



THE UNIVERSITY OF ALABAMA®

WHERE LEGENDS ARE MADE

# ASBESTOS AWARENESS

INITIAL TRAINING 2018



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# Asbestos Awareness

- This course will provide you with information about serious health hazards associated with exposure to asbestos.
- It will also address where asbestos is commonly found, how it can potentially affect you and what you need to do to protect yourself and others from exposure.



# Awareness Training Requirements

- The Occupational Safety and Health Administration (OSHA) requires that employees who work or perform housekeeping operations in an area containing asbestos-containing materials (ACM) or presumed asbestos-containing materials (PACM) receive awareness training at least once a year.



# Learning Objectives

Upon successful completion of this course, you will be able to

- Define terms associated with asbestos
- Identify where asbestos-containing materials are commonly found
- List the requirements for signs and labels
- Identify illnesses related to asbestos exposure
- Define general guidelines of the medical surveillance program required by OSHA, and
- Identify safety measures that protect against exposure



# Asbestos – What? When? & Why?

- Asbestos is a naturally occurring class of minerals mined from the earth.
- It is readily available, very strong, does not burn, conducts heat and electricity poorly and is chemically almost indestructible.



# Asbestos – What? When? & Why?

- The fibers are silky in texture and a variety of products can be easily made using asbestos.
- Asbestos was widely used beginning and following World War II.



# Asbestos – What? When? & Why?

- Asbestos was originally thought of as a wonder product because of its unique properties, availability and low cost.
  - Fire resistant
  - High tensile strength
  - Poor conductor of heat and electricity
  - Some chemical resistance
- In parts of the world asbestos is still used today.





# Asbestos – What? When? & Why?

- The use of asbestos in the United States did not decline until the 1970s.



# Types of Asbestos



Crocidolite (Blue Asbestos)

- There are six major types of asbestos. These are
  - Chrysotile
  - Amosite
  - Crocidolite
  - Tremolite
  - Actinolite
  - Anthrophyllite

# Types of Asbestos

- Each type of asbestos has different characteristics.
  - Chrysotile is by far the most common. Almost 95% of all asbestos is chrysotile. It is long white wavy bundles of hollow fibers.
  - Amosite is a tan or brownish color and very rigid. It is not hollow therefore it is difficult to wet which is a key element of abatement.
  - Crocidolite is a blue color. It was normally used in high temperature applications.
  - The remaining three are rarely found.

# Background History

- The Environmental Protection Agency, commonly referred to as the EPA, is responsible for developing and enforcing regulations necessary to protect the general public from exposure to airborne contaminants.
- Inhaling asbestos fibers is extremely dangerous and may lead to increased risk of developing one or more diseases.
- The EPA governs the removal and disposal of asbestos.
- Additionally provisions allow states to establish their own regulatory programs which exceed the EPA's requirements in the area of abatement work practices and notification procedures, and transportation and disposal of asbestos-contaminated waste.



# Background History

- EPA regulations include
  - ASHARA (Asbestos School Hazard Abatement Reauthorization Act)
  - NESHAP (National Emission Standards for Hazardous Air Pollutants)
  - AHERA (Asbestos Hazard Emergency Response Act)
- EPA's Ban and Phase-Out Rule bans the use of certain asbestos-containing products including corrugated paper, roll board, commercial paper, specialty paper, flooring felt, and new uses of asbestos



# Background History

- The Occupational Safety and Health Administration (OSHA)
  - Requires asbestos, like other hazardous materials, to have a warning label
    - This includes all products containing asbestos and all containers of asbestos or asbestos waste material
  - Many asbestos products also have material safety data sheets



# Background History

- According to the EPA...
  - “The mere presence of asbestos in a building does not mean the health of the building occupants is endangered.”
  - However asbestos can deteriorate with age and may become unstable
    - If an asbestos containing material is dry, loose and crumbles in the hand, it can be considered hazardous to your health
    - If asbestos containing materials are disturbed, asbestos fibers can become airborne

# Common Terms



Terms to describe whether something is or may contain asbestos, and if so, its characteristics:

- Asbestos-containing material (ACM): any material containing more than 1% asbestos
- Presumed asbestos-containing material (PACM): thermal system insulation and surfacing material found in buildings constructed no later than 1980



# Common Terms

Asbestos containing material (ACM) is described in two ways:

- Friable ACM: any material containing more than 1% asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure
- Non-friable ACM: a material in a building containing more than 1% asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.



# Common Terms

Additional terms:

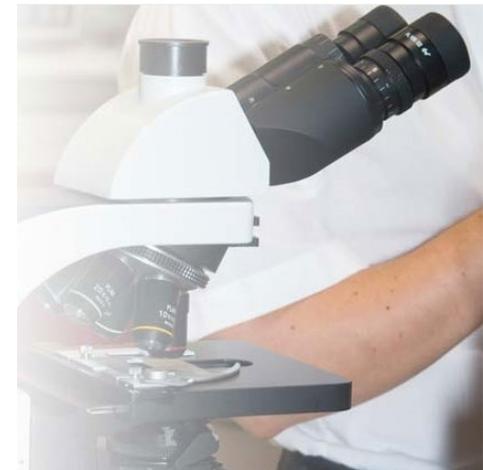
- Regulated area: a clearly defined and identified area established by the employer where airborne concentrations of asbestos exceed, or a reasonable possibility exists that they may exceed, the permissible exposure limit (PEL 0.1 f/cc of air)



# Role of Environmental Health & Safety (EHS) in Locating ACM & PACM

While it is often possible to suspect that a material or product contains asbestos by visual determination, actual determinations can only be made by instrumental analysis

- EPA requires instrumental analysis of suspect materials collected as bulk samples
  - Polarized light microscopy (PLM), determines
    - Type of asbestos in the bulk samples
    - Percentage of asbestos in the bulk material
- EHS provides this service to campus
- EHS maintains a list of all locations inspected/tested and the results



# Role of Environmental Health & Safety (EHS)



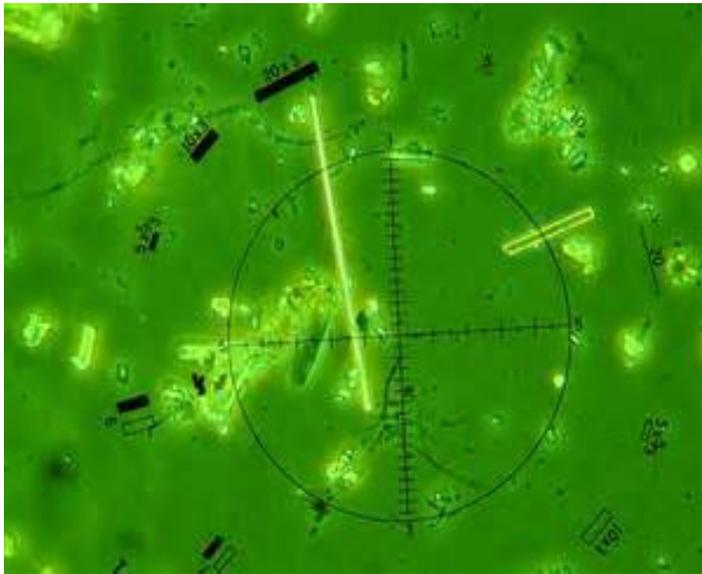
- EHS is responsible for conducting **building surveys** for asbestos, lead and other hazardous building materials prior to renovation or demolition projects
  - A list of areas known to contain asbestos is available from EHS.
  - Reports regarding the results of surveys are provided to project managers and those who request building information.
- EHS has a laboratory in which the materials can be analyzed.
  - Anyone may request information regarding building materials from EHS.

# Role of Environmental Health & Safety (EHS)



- EHS performs **abatement services** for some projects on campus.
  - Determining factors as to whether these are handled by EHS or an outside contractor:
    - Size of the job
    - Location of the job
    - Completion timeline
  - Cost savings are substantial when EHS can conduct the abatement services
  - EHS has fully trained staff members with certified supervisors for the work

# Role of Environmental Health & Safety (EHS)



- EHS also has the capability to conduct **air sampling** in support of abatement projects or to document ambient levels.
- These samples are also analyzed in the EHS laboratory.

# Common Products Constructed with Asbestos

- Many products were made using asbestos.
- Examples include



Fire Blankets



Fire Proof Clothing



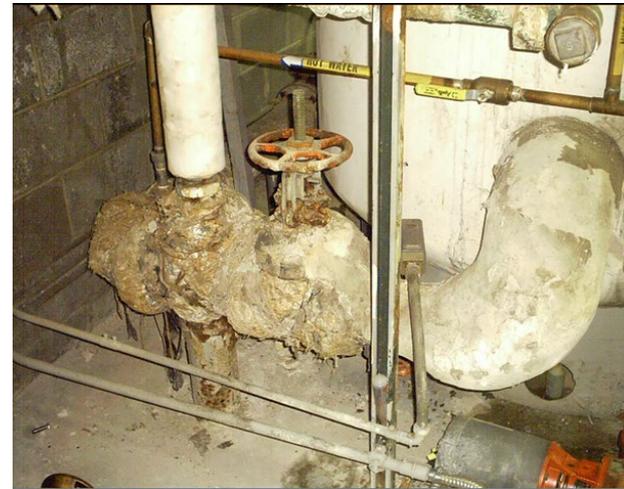
Pipe Insulation

# Common Products Constructed with Asbestos

- Many products were made using asbestos.
- Examples include



Tile Mastic



Boilers & Piping



# Common Products Constructed with Asbestos

- Many products were made using asbestos.
- Examples include



Structural



Roofing

# Common Products Constructed with Asbestos

- Many products were made using asbestos.
- Examples include



Vinyl Floor Tile



Brake & Clutch Linings

# Common Products Constructed with Asbestos

- Many products were made using asbestos.
- Examples include



Adhesives



Siding

# Common Products Constructed with Asbestos

- Many products were made using asbestos.
- Examples include
  - Stage curtains
  - Engine & boiler gaskets
  - Fire doors
  - Caulking
  - Glazing
  - Roof shingles
  - Joint compound
  - Transite Siding

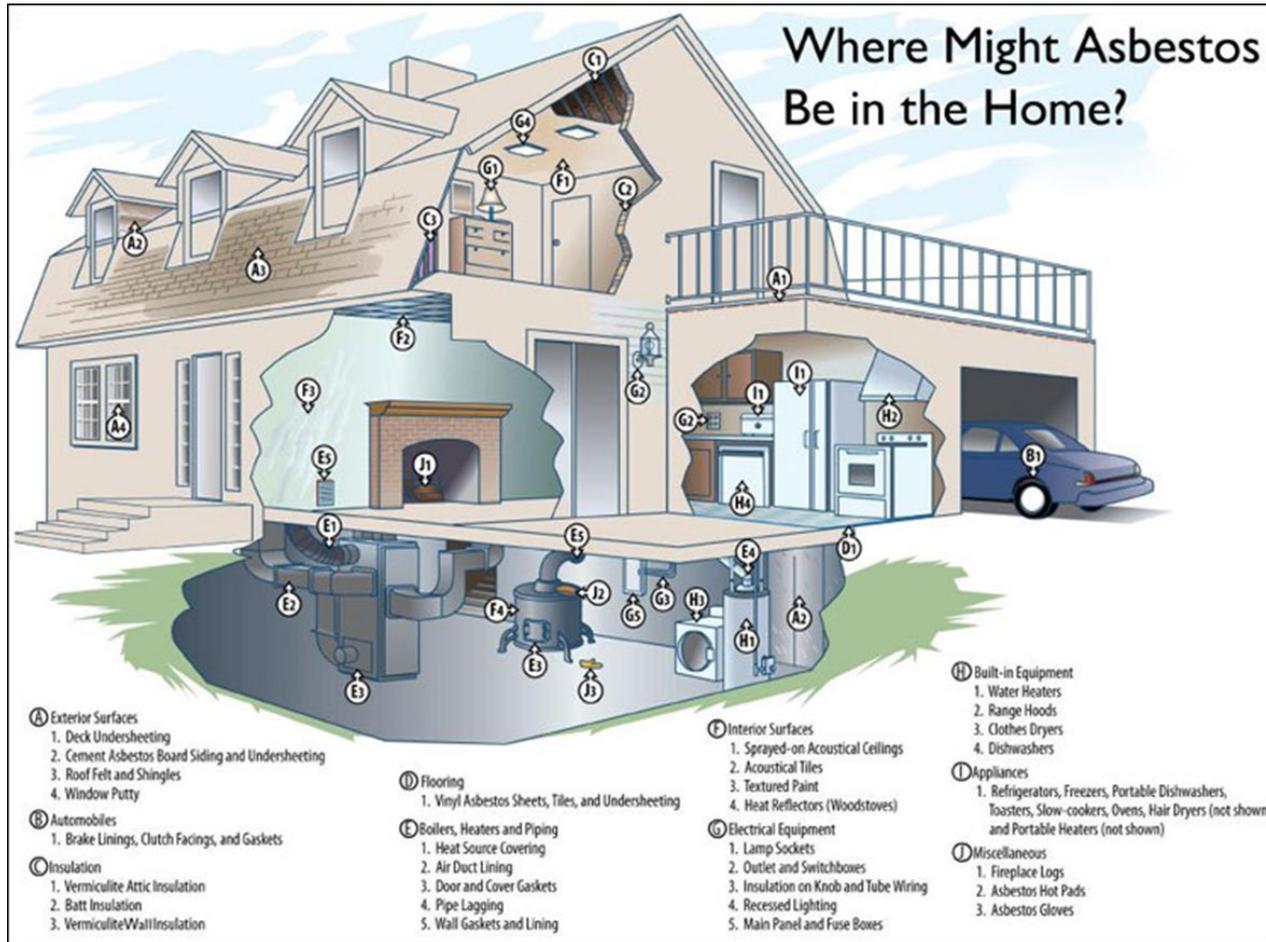


# Products Constructed with Asbestos & Commonly Found on Campus

- Encountered in several different building materials
- Items include
  - Floor tile
  - Tile mastic
  - Linoleum
  - Pipe insulation
  - One shot
  - Boiler material
  - Gaskets
  - Packing rope
  - Sheetrock joint compound
  - Ceiling tile glue
  - Caulking
  - Glazing
  - Transite siding and roofing waterproofing
  - Built up roofing
  - Transite shingles
  - HVAC tape
  - Shower pans



# Many Other Uses of Asbestos



# Locating Asbestos (ACM & PACM)



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# Recognizing ACM & PACM

EHS maintains a list of ACM & PACM in locations that have been previously surveyed, reviewed, and tested, however it is especially important to pay attention anytime materials indicate the following:

- Damage
- Deterioration

Report any damage or deterioration of building materials immediately to your supervisor or EHS directly for further review and testing.





# Requirements related to Housekeeping and Custodial Staff

- Damage
  - An item dropped against ACM could cause fibers to be released into the air
  - Events like roof leaks, boiler failures, steam leaks, and water line leaks or failures, can seriously affect ACM
- Deterioration
  - ACM can deteriorate with age and may become unstable
  - Personnel noticing a change in any material should contact their supervisor immediately or EHS for review of the material and testing

Damage or deterioration of ACM can make exposure to accidental releases of asbestos fibers more likely.

Example of Damage during Housekeeping...

A mop handle is dropped against an asbestos covered pipe causes fibers to be released into the air which may be inhaled posing a health risk to you.



# Requirements related to Housekeeping and Custodial Staff

Safe work practices used to prevent an accidental release of asbestos fibers includes:

- Strip finishes of asbestos-containing flooring using only low-abrasion pads at less than 300 rpm and by using wet methods
- Keep asbestos fibers out of the air
  - Don't burnish or dry-buff tiled floors containing asbestos unless there is enough finish on the surface to prevent the buffing pad from coming in contact with the ACM
  - Never sweep up broken tiles (instead have them tested to determine if ACM)



# Requirements related to Facilities & Maintenance Related Staff

Safe work practices used to prevent an accidental release of asbestos fibers includes:

- Contact EHS prior to beginning any work or renovation where there is a need to handle, cut, remove, grind, sand, hammer or score an item
  - After determining the scope of work, EHS will complete a survey of the area and determine if any materials are ACM
- Don't cut pipe insulation, hammer nails or drill holes in ceilings that might contain asbestos without contacting EHS first for a survey or to review the results of an existing survey
- Never sand flooring materials that contain asbestos



# Requirements related to all Staff Members

Safe work practices used to prevent an accidental release of asbestos fibers includes:

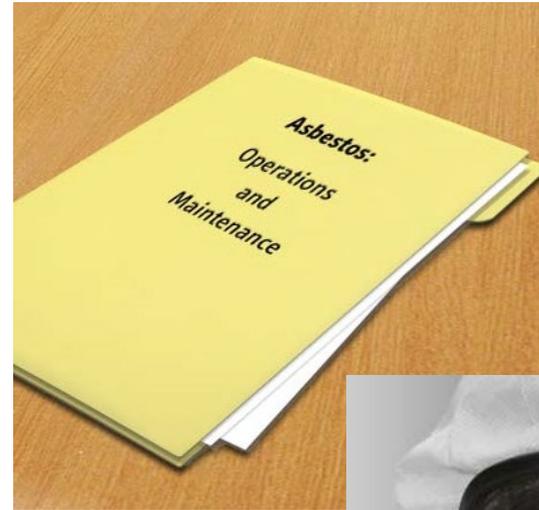
- Don't shovel, sweep or use other dry methods to remove asbestos-containing waste materials. Instead contact EHS immediately to address any concerns or campus needs related to asbestos-containing waste materials.
- Don't use compressed air to remove asbestos or ACM. Again contact EHS to address any concern or campus need related to ACM.



# Proper Response to Fiber Release Episodes

UA has a plan to properly address any damage or deteriorating building materials containing asbestos. Since special training is required to address these situations, do not attempt to handle these situations on your own. Instead contact EHS to review responsibilities to such situations.

Do not enter regulated areas unless authorized, trained and equipped with the proper respirator and other personal protective equipment.



# Fiber Releases

- Fiber releases are classified as either major or minor
  - Major fiber release is any uncontrolled or unintentional disturbance of friable ACBM resulting in a visible release which involves the falling or dislodging of more than 3 square or linear feet of friable ACBM
  - Minor fiber release is any uncontrolled or unintentional disturbance of ACBM resulting in a visible release which involves the falling or dislodging of 3 square or linear feet or less of friable ACBM
- Each type of release episode has specific procedures that must be implemented
- A competent person must supervise all activities involving the removal of asbestos (specific training is mandated)
- EHS staff is comprised of employees with the required training to oversee all activities involved in the removal of asbestos



# Warning Labels & Signs

OSHA regulations require asbestos, like other hazardous material, to have a warning label

- Affixed to products containing asbestos
- All containers of asbestos products
- All containers of asbestos waste material

Warning signs must clearly identify any regulated area that contains asbestos-containing materials (ACMs)

- Do not enter any regulated areas unless authorized, trained and equipped with the proper respirator and other personal protection equipment



# Health Effects

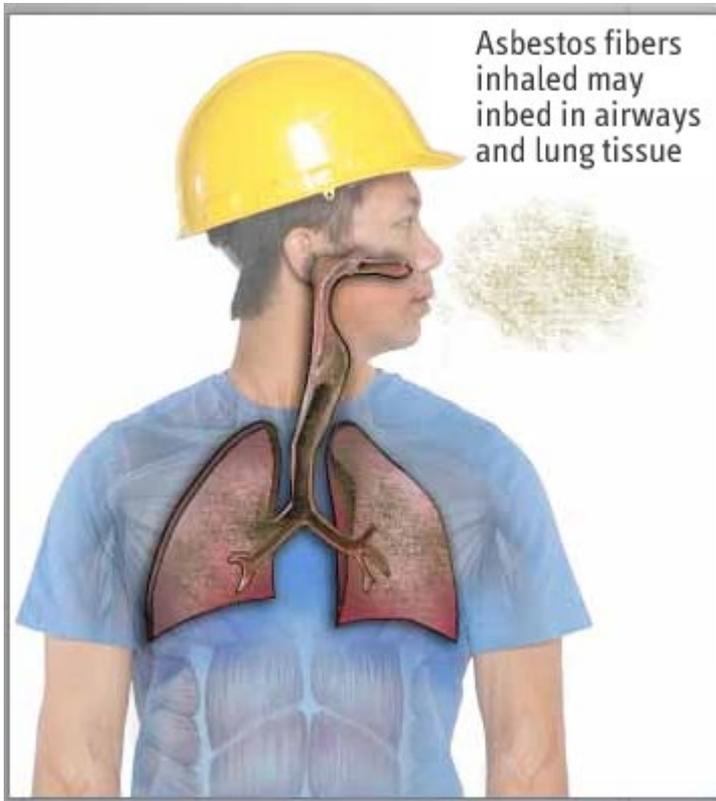
According to the EPA, intact and undisturbed asbestos materials do not pose a health risk

- Asbestos poses a serious health risk when the exposure to asbestos is not governed and ACM become disturbed or damaged (friable)
- Risks of asbestos-related diseases depend upon exposure to airborne asbestos fibers
- Respiratory ailments
- Various types of cancer





# Health Effects



- When you inhale, asbestos fibers can easily penetrate body tissues
  - They may be embedded in the airways and lung tissue
- Ingesting asbestos may also be harmful
- Skin effects of touching asbestos may also exist

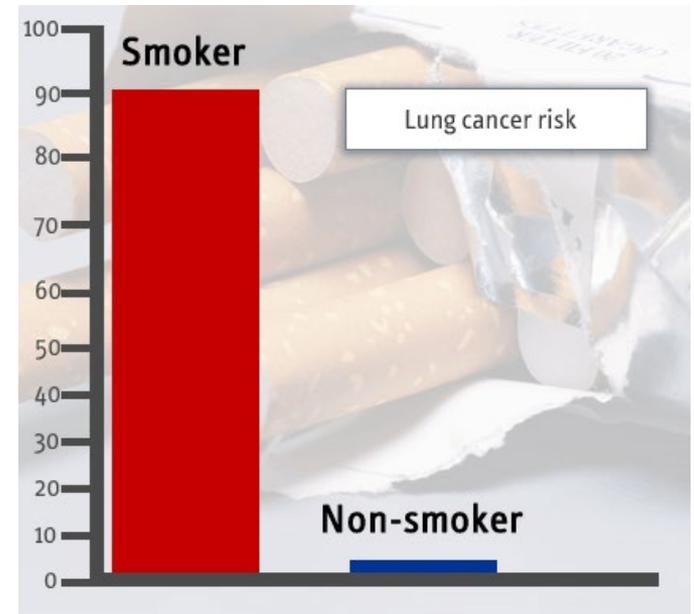
# Health Effects

- Each asbestos exposure increases the likelihood of developing an asbestos-related disease
  - Asbestos-related diseases may not appear until 15 or more years after exposure
  - Medical examinations include medical histories, pulmonary function exams and chest x-rays to detect problems
- Some people exposed to asbestos develop asbestos-related health problems while others do not



# Health Effects

- Research has concluded that the less exposure you receive over a lifetime, the less likely you are to develop an asbestos-related health problem
- Additional factors include
  - Dose of exposure (how much asbestos an individual was exposed)
  - Duration of exposure (how long an individual was exposed)
  - Source of the exposure
  - Individual risk factors (vary from person to person, for instance, there is a synergistic effect between smoking and asbestos exposure)
  - Size, shape and chemical makeup of asbestos fibers (friability)

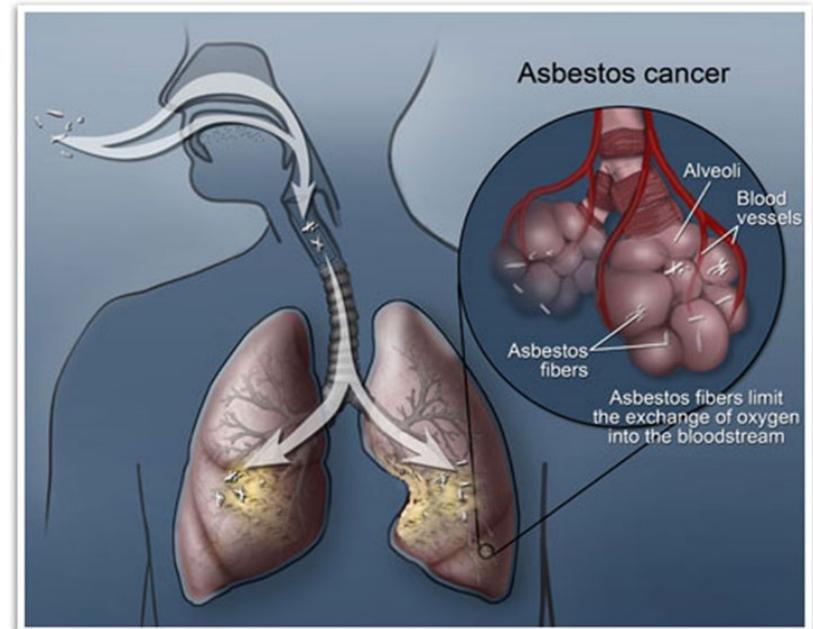


Smokers who are exposed to asbestos appear to be at a greater risk to develop lung cancer or other asbestos-related diseases than those workers who do not smoke.

One study found asbestos workers who smoke were approximately 90 times more likely to develop lung cancer than people who neither smoke nor have been exposed to asbestos.

# Health Effects

- Some possible health effects related to asbestos exposure
  - Lung cancer (causes the greatest number of deaths related to asbestos exposure)
    - However, asbestos can cause cancer in any part of the body
  - Asbestosis (a disease characterized by fibrotic scarring of the lungs and the inability to transfer gasses in the lungs)
  - Mesothelioma (cancer of the lining of the chest wall)
    - Asbestos-associated disease of greatest concern
    - Most rare asbestos-associated disease (only about 3000 cases are diagnosed in the U.S. each year)
- Asbestos-associated diseases have a long lag time between initial exposure and the development of the disease (10 – 40 years)



# Health Effects



- There is no clear dose response curve for asbestos exposure
  - No exposure to asbestos is considered safe.
  - If asbestos exposure increases, so does the risk of an asbestos related disease.
- OSHA has determined how much asbestos in the air is **likely** to pose a health hazard to workers.
  - This was adopted by EPA as a permissible exposure limit (PEL)
  - The PEL indicates the maximum airborne concentration of a contaminant to which an employee may be exposed over an 8-hour day

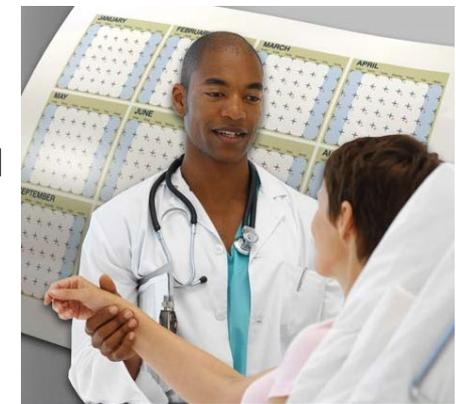
# Written Operations & Maintenance Program



- If an employer measures asbestos fibers above the exposure limits, a written operations and maintenance program must be developed and implemented
  - The goal of the program is to reduce workers' exposure to asbestos
  - The program may require engineering controls, work practice controls, or the use of personal protective equipment (PPE) such as respirators
- Additionally, OSHA regulations prohibit smoking in work areas where there is a risk of asbestos exposure
- OSHA requires employers and doctors who participate in medical surveillance to warn employees about the potential danger of smoking

# Medical Surveillance

- Employees, such as EHS employees responsible for performing asbestos abatement services, that are or will be exposed to hazardous levels of asbestos, will be provided pre-placement medical surveillance
  - Medical exams and procedures are performed by or under the supervision of a licensed physician
  - Medical exams include a medical and work history
  - Physical exams are completed with an emphasis on the respiratory system, the cardiovascular system and digestive tract
  - A standardized respiratory disease questionnaire is completed
  - A chest x-ray is a minimum requirement
  - Another minimum requirement is a pulmonary, or lung, function test that includes forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV 1.0)
  - Additional tests may be added as deemed appropriate by the examining physician
- Medical surveillance and tests are provided at no cost to the employees
- Periodic exams (including a worker's medical and work history, physical exam and medical testing including a full lung function exam or pulmonary function test) are conducted annually as part of the medical surveillance program
- Records of an employee's medical testing must be kept for 30 years plus the duration of employment



# Conclusion



- Asbestos is present in many buildings and materials.
- Asbestos is not hazardous intact and if left in place, however it can be extremely dangerous if it becomes loose (friable) and the fibers are inhaled.
- Inhaling asbestos fibers may lead to disabling respiratory diseases or lung, stomach or colon cancer.
- Regulations require that you know about these hazards and how to protect yourself.
- You should never touch or otherwise disturb asbestos-containing material (ACM).
  - ACM that is dry, loose and crumbles in the hand is considered to be hazardous to your health
- Always check for asbestos warning labels and signs and take the necessary precautions.
- If you are not sure whether something contains asbestos, ask. Contact EHS for more information.





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