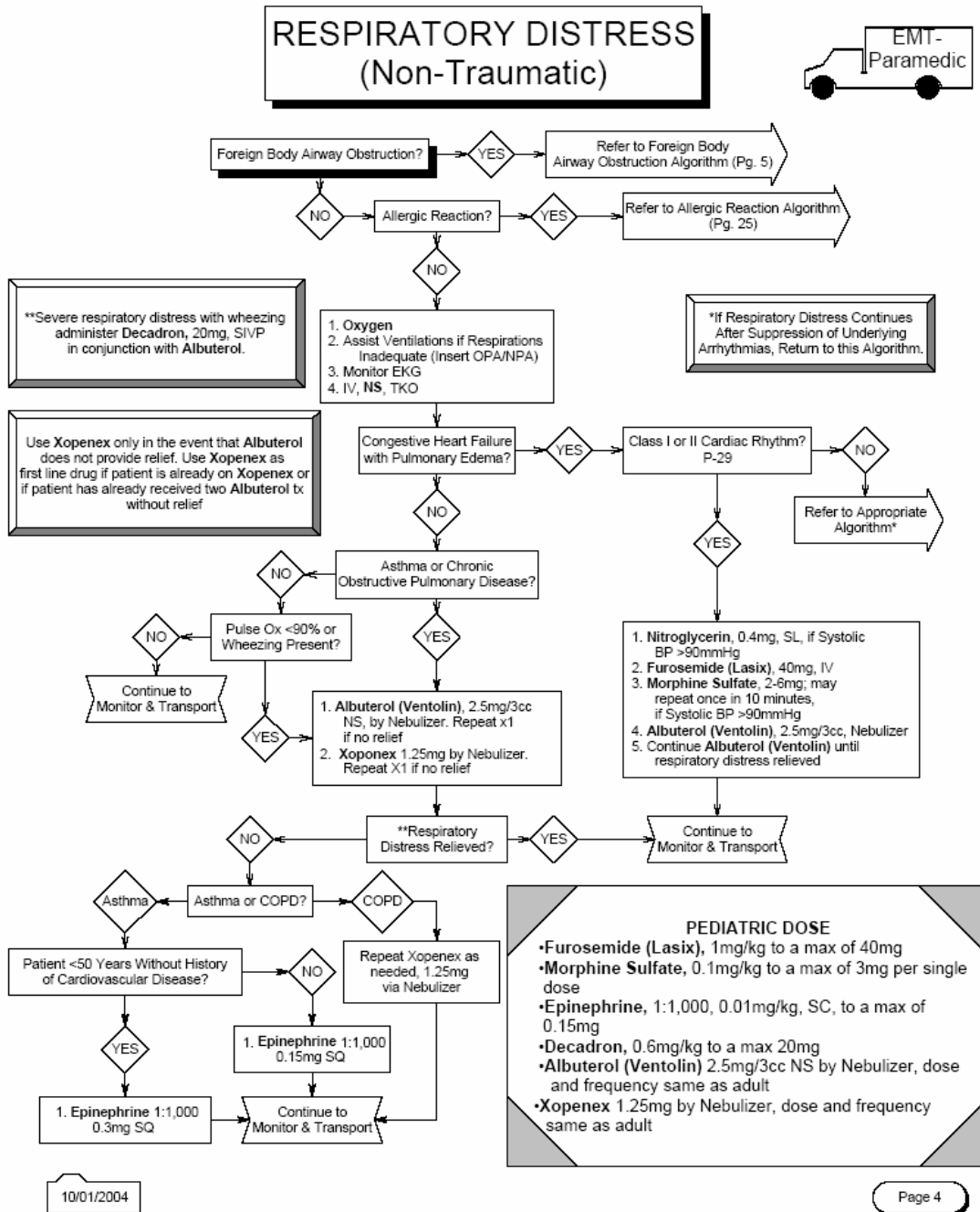
- Abdominal bloating due to fluid accumulation in the abdominal cavity.
- Nausea and vomiting.
- Swelling of the feet.
- Fever.
- Impaired bowel function.

Patients with more advanced disease may be generally ill with fever, night sweats, and weight loss. Involvement of the pericardium may cause heart rhythm disturbances.

Many of the above signs and symptoms can be confused with other medical illnesses such as congestive heart failure, cirrhosis of the liver, tuberculosis, hypertension, other cancers, and many other generalized illnesses, therefore, a thorough assessment of past asbestos exposure is critical. (Remember, all patients with coughing of blood or persistent cough for several weeks should be treated as a possible tuberculosis patient and a mask should be placed on the patient to prevent additional exposure to you, your partner, or hospital staff.)

There is the possibility that the patient may have not been diagnosed with asbestosis or mesothelioma. Make sure that you treat the signs and symptoms. As with

any respiratory complaint, treatment of asbestosis and pleural mesothelioma should follow the respiratory distress protocol:



Although there is no difference in the treatment of these respiratory diseases it is important to be able to differentiate the differences between the two. It is also important to understand the methods of exposure and what items contain asbestos. Because EMS crews are exposed to all different types of environments and in all types of conditions, it is necessary to be aware of your surroundings and the possibility of items containing asbestos. This will help prevent unnecessary exposure to yourself or your patient.

Asbestosis from the American lung association, <http://www.cheshire-med.com/programs/pulrehab/asbestosis.html>

Pulmonary – Critical Care Associates of East Texas, <http://pcca.net/Asbestosis.html>

Asbestosis – MayoClinic.com, <http://www.mayoclinic.com/health/asbestosis/DS00482/si=2765>

eMedicine – Asbestosis: Article by Basil Varkey, MD, FRCPC, FCCP, <http://www.emedicne.com/med/topic171.htm>

Asbestosis Resource Center: General Information, <http://asbestosresource.com/asbestos/>

Vsearchmedia - asbestosis information, <http://www.vsearchmedia.com/asbestosis.html>