Asbestos Awareness Training

April 20, 2015

Quileute Tribal School

Who is required to have this training:

- The Occupational Safety and Health Act (OSHA) requires all members of the maintenance and custodial staff who may work in a building that contains Asbestos Containing Building Material (ACBM) to complete a “asbestos awareness” course.

  Custodians, electricians, heating/air conditioning engineers, plumbers, etc.

- Training should be at least 2 hours.

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Who is required to have this training:

- Members of maintenance and custodial staff who conduct activities that will result in disturbance of ACBM

- Training should be at least 2 hours, plus 14 hours of additional training.

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After viewing this PowerPoint, you will know:

- Where to find information on the asbestos locations at your school.
- Who to report damaged asbestos to.
- Who the School's Designated Asbestos person is.

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- Where is the ACBM in your school building?
- Who will you report ACBM damage to?
- Where is the Asbestos Management Plan for this school?

THE LAW

The Asbestos Hazard Emergency Response Act (AHERA) requires:

- All buildings at public schools to be inspected for asbestos.
- Every School to document this inspection in an Asbestos Management Plan.
- Every School to perform 6-month surveillance of asbestos containing materials.
- Annual training of maintenance and custodial workers on asbestos.

THE LAW

- A 3-year reinspection of all buildings containing asbestos.
- Someone at the School to be the Designated Person.
- The Designated Person to be trained in asbestos.
- The School to annually notify parents, guardians, employees and temporary workers of the availability of the Asbestos Management Plan for review and any actions taken for management of the asbestos at the School.

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- Who is the Designated Asbestos Management Person for the School?

  Jay D. Matsen (Acting)

- Will I be informed of asbestos actions at the School for this past year? **YES!**
- How? For Students - In the Student Handbook. For employees - on the staff bulletin board.

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- Where is the Asbestos Management Plan for Quileute Tribal School kept?

  Accounting Office

- Can I view the Asbestos Management Plan <u>anytime</u> upon request?

  YES!

AHERA Required Topics

- Asbestos background – History & Law
- Asbestos' Health Effects
- Information about asbestos' uses and forms
- Locations of ACBM where you work
- How to recognize damage, deterioration AND delamination of asbestos materials
- Name & phone number of AHERA Designated Person
- Location & availability of Management Plan

Reference: 40 C.F.R. §763.92

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What is Asbestos?

What is Asbestos?

- A “Naturally” occurring mineral.
- Earlier mined in Canada and S. Africa, now China, India, Russia & Korea.
- Added to building materials because of its good insulating, strength, sound-proofing, fireproofing and corrosion-resistance properties.

Properties of Asbestos

Asbestos ore

Asbestos fibers

- Naturally occurring fibrous minerals
- Good tensile strength
- Flexible
- Heat resistant
- Electrical resistance
- Good insulation
- Chemical resistant

Because of these unique properties, asbestos was used extensively in variety of products.

Natural Asbestos

What is Asbestos?

- Two major classes– serpentine and amphibole
- Chrysotile (white asbestos) – the only member of the serpentine class
- Amosite (brown asbestos), crocidolite (blue asbestos), anthophylite, tremolite, and actinolite -- amphiboles

What is Asbestos?

- All types of asbestos tend to break into very tiny fibers.
- Individual fibers are virtually invisible, they can only be seen using a microscope.
- Some fibers may be 10,000 times smaller than a human hair.
- Can remain suspended in the air for up to three days.

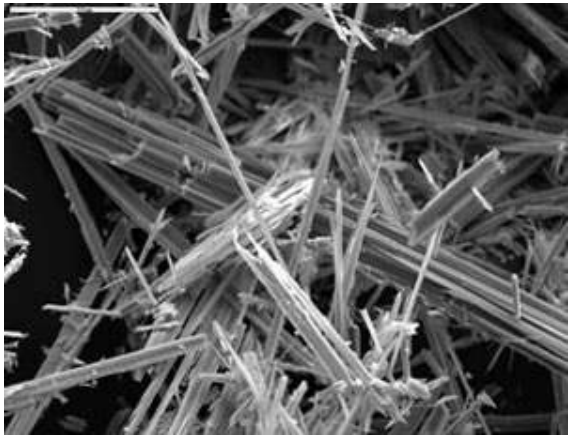
What is Asbestos?

Usually asbestos is mixed with other materials to actually form the products. Floor tiles, for example, may contain only a small percentage of asbestos.

Types of Asbestos

Most commonly used:

- Chrysotile - “White asbestos”
- Amosite - “Brown asbestos”
- Crocidolite - “Blue asbestos”



Asbestos fibers, high magnification

“Blue Asbestos”-

Others:

Tremolite
(sometimes found in vermiculite)

Actinolite

Anthophyllite

The History of Asbestos

- Ancient Greeks made it into cloth and named it “indestructible!”
- 1st century AD: Romans saw that slaves who weaved asbestos into cloth developed breathing problems.
- 1879: First commercial production.
- 1899: First documented case of lung scarring due to asbestos.

History of Asbestos

- 1930's: Medical journals begin publishing articles on asbestos related diseases.
- 1960 - 1970's: Use of asbestos peaked.
- 1989: EPA banned most asbestos containing building materials (ACBMs) BUT ….
- 1991: The Asbestos Ban "Overturned" by Courts.
- 2005: Criminal charges begin for Asbestos Deaths.

Banned Asbestos Materials

EPA banned the use of the following products:

- Spray-applied surfacing Asbestos Containing Materials (ACMs).
- Sprayed-on application of ACMs with more than 1% asbestos to buildings, structures, pipes, and conduits, *unless the material is encapsulated with a bituminous or resinous binder during spraying and the materials are not friable after drying.*

Banned Asbestos Materials

- Wet-applied/pre-formed asbestos pipe insulation, and pre-formed asbestos block insulation on boilers /hot water tanks.
- Corrugated paper, roll-board, commercial paper, specialty paper, flooring felt, and new uses of asbestos.
- Materials spray-applied to buildings, structures, pipes & conduits except bituminous/resinous.
- Any new uses.

Banned Asbestos Materials

QUICK REVIEW

- Spray-applied asbestos containing materials (ACMs) for fireproofing.
- Wet-applied and Thermal System Insulations (TSI).
- Spray-applied ACM for decoration.
- Corrugated paper, roll-board, commercial paper, specialty paper.
- Flooring felt.

How do We Avoid ACBMs?

Do products' labels state "contains asbestos?"

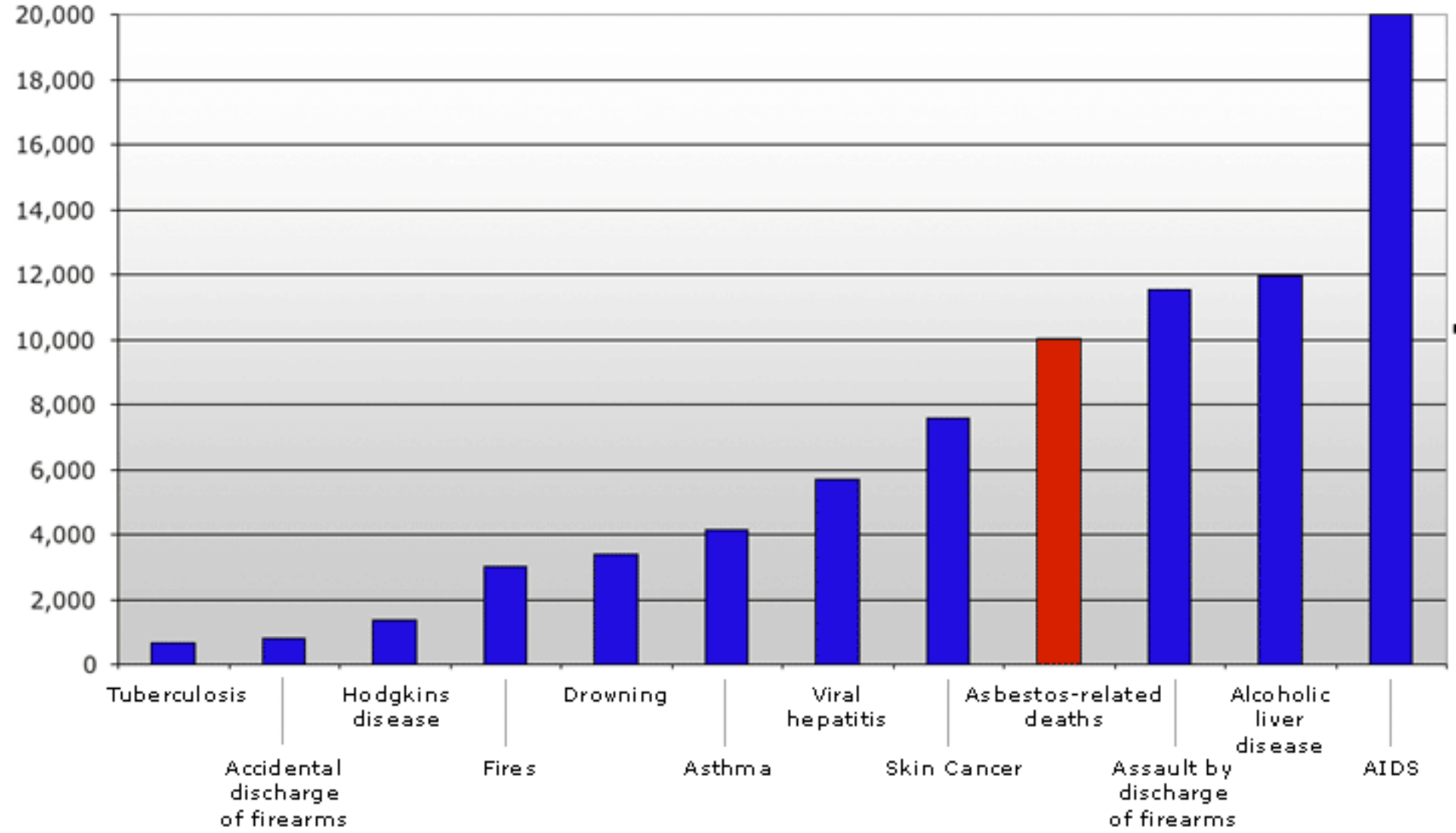
Not Always!

How do We Avoid ACBMs?

- Request copy of the Material Safety Data Sheet (MSDS).
- Or, obtain an “Asbestos-free” Certification from distributor / manufacturer.
- Use trusted brands.

Asbestos and Health

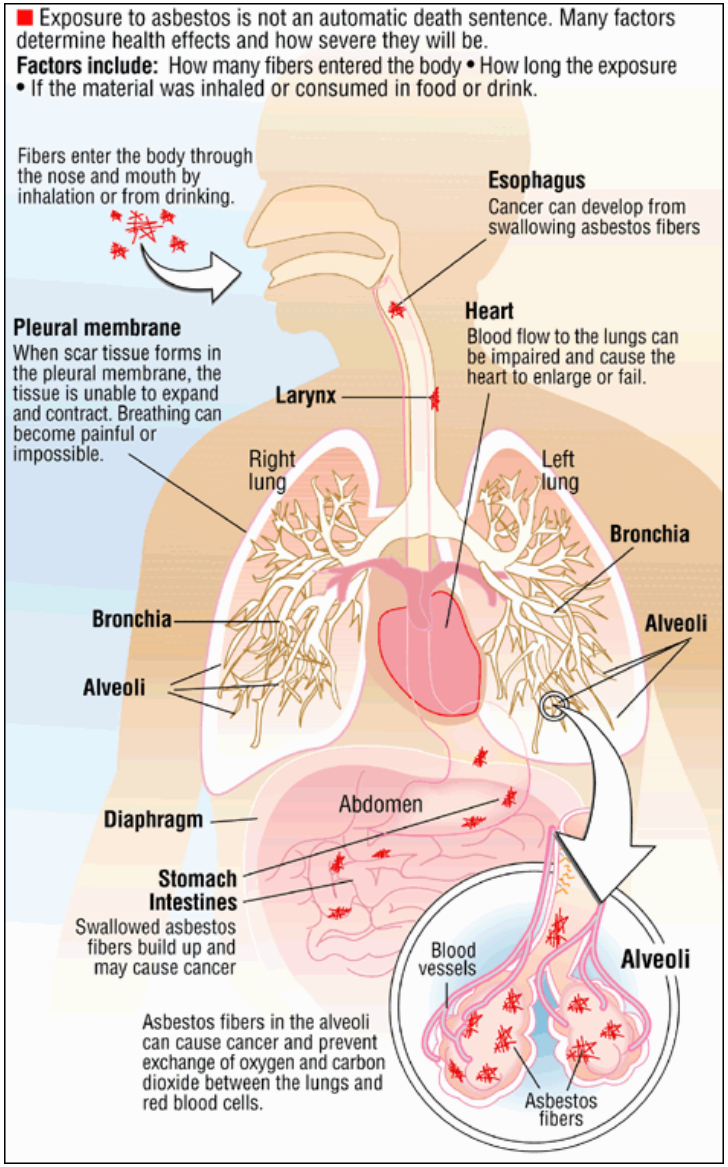
Asbestos-related deaths are at an epidemic scale in the United States



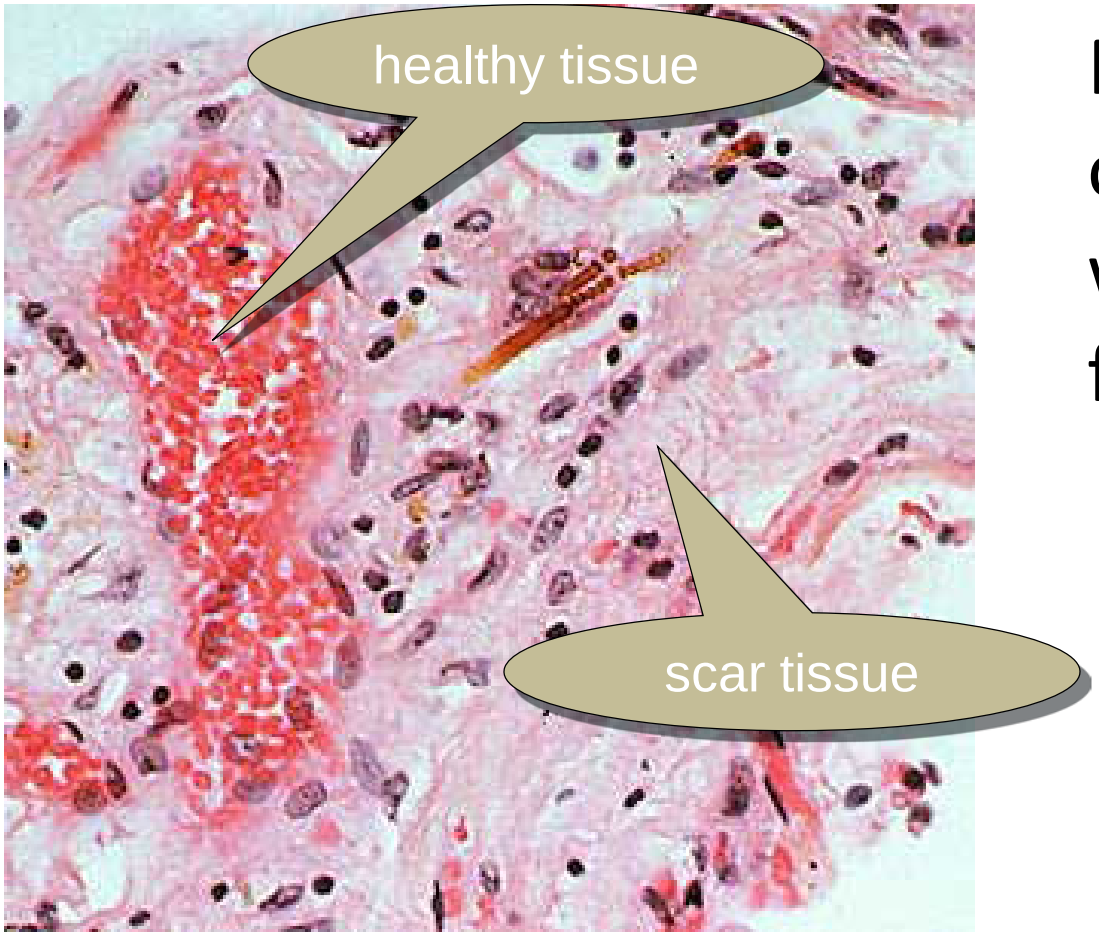
Source: EWG Action Fund estimate for asbestos deaths (2002). Center for Disease Control and Prevention, NCHS, National Vital Statistics Reports, Deaths: Preliminary Data for 2002, Volume 52, Number 13, February 2004.

Asbestos Health Effects

- Inhalation is most common and damaging pathway into the body.
- Asbestos-related diseases show dose-response relationship.
- Diseases are treatable but not curable.



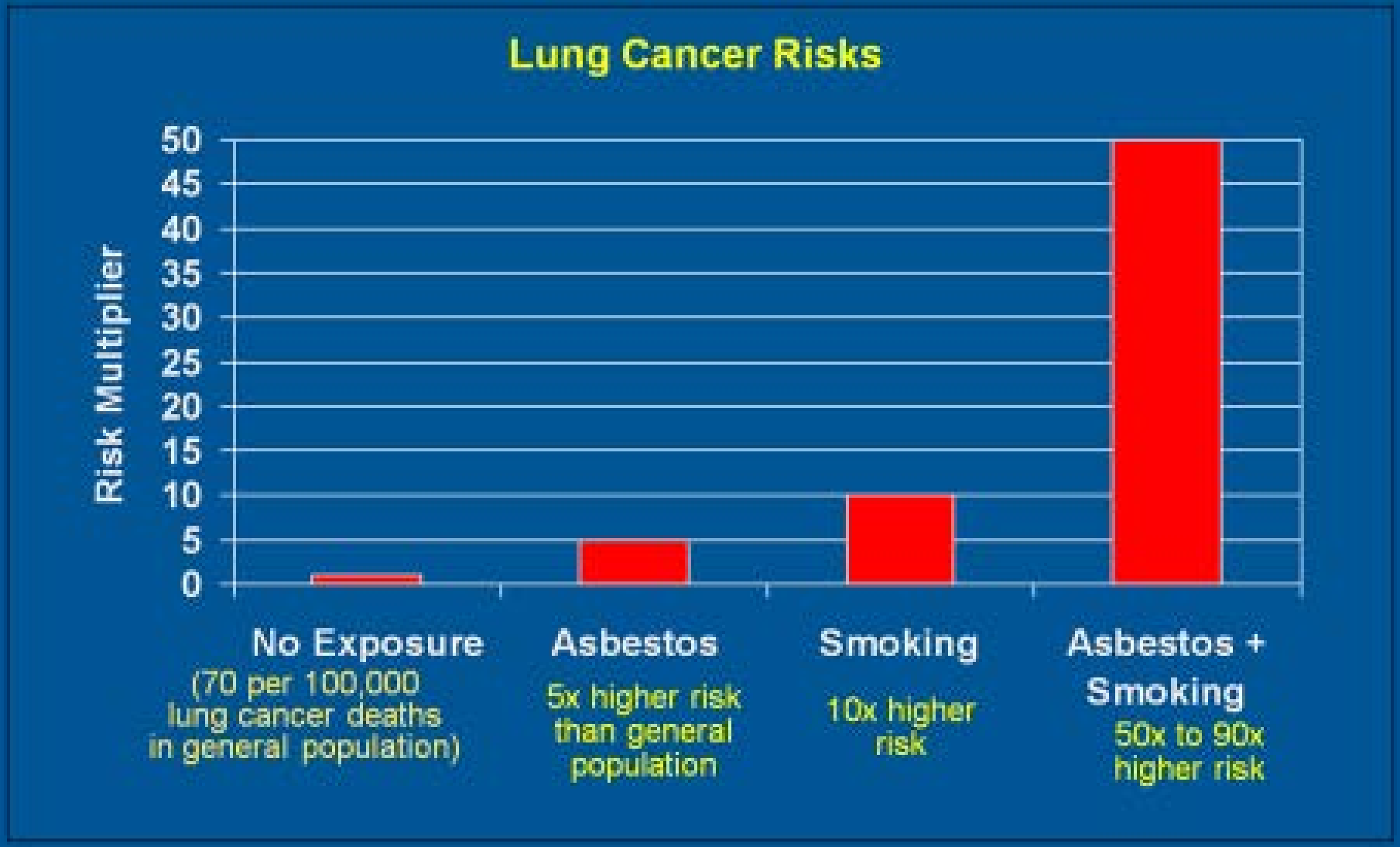
Asbestos Health Effects



Microscopic view of lung tissue with asbestos fibers embedded.

Lung Cancer

Lung cancer causes the largest number of deaths from asbestos exposure. The risk greatly increases in workers who smoke.



Asbestos-related diseases

The potential for asbestos related disease depends on:

- Amount of fibers inhaled
- Length of exposure
- Whether exposed worker smokes
- Age – because of delayed effects

Don't smoke! An asbestos worker is at much greater risk of developing lung cancer if he/she smokes.

Asbestos Health Effects

ASBESTOSIS: fibrotic scarring of the lungs. Not a cancer.

- Symptoms: shortness of breath, rales, clubbing of fingers, chest pain, loss of appetite.
- Prognosis: slow, painful death; progressive & increases susceptibility to other heart/lung diseases.
- Long latency: 15 to 30 years.
- Common to workers with high exposure over many years.

Asbestosis Example

Joe Darabant, 1949, covered with chrysotile asbestos fibers. Worked for 30+ years at the Johns-Manville Plant in New Jersey, cutting asbestos shingles and making asbestos block and pipe-covering materials.

Joe, 1989. Forced to retire in 1974 at age 50 from poor health; he died from asbestosis in 1990 at age 66.

Asbestosis is a serious chronic, progressive disease that can eventually lead to disability or death in people exposed to high amounts of asbestos over a long period. Asbestos fibers cause the lung tissues to scar; when the scarring spreads, it becomes harder and harder to breathe. Symptoms include shortness of breath, a dry crackling sound in the lungs while inhaling, coughing, and chest pain. This condition is permanent and there is no effective treatment.

Asbestos Health Effects

Lung Cancer has many causes:

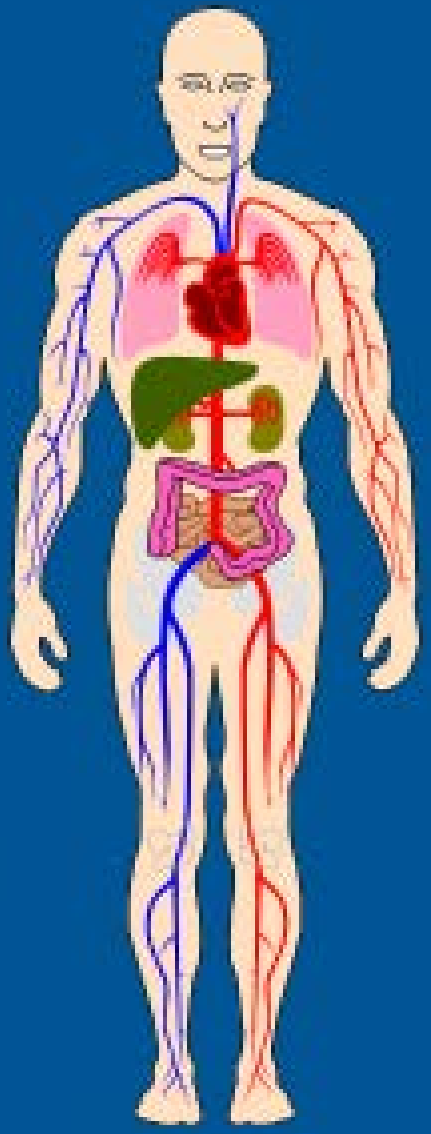
- Symptoms: persistent cough, chest pain, wheezing, labored breathing.
- Prognosis: slow, painful death.
- Smoking increases risk 50 to 90-fold.
- Long Latency: 15 to 30 years.
- High levels and long-term increase risk but there's no "safe level" of exposure.

Other Cancers

Evidence suggests that ingesting asbestos can also cause cancers in the:

- esophagus
- larynx
- oral cavity
- stomach
- colon
- kidney

Fibers can enter the mouth and be swallowed. Poor hygiene, leaving food/drinks out in contaminated areas, and carelessness can result in the ingestion of asbestos.



Asbestos Health Effects

Mesothelioma – rare cancer of chest lining.

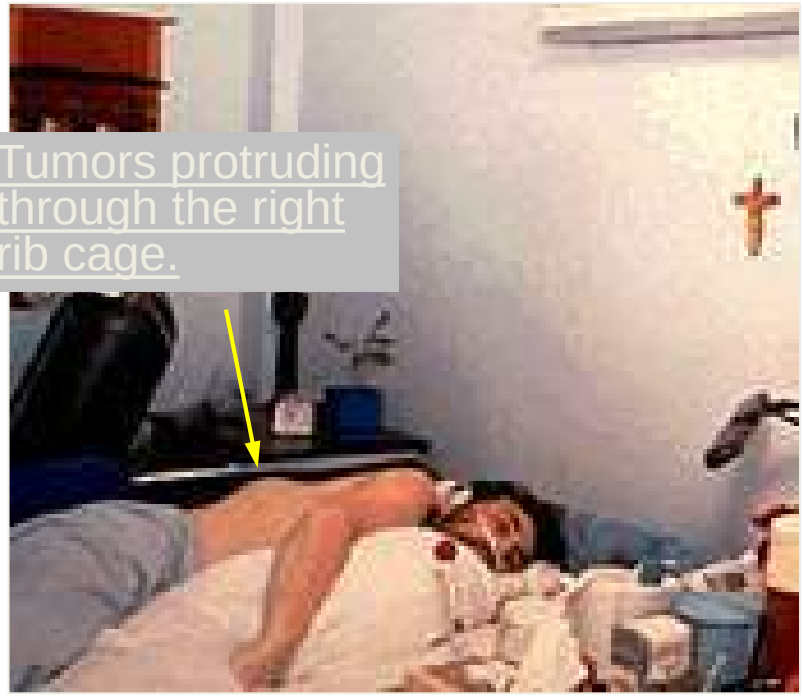
- Symptoms: shortness of breath, chest pain, fluid in chest cavity.
- Prognosis: generally quick (1 year after diagnosis), painful death.
- Long latency: 30 years or more.
- Dose-response not as clear, but asbestos exposure is the leading cause (70%-80% of cases).

Mesothelioma Example

Photo © RAVANESI@2000

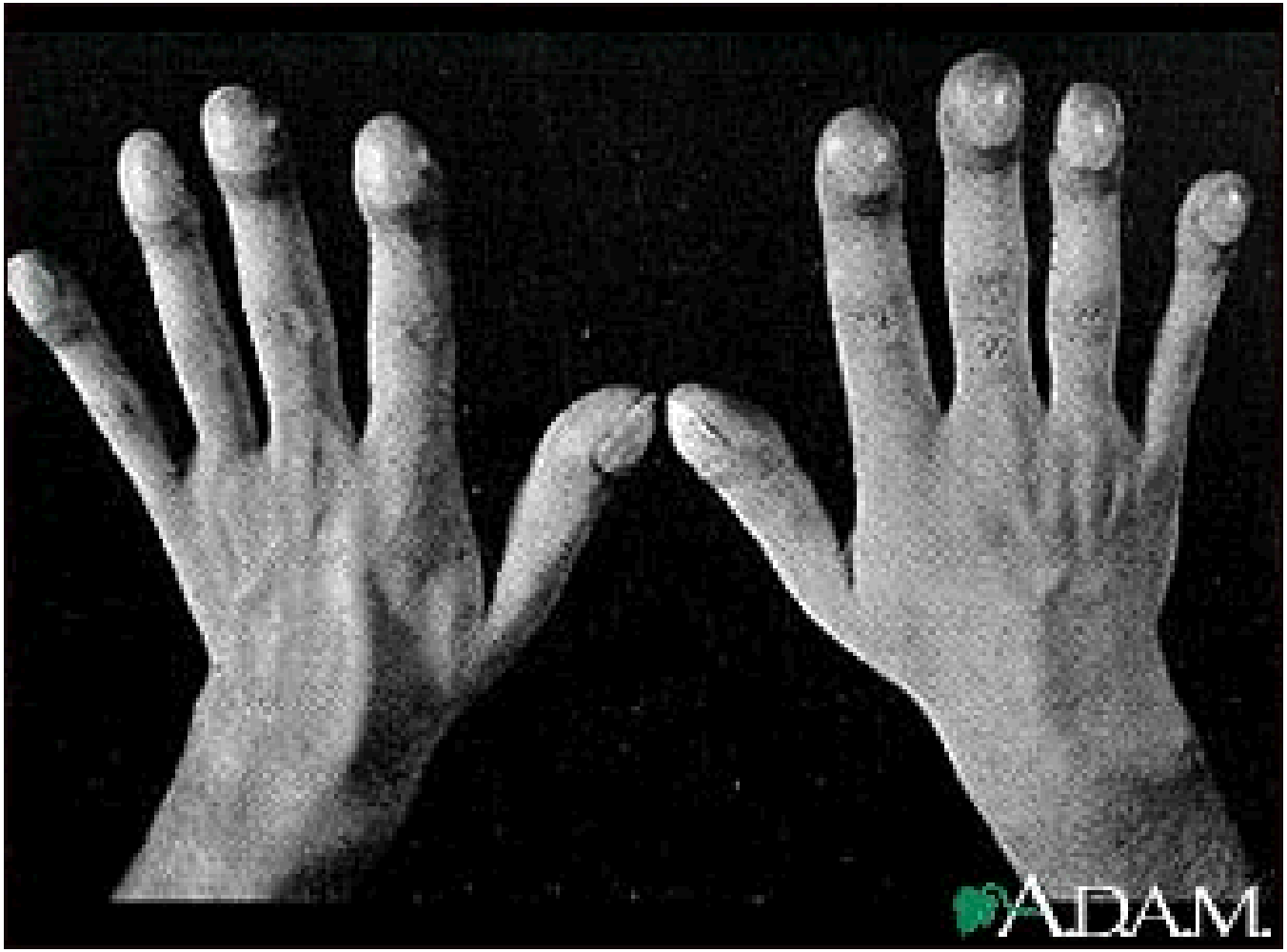
Mesothelioma is a rare form of cancer of the pleura, the thin membrane lining the lungs. About 200 cases are diagnosed each year in the U.S. Virtually all cases are linked with asbestos exposure.

The cancer is very invasive and spreads quickly, eventually crushing the lungs so that the patient cannot breathe. It is painful and always fatal. It can be caused by very low exposure and is not directly related to the amount inhaled. This cancer may take 30-40 years to develop.



Richard Pankowski, 1986. Diagnosed in 1985 with pleural mesothelioma; died 5 months later at age 36. In college, he worked for less than a year at the Manville Plant in N.J. Father also worked at the plant 30+ years and died from asbestosis. Richard's exposure may have begun when he was a child.

Asbestos Health Effects – Clubbing of Fingers



Asbestos Containing Building Material (ACBM)

Only ACBM if greater than 1% asbestos

There are three main types:

- Thermal System Insulation (TSI)
- Surfacing Material
- Miscellaneous

And two classes:

- Friable
- Non-friable

ACBM Classes

Friable: A material that, when dry, may be crumbled, pulverized or reduced to powder by hand pressure, and includes previously non-friable material after it has been damaged to the extent that it has now become friable

ACBM Categories

Non-Friable:

- Category I – packing, gaskets, resilient floor covering and asphalt roofing products
- Category II – everything else (i.e., asbestos/cement products in good condition)

How do asbestos fibers get in the air?

Physical disturbance of asbestos-containing materials can suspend fibers in the air.

Asbestos is most hazardous when it is “FRIABLE”.

- Friable: can be easily crumbled or crushed by hand, releasing fibers into the air
- Very small fibers stay in the air for long periods
- Damaged or deteriorated ACM increases friability

Photo of friable asbestos

Non-friable ACM (floor and ceiling tiles, house siding, fire doors, etc.) won’t release fibers unless disturbed or damaged in some way.

Asbestos Containing Building Materials (ACBM)

Thermal System Insulation (TSI):

- Pipes
- Boilers
- Ducts
- Includes elbow and joint mudding
- Can be subject to significant damage from water leaks, steam leaks, and incorrect repairs unless otherwise protected

Uses of Asbestos

Asbestos insulated pipe

Asbestos insulated boiler

Asbestos has been used for centuries, but greatly increased during and after World War II in ship insulation and the following:

- Pipe insulation
- Surfacing insulating materials
- Reinforcement of materials
- Fireproofing
- Acoustic and decorative plaster
- Textiles

Use has greatly declined since the late 1970's.

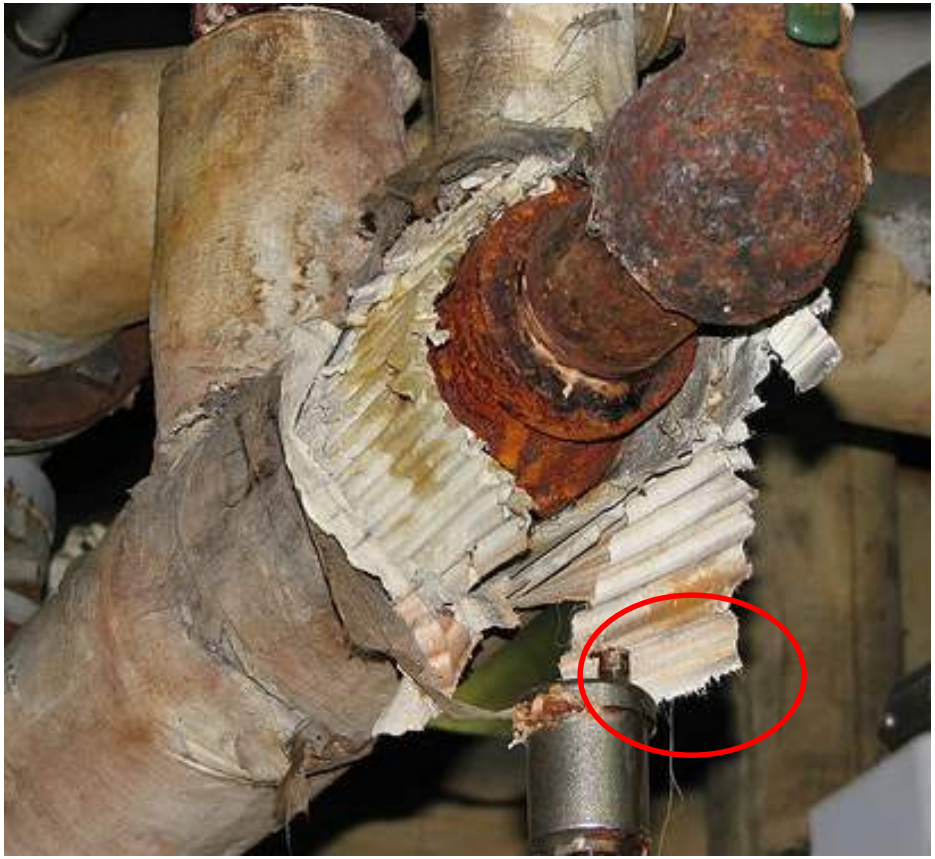
ACBM – TSI – severely damaged

TSI (Thermal System Insulation)

ACBM – TSI –(cross-section)

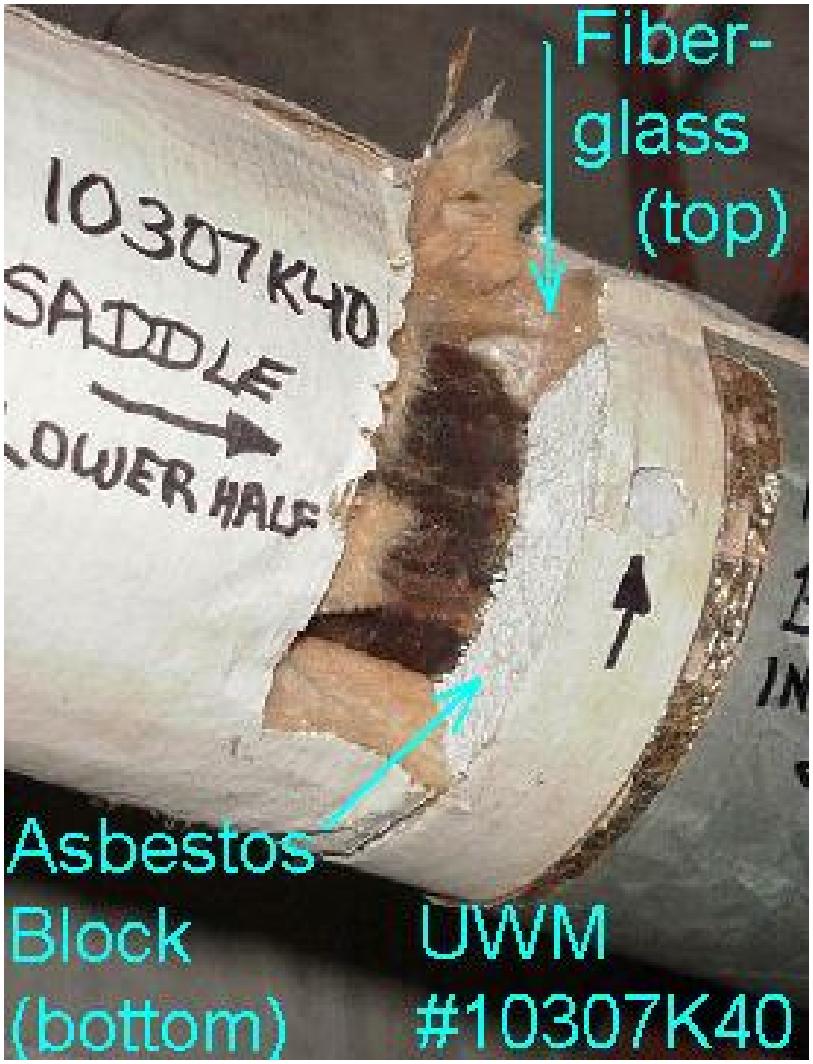
ACBM – TSI – Damaged pipe insulation (Boilers)

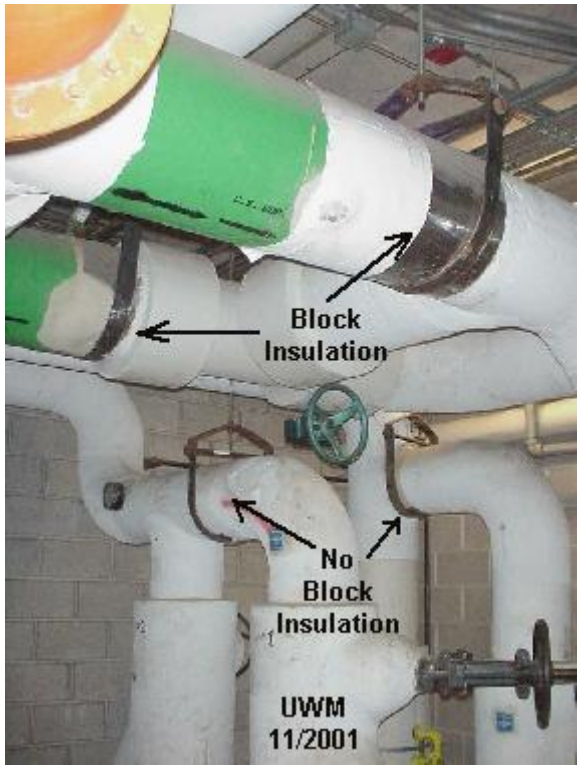
Damaged Asbestos Pipe Insulation



This damaged pipe insulation is a health hazard to persons working around it, handling it or removing it. Asbestos fibers are visible on the torn edges.

ACBM – TSI - block





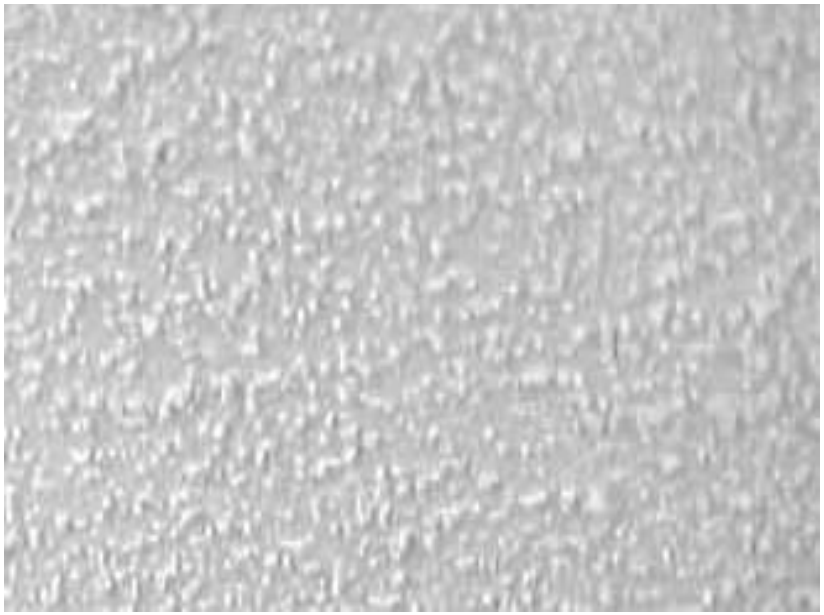
ACBM – TSI – Asbestos Rope

Asbestos Containing Building Material (ACBM)

Surfacing Material

- Condensation control
- Acoustical insulation
- Decoration
- Fireproofing
- Sprayed-on or troweled-on

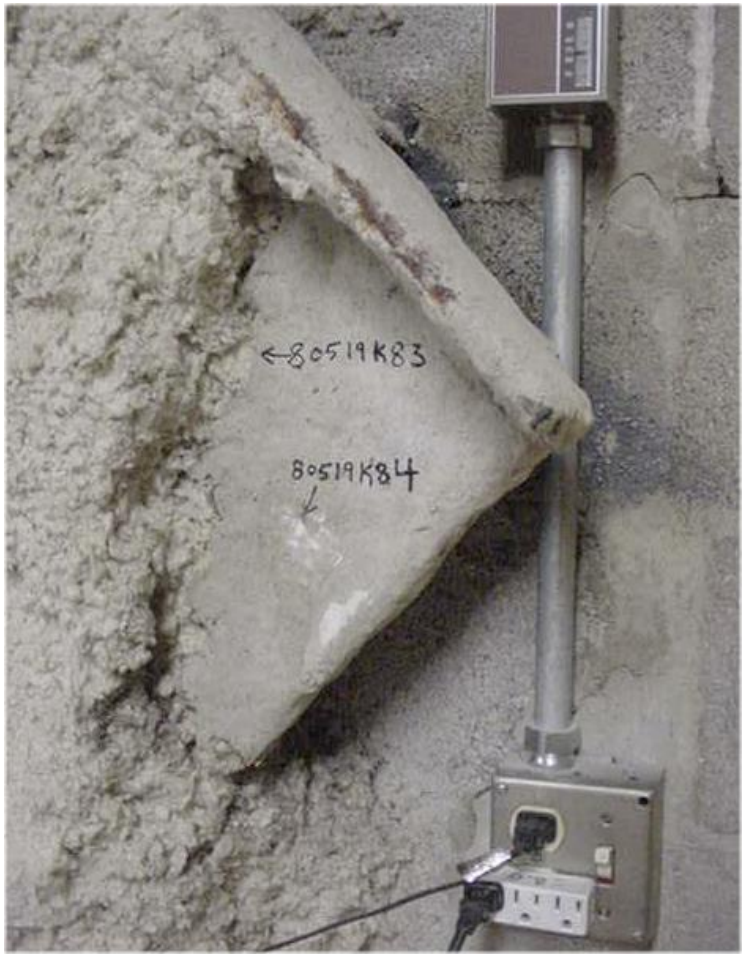
ACBM – Surfacing

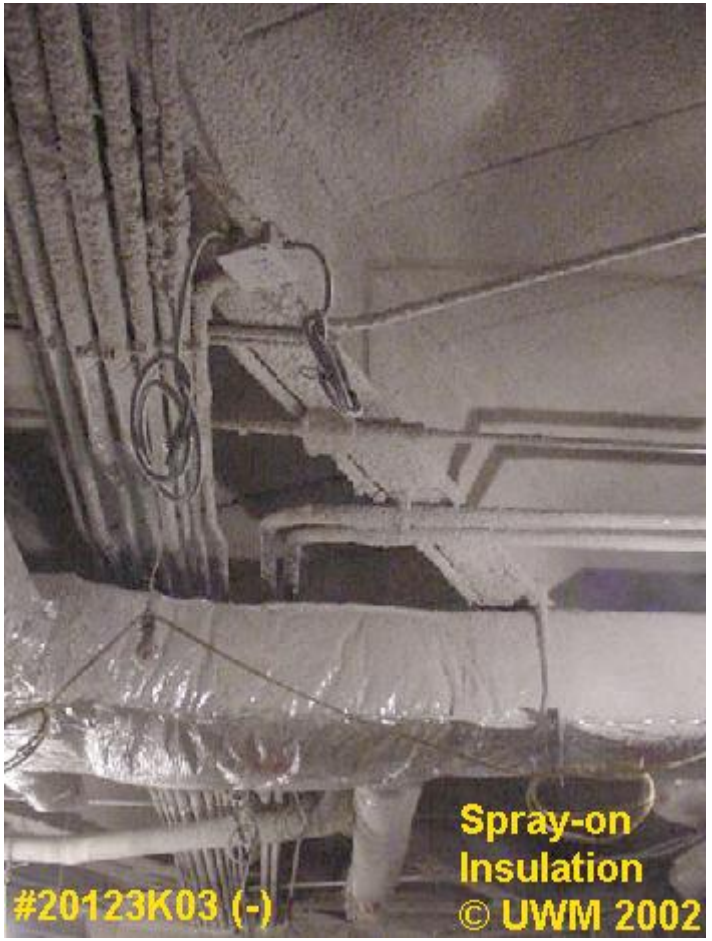


Popcorn Ceiling

Structural Steel and Deck Coating

ACBM – Surfacing





Asbestos Containing Building Materials (ACBM)

Miscellaneous:

(Miscellaneous asbestos containing material is usually non-friable)

- Floor and ceiling tiles
- Gaskets, mastic, plaster, wallboard
- Asbestos/cement products
- Fabrics such as stage curtains are not ACBM
- Roofing felt, mastic and siding are not covered under AHERA

Miscellaneous ACBM – VAT
VAT – Vinyl Asbestos Tile

Misc. ACBM Asbestos - Cement

Examples of Uses of Asbestos

Sprayed-on fireproofing material

Sheet vinyl containing asbestos

Vinyl asbestos flooring

These products may be found in homes and buildings constructed before 1981.

Misc. ACBM Asbestos-Cement

Asbestos Cement Board

The most commonly produced ACM worldwide today

Misc. ACBM – Wallboard Systems

Asbestos Mill Board

Asbestos millboard was used in the construction of walls and ceilings, especially around furnaces and wood-burning stoves, where insulation and fire protection was required. Most varieties of asbestos millboard typically contained between 80% and 85% asbestos.

ACBM - Miscellaneous

Some Asbestos-Containing Materials*

- Cement Pipes
- Cement Wallboard
- Cement Siding
- Asphalt Floor Tile
- Vinyl Floor Tile
- Vinyl Sheet Flooring
- Flooring Backing
- Construction Mastics (floor tile, carpet, ceiling tile, etc.)
- Acoustical Plaster
- Decorative Plaster
- Textured Paints/Coatings
- Ceiling Tiles and Lay-in Panels
- Spray-Applied Insulation
- Blown-in Insulation
- Fireproofing Materials
- Taping Compounds (thermal)
- Packing Materials (for wall/floor penetrations)
- High Temperature Gaskets
- Laboratory Hoods/Table Tops
- Laboratory Gloves
- Fire Blankets
- Fire Curtains

(This list does not include every product/material that may contain asbestos. It is intended as a general guide to show which types of materials may contain asbestos.)

* **Source: EPA**

Some Asbestos-Containing Materials
(Continued)

- Elevator Equipment Panels
- Elevator Brake Shoes
- HVAC Duct Insulation
- Boiler Insulation
- Breaching Insulation
- Ductwork Flexible Fabric Connections
- Cooling Towers
- Pipe Insulation (corrugated air-cell, block, etc.)
- Heating and Electrical Ducts
- Electrical Panel Partitions
- Electrical Cloth
- Electric Wiring Insulation
- Chalkboards
- Roofing Shingles
- Roofing Felt
- Base Flashing
- Thermal Paper Products
- Fire Doors
- Caulking/Putties
- Adhesives
- Wallboard
- Joint Compounds
- Vinyl Wall Coverings
- Spackling Compounds

Some Terms: “ACM” and “PACM”

Asbestos Containing Material

Any material containing more than 1% asbestos by weight.

Presumed Asbestos Containing Material

Installed prior to 1981 {

- Surfacing materials
- Thermal System Insulation
- Flooring

Must be handled as ACM unless proved otherwise

Many uses of asbestos have been banned under EPA and Consumer Product Safety Commission regulations. However, some materials where asbestos fibers are generally well bound in the materials were not banned.

Previously installed products still pose a hazard to workers. Asbestos fibers can be released during repair work, demolition, and renovation of older buildings and structures containing ACM.

Vermiculite – Some products contained asbestos.

Vermiculite insulation in attics

Asbestos in gaskets and fabric

Asbestos gaskets– may be round, flat or impregnated with waterproof sealant

Asbestos fabric in HVAC system

Damaged asbestos gasket

Cement-asbestos Pipe (Transite)

ASBESTOS CEMENT
(AC) PIPE

ASBESTOS CEMENT
LAB FUME HOOD
EXHAUST DUCT

Cement-asbestos pipe, sometimes called Transite, was used underground and above ground in years past and may show up in pipe replacement jobs, building demolition jobs or excavations.

Asbestos Ceiling Tile (used until about 1980)

Tile close-up

Usually white and in 1’ by 1’ or 2’ by 4’ sizes

Asbestos Shingles and Siding

Removal done correctly

Found in older houses – not to be confused with newer asbestos-free cement siding. There is little hazard unless disturbed. The top right hand picture shows a siding replacement job with broken green asbestos shingles which would have released dust and fibers into the air if done incorrectly.

Recognizing Damage to ACBM

- Look for holes, rips, water stains, abrasion.
- Do not attempt to clean up loose or fallen asbestos. Contact the AHERA Designated Person.
- Remember the asbestos fibers are invisible without a microscope.
- You need to know where the asbestos is and always respond to any visible damage as though there has been a release.

Asbestos Regulations

Asbestos Hazard Emergency Response Act (AHERA):

- Congress passed October 1986.
- EPA rules are effective as of December 14, 1987.
- Applies to all public and private schools and Local Education Agencies (LEA).
- Requires inspection, management plan, training, notifications, labels, and a Designated Person.

Asbestos Regulations

Asbestos School Hazard Abatement Reauthorization Act (ASHARA):

- Extends some of the AHERA requirements to public and commercial buildings.
- Doesn't require inspections/management plans
- Does require use of accredited personnel
- Increased training requirements for workers and supervisors

Asbestos Regulations

National Emission Standards for Hazardous Air Pollutants (NESHAP):

- Requires inspection and abatement prior to renovation or demolition.
- Established definitions for Category I & II non-friable ACM.
- Established the “no visible emissions” standard.
- Requires notification to the State when over certain threshold quantities.

Asbestos Regulations

OSHA Asbestos Regulations:

- General industry standards cover building occupants.
- Construction standards apply when working on materials containing asbestos, renovation, repair or removals.
- Mandates air sampling, medical monitoring, protective equipment including respirators, safe work practices, etc. in certain circumstances.

Asbestos Regulations

EPA Worker Protection Rule:

Extends the OSHA standards to state and local employees who might not otherwise be covered.

Asbestos Regulations

- Some states have adopted their own asbestos regulations or have taken responsibility for enforcing the EPA regulations.
- Always check local laws.
- Congress has been considering new, more comprehensive, asbestos laws – stay tuned.

Quiz
Question #1

Asbestos training is required under:

a. The Clean Air Act
b. National Environmental Act
c. Occupational Safety and Health Act
d. The Clean Water Act

Quiz
Question #2

Which of the following asbestos containing material products have been banned by the EPA:

a. Spray-applied asbestos containing materials (ACMs) for fireproofing.

b. Wet-applied and Thermal System Insulations (TSI).

c. Corrugated paper, roll-board, commercial paper, specialty paper.

d. All of the above

Quiz
Question #3

Miscellaneous asbestos containing materials are usually:

a. Friable
b. Non - friable
c. Applied to boilers as insulation
d. Used as fireproofing

Quiz
Question #4

One of the most common uses for spray applied asbestos in a commercial building was:

a. Cooling tower fill
b. Electrical panel insulation
c. Valve packing
d. Fireproofing

Quiz
Question #5

In what years was the use of asbestos as a building material most prevalent:

a. 1920 – 30’s
b. 1940 – 50’s
c. 1960 – 70’s
d. 1980 – 90’s

Quiz
Question #6

The primary organ that asbestos affects is the:

a. brain
b. circulatory system
c. intestines
d. lungs

Quiz
Question #7

Friable asbestos is:

a. contained in a solid matrix of other materials

b. not regulated by OSHA or the EPA

c. easily reduced to powder by ordinary hand pressure

d. produced only in the *Freeabale* province of France

Quiz
Question #8

Thermal system insulation can be damaged by:

a. Water leaks
b. Steam leaks
c. Incorrect or unauthorized repair procedures
d. All of the above

Quiz
Question #9

If you find that a large amount of asbestos containing ceiling plaster has fallen to the floor in an office you should:

a. Keep people away, notify your AHERA designated person, and wait for further instructions.

b. Ignore the problem and hope that nobody will notice.

c. Begin a clean up procedure immediately.

d. Immediately call in the HAZMAT team.

Quiz
Question #10

The Asbestos Hazard Emergency Response Act (AHERA) applies to all public and private schools and Local Education Agencies (LEA) and:

a. Extends the OSHA standards to state and local employees who might not otherwise be covered.

b. Requires inspection, management plan, training, notifications, labels, and a Designated Person.

c. Established the “no visible emissions” standard.

d. All of the above

Evaluating Asbestos Hazards

Type of Material

- What is the asbestos content (greater than 1%)?
- Is it friable or non-friable?
- What is the location – is it isolated or accessible to workers?

Condition of Material

- Is it intact with no damage?
- Is it in poor condition – damaged, disturbed or no longer intact?

Activity

- Are employees working in the area where asbestos is found?
- Will the material be cut, sawed, grinded, sanded drilled, broken, removed, replaced or otherwise disturbed?

Asbestos Limits in the Air

Air monitoring equipment on a worker

Asbestos Permissible Exposure Limits (PEL)

- 0.1 fibers per cubic centimeter of air (0.1 f/cc) 8-hour time weighted average
- 1.0 f/cc 30-minute short-term exposure limit

Asbestos in the air at these levels would be invisible to the naked eye.

Construction/Maintenance Activities

Asbestos training certification of workers is required when asbestos levels in the air are above the PELs

Required for removal or encapsulation of any materials containing 1% asbestos or more.

Covers contractors, supervisors, workers depending on type/size of work.

Additional training may be required depending on type/size of work.

Asbestos abatement area contained and enclosed

Custodial/Light Maintenance Work

Housekeeping and building maintenance activities may expose workers to asbestos fibers if ACM/PACM is disturbed.

Activities of concern:

- sweeping
- vacuuming
- cleaning
- changing lights

Damaged asbestos pipe insulation

Asbestos debris on floor

Materials of concern:

- vinyl asbestos tile
- popcorn ceiling
- exposed piping
- exposed fireproofing

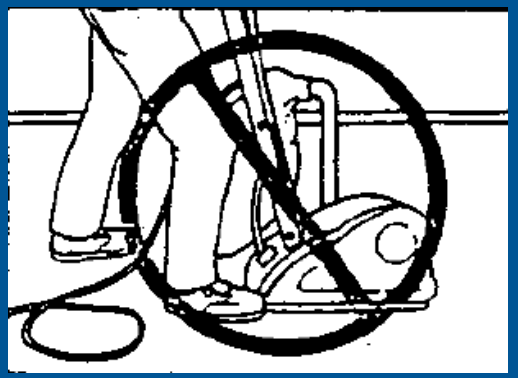
Custodial/Light Maintenance Work

Disturb ACM when replacing light bulbs, etc.

Dry dust or sweep surfaces, ceilings, walls, or floors

DO NOT:

Pin or hang pictures, plants, or objects on walls or from ceilings covered with asbestos materials



Sand asbestos floor tiles or backing material

Custodial/Light Maintenance Work

Use only a HEPA-filtered vacuum to clean up asbestos debris

DO:

Dust with a damp cloth

Wet mop floors

Specific Requirements for Other Work

Automotive brake and clutch inspection, disassembly, repair, and assembly operations

Roofing, flooring, siding and gaskets

Custodial/Light maintenance

Employees who perform housekeeping activities during and after construction activities are covered by asbestos construction work requirements.

Now, let's review the:

Quileute Tribal School

Asbestos

Management Plan

QUESTIONS:

- **Do you know if your School has ACBMs (Asbestos Containing Building Materials)?**
- **Who would you report ACBM damage to?**
- **Where is the Asbestos Management Plan for this school?**

Washington (WA) Department of Occupational Safety and Health – asbestos webpage

OSHA – asbestos webpage

Environmental Protection Agency – asbestos webpage

WA Department of Ecology – asbestos waste webpage

Thank You!

Have a Safe Day.