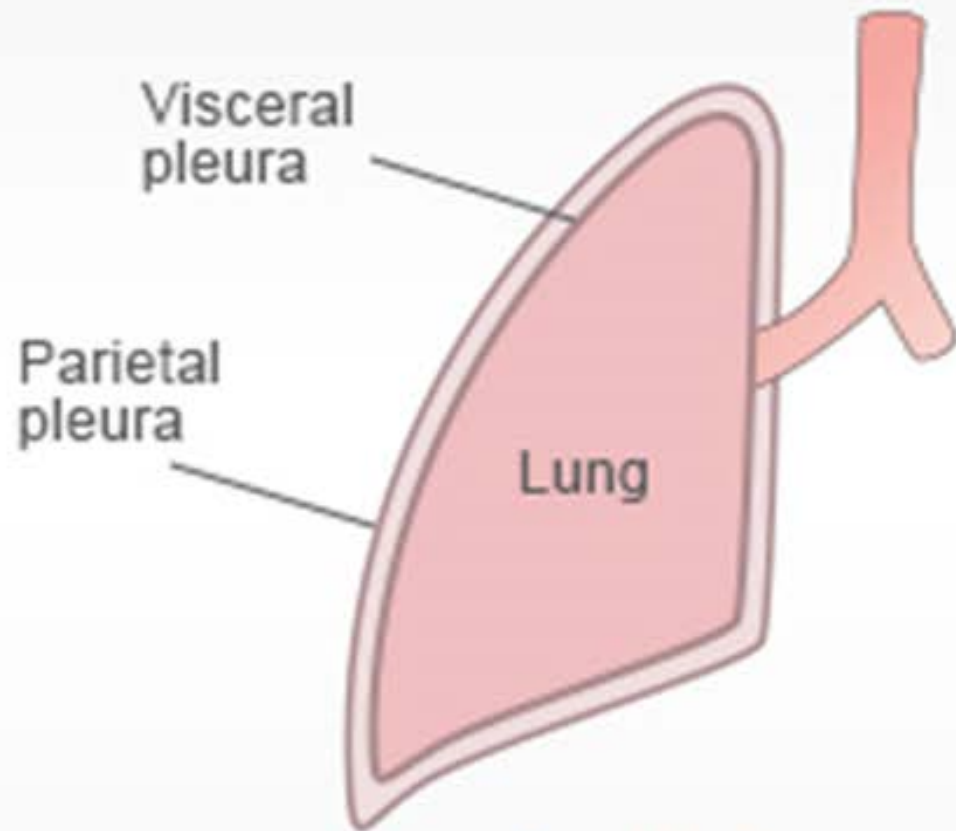


ARTHUR PUTT

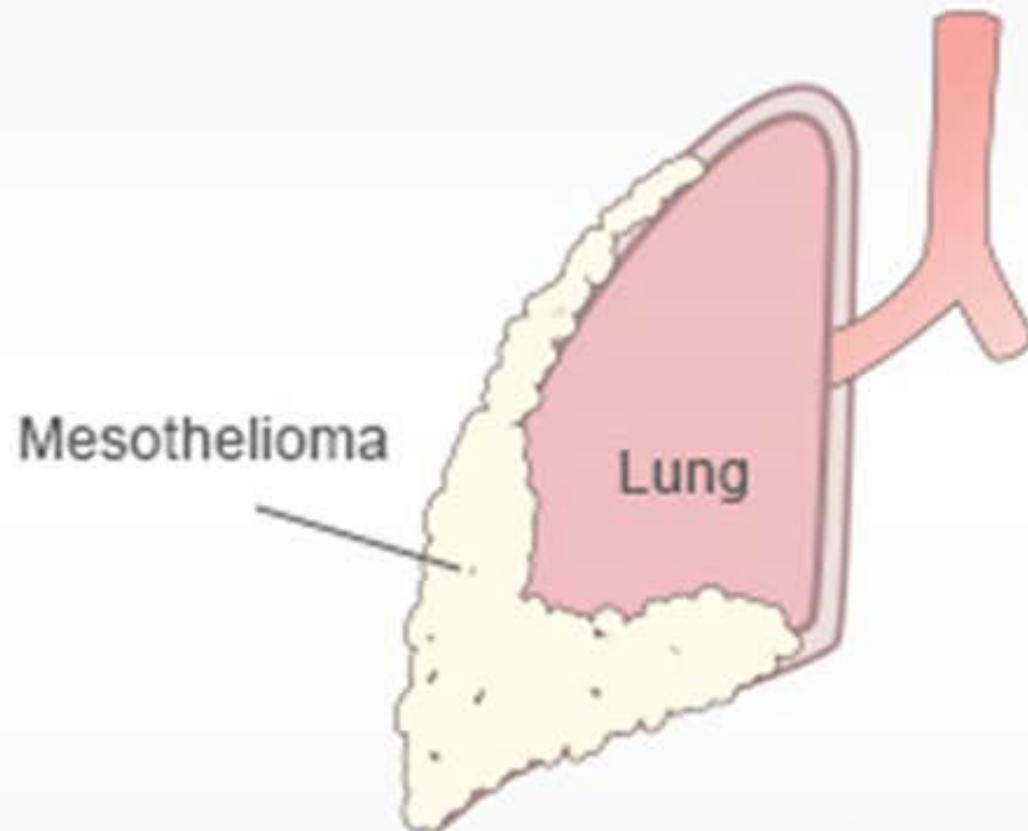
Born February 12, 1939



CHOICES



Healthy lung



Diseased lung

Arthur Putt



BURDEN OF PROOF



BURDEN OF PROOF



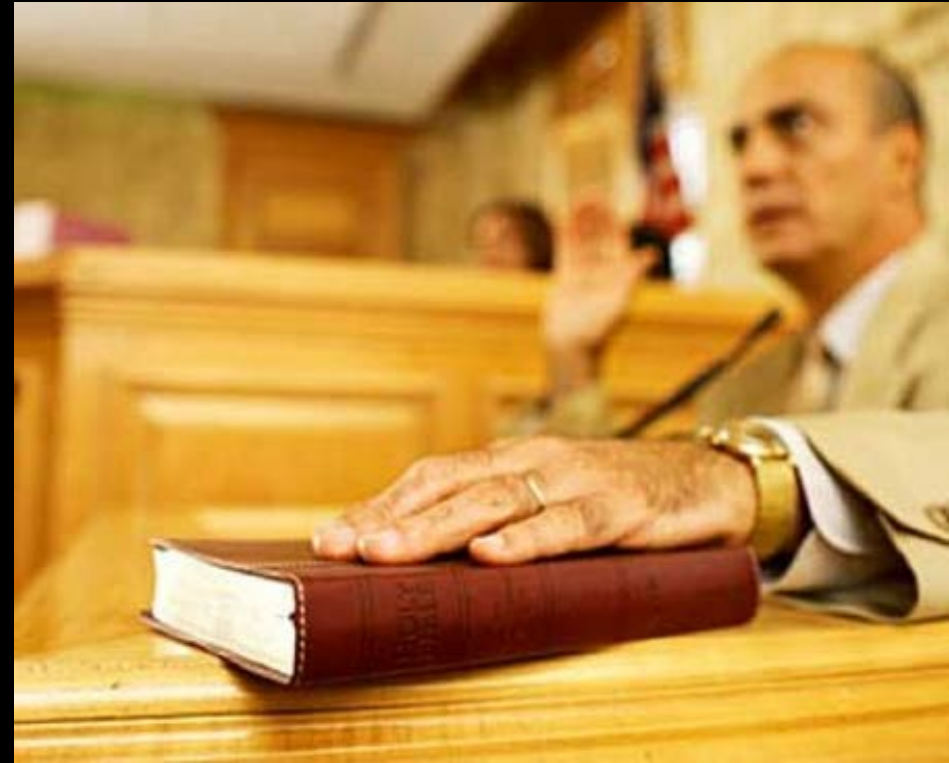
More likely than not!!!!!!

EVIDENCE

- 1. EXPOSURE TO ASBESTOS**
- 2. ASBESTOS DISEASE**
- 3. REASONS MR. PUTT HAS MESOTHELIOMA**
- 4. ASBESTOS CANCER EFFECTS**



EVIDENCE:





Dr. Arnold Brody



Dr. Richard Cohen



Christopher DePasquale, MPH,
CIH



Dr. Barry Horn



Dr. James Millette,
Ph.D., D-IBFES



Dr. Allen Smith,
M.D. PhD

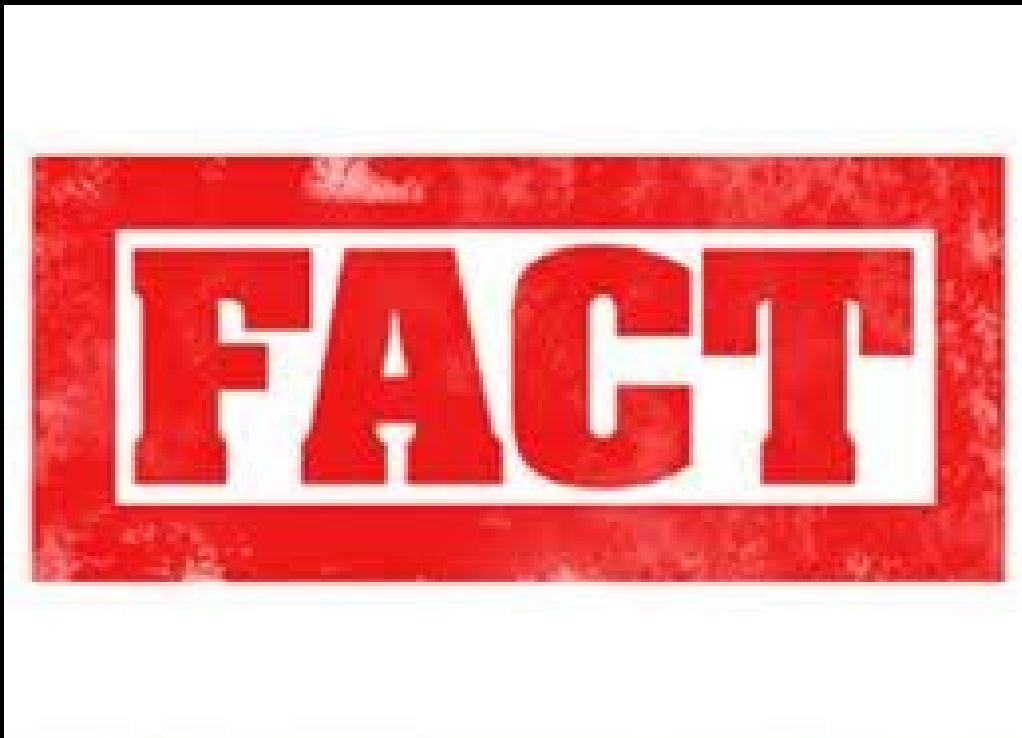


Robert Johnson



EVIDENCE: FACT WITNESSES

- **Arthur Putt**
- Family members
- **Corporate representatives**



EVIDENCE

- 1. EXPOSURE TO ASBESTOS**
- 2. ASBESTOS DISEASE**
- 3. REASONS MR. PUTT HAS MESOTHELIOMA**
- 4. ASBESTOS CANCER EFFECTS**

1. EXPOSURE TO ASBESTOS

**WAS THE PLAINTIFF
EXPOSED
TO ASBESTOS
FROM THE
DEFENDANTS' PRODUCTS?**

WHAT IS ASBESTOS?



A TOXIN

A MICROSCOPIC MINERAL FIBER

THAT CAUSES

**CANCER AND LUNG SCARRING
("FIBROSIS")**

BARRY HORN, M.D.



Board Certifications

American Board of Internal Medicine
Pulmonary Disease Subspecialty Board
NIOSH as a Government Certified B Reader

Professional Memberships

American Thoracic Society
American College of Chest physicians
California Medical Association
Alameda-Contra Costa Country Medical Association
California Thoracic Society

ALLAN H. SMITH, M.D., PhD

Current Appointments

Professor Emeritus of Epidemiology, School of Public Health,
University of California, Berkley (continued research program)
Associate Director Arsenic Health Effects Research Program,
continuing research projects in Chile, India and Bangladesh

Education

B.Sc. Victoria University of Wellington, New Zealand

Major: Mathematics, Minor: Chemistry

B.Med.Sc. University of Otago, New Zealand

Thesis: Stochastic models in general practice

M.B., Ch.B. University of Otago, New Zealand

Equivalent of M.D. in the U.S.

Ph.D. University of Otago, New Zealand

Thesis: The application of stochastic models in chronic
disease epidemiology



INDUSTRIAL HYGIENE, CONCEPTS, PRODUCT TESTING

Dr. Millette, Ph.D., D-IBFES



- McCrone Environmental Services
- MVA Scientific Consultant
- Board Certified by the International Board of Forensic Engineering Sciences
- Fellow – ASTM International
- Fellow – American Academy of Forensic Sciences
- Snider Lifetime Achievement Award from Environmental Information Association
- Published over 60 scientific publications in peer-reviewed journals, co-authored book on Asbestos Dust
- Served on professional panels for Government agencies

CHRISTOPHER DEPASQUALE, MPH, CIH

Compass Environmental, Inc., Senior Industrial Hygienist

Certifications

American Board of Industrial Hygiene, Certified Industrial Hygienist
Inspector pursuant to USEPA Asbestos Hazard Emergency
Management Planner, pursuant to USEPA AHERA regulations
Risk Assessor, Lead-Based Paint Activities in Housing and
Child-Occupied Facilities

Memberships

AIHA
American Industrial Hygiene Association, Georgia Local Section
The American Society for Testing and Materials (ASTM)



MINERAL FIBER



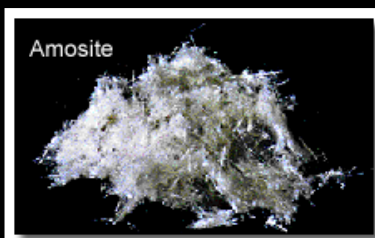
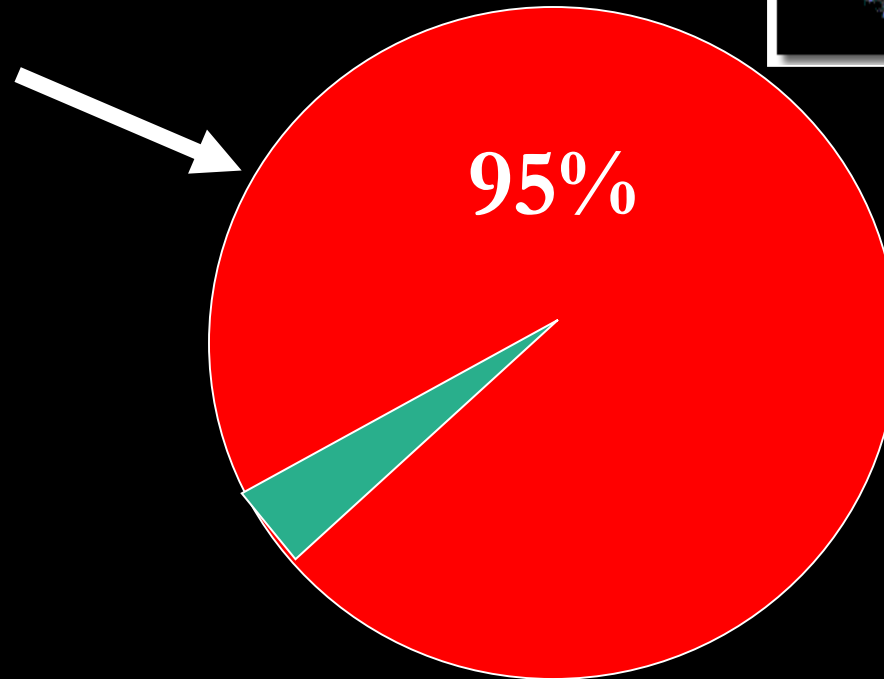
- Asbestos is a naturally occurring **mineral fiber** that has been used in more than **3,000** different construction materials and manufactured products

TYPES OF ASBESTOS

- SERPENTINE
CHRYBOTILE

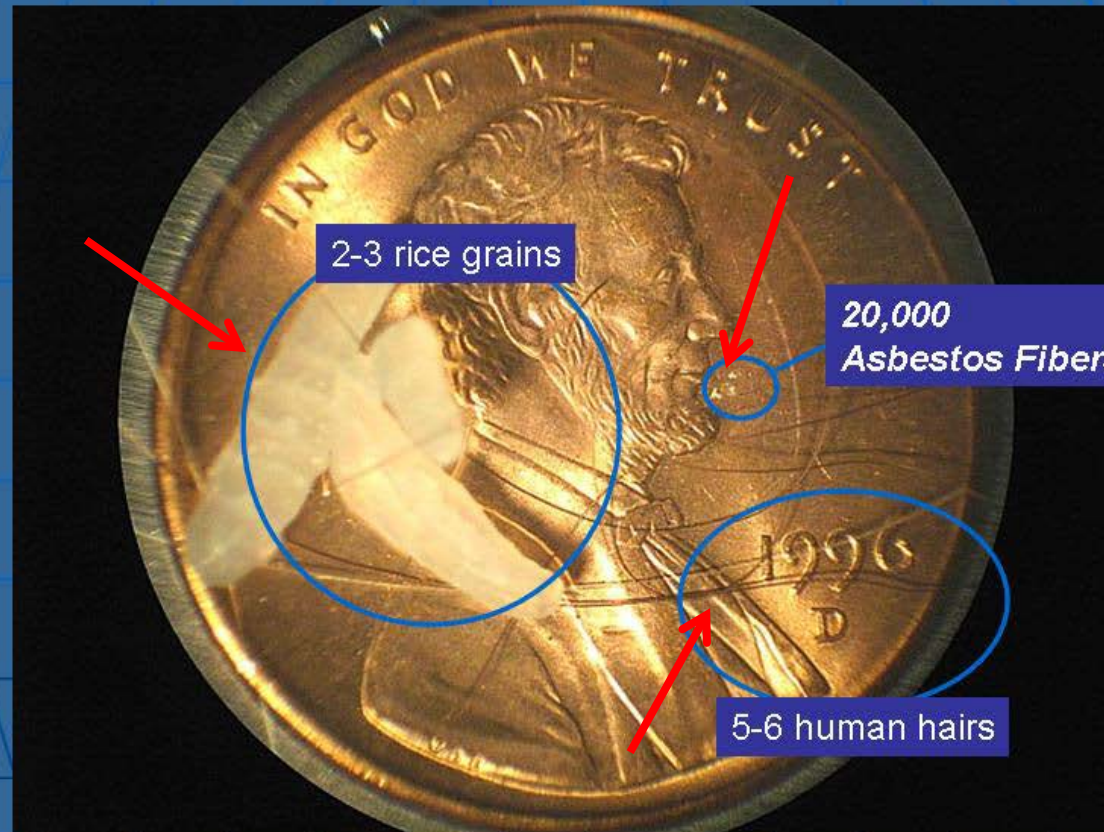


- AMPHIBOLE
AMOSITE
CROCIDOLITE
TREMOLITE

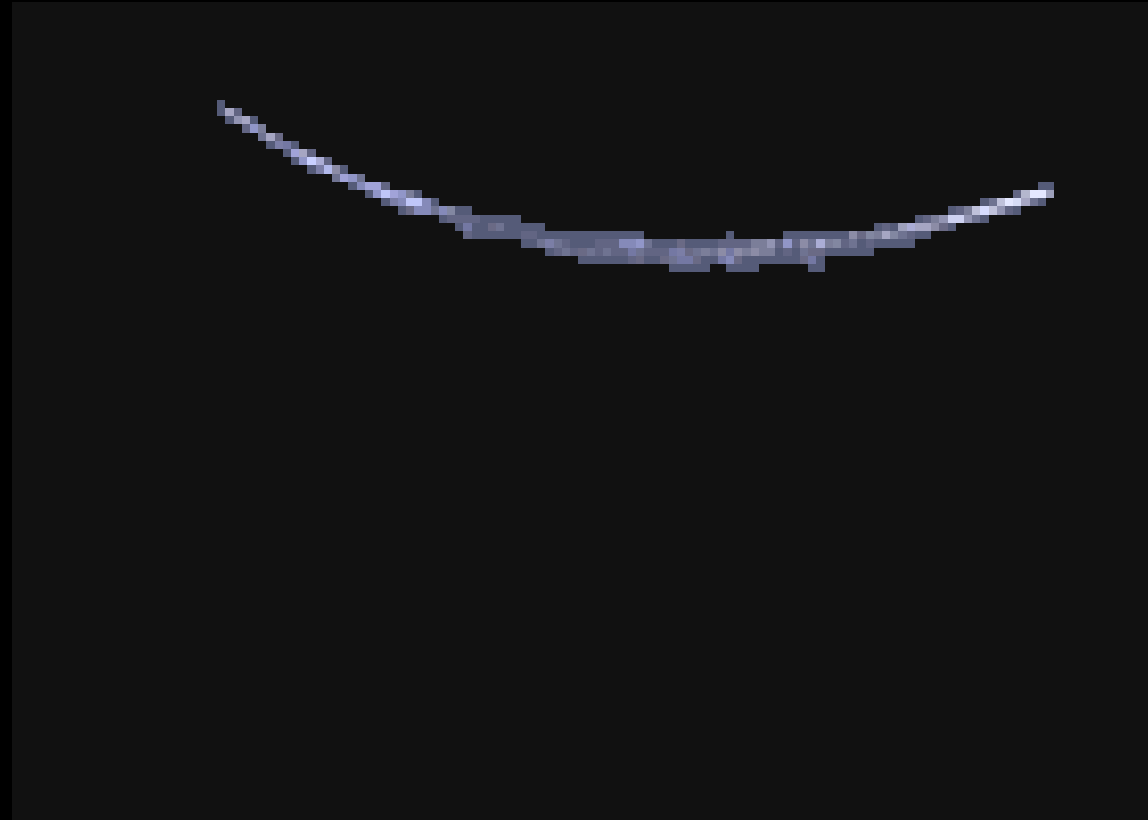


MICROSCOPIC ASBESTOS

How small is asbestos?



AERODYNAMIC

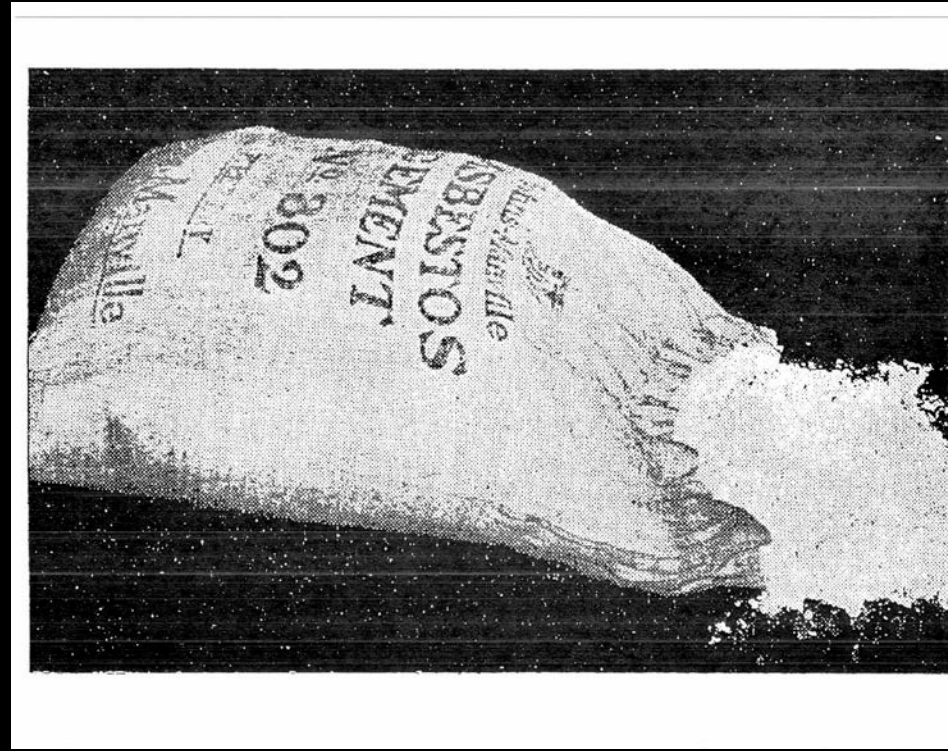


NO "ONION" PROPERTIES



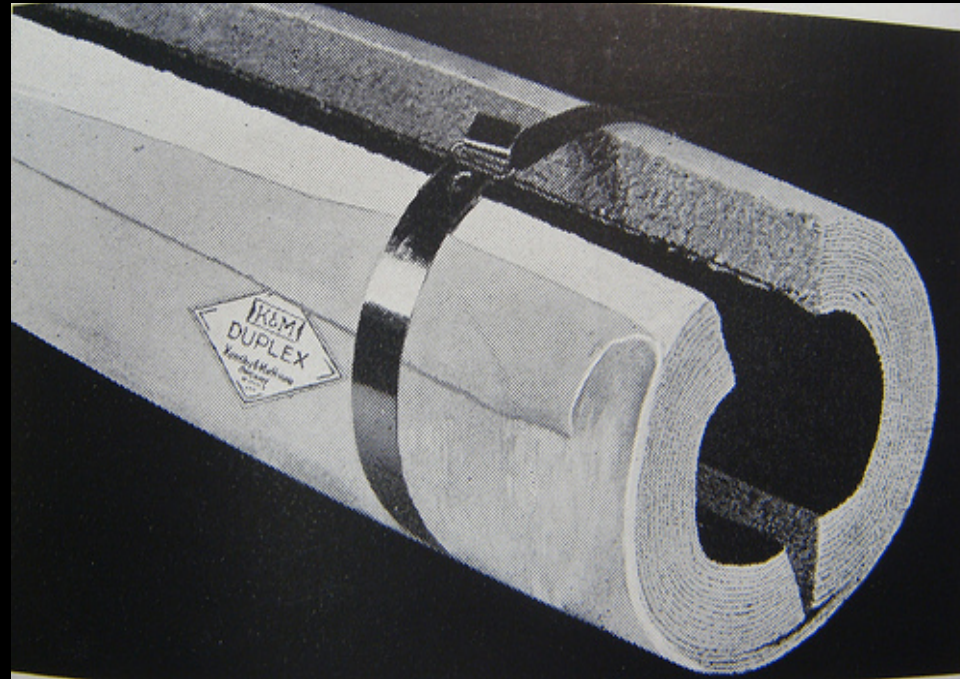
ASBESTOS PRODUCTS

ASBESTOS CEMENT



ASBESTOS PRODUCTS

ASBESTOS PIPECOVERING



ASBESTOS PRODUCTS

VALVES OR PUMPS WITH ASBESTOS GASKETS/
INSIDE AND/OR ASBESTOS INSULATION PACKING



ASBESTOS PRODUCTS

ASBESTOS GASKETS



ASBESTOS PRODUCTS

ASBESTOS JOINT COMPOUND



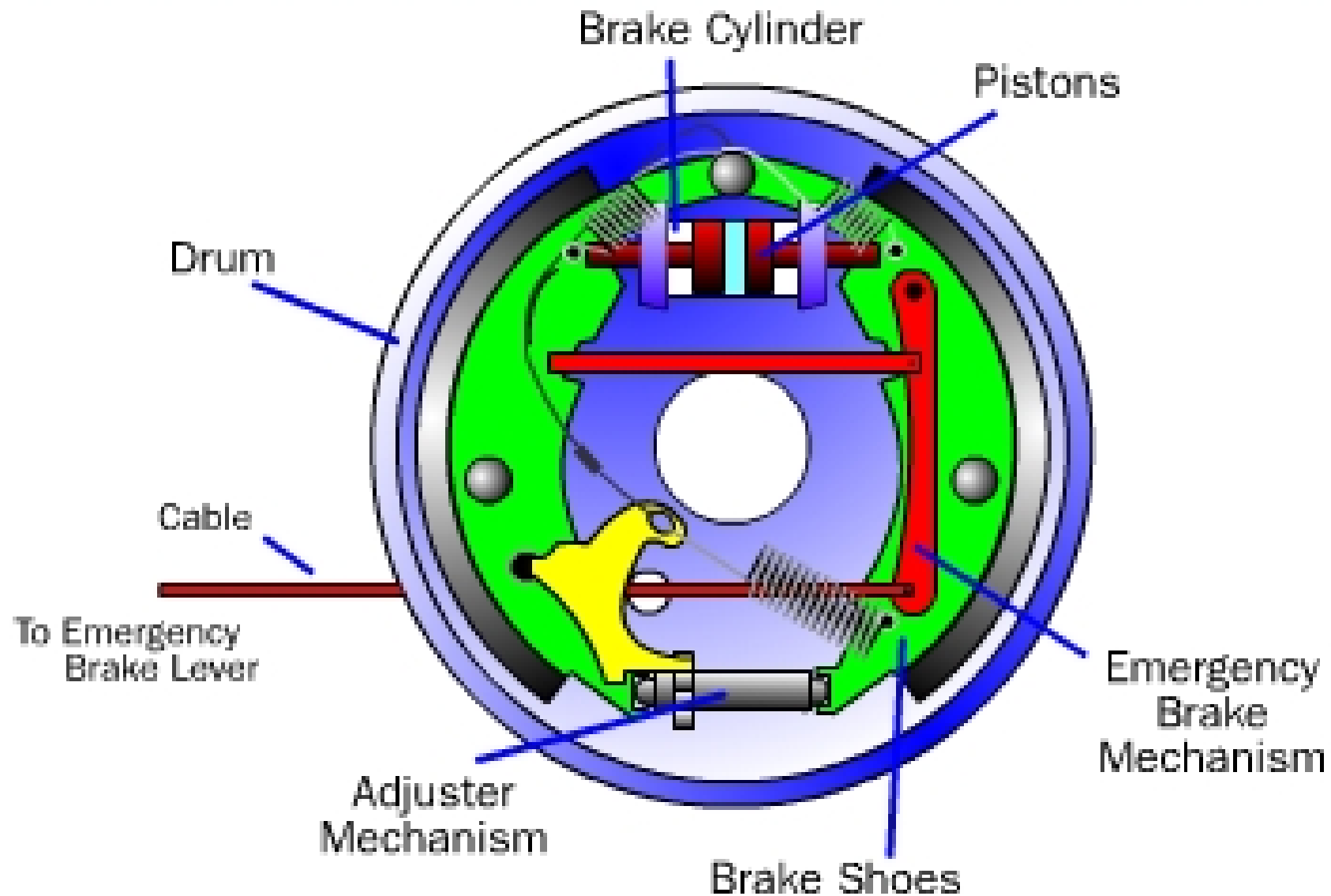
THE ONLY THING THAT MR.
PUTT WAS EXPOSED TO IN HIS
LIFETIME WAS

ASBESTOS PRODUCTS

ASBESTOS BRAKES



Drum Brake



HOW DID THE DEFENDANTS' ASBESTOS BRAKES EXPOSE ARTHUR PUTT TO ASBESTOS DUST?



EVIDENCE

1. EXPOSURE TO ASBESTOS
2. **ASBESTOS DISEASE**
3. REASONS MR. PUTT HAS MESOTHELIOMA
4. ASBESTOS CANCER EFFECTS
5. PUNITIVE DAMAGES

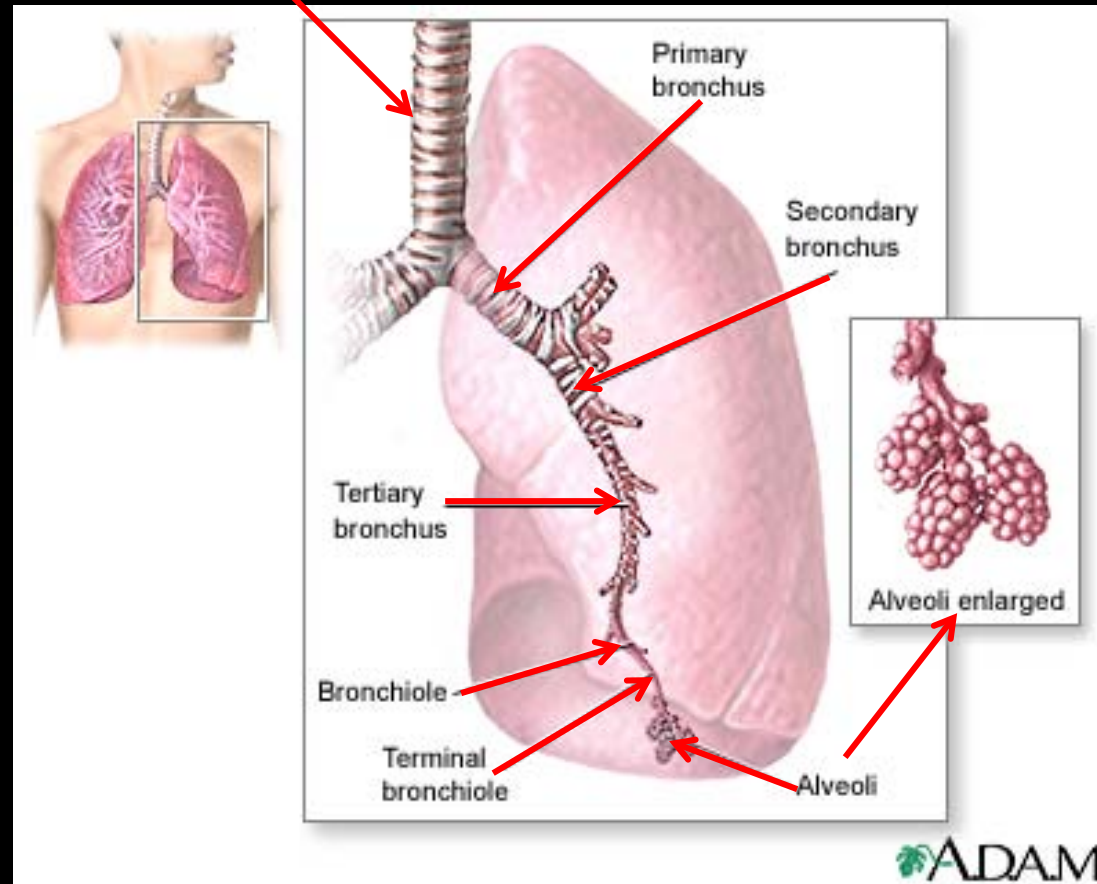
ASBESTOS DISEASE



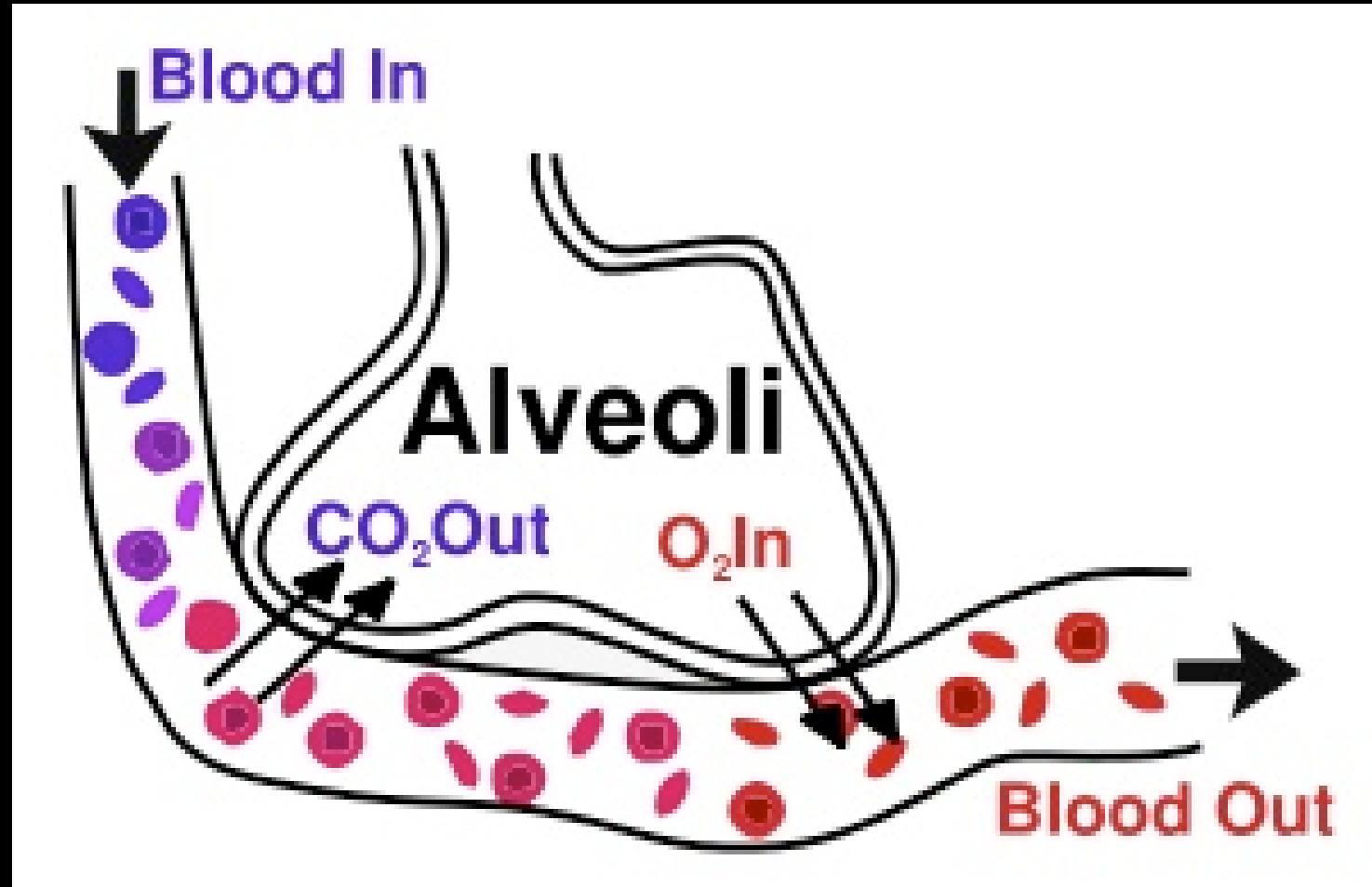
THE RESPIRATORY SYSTEM



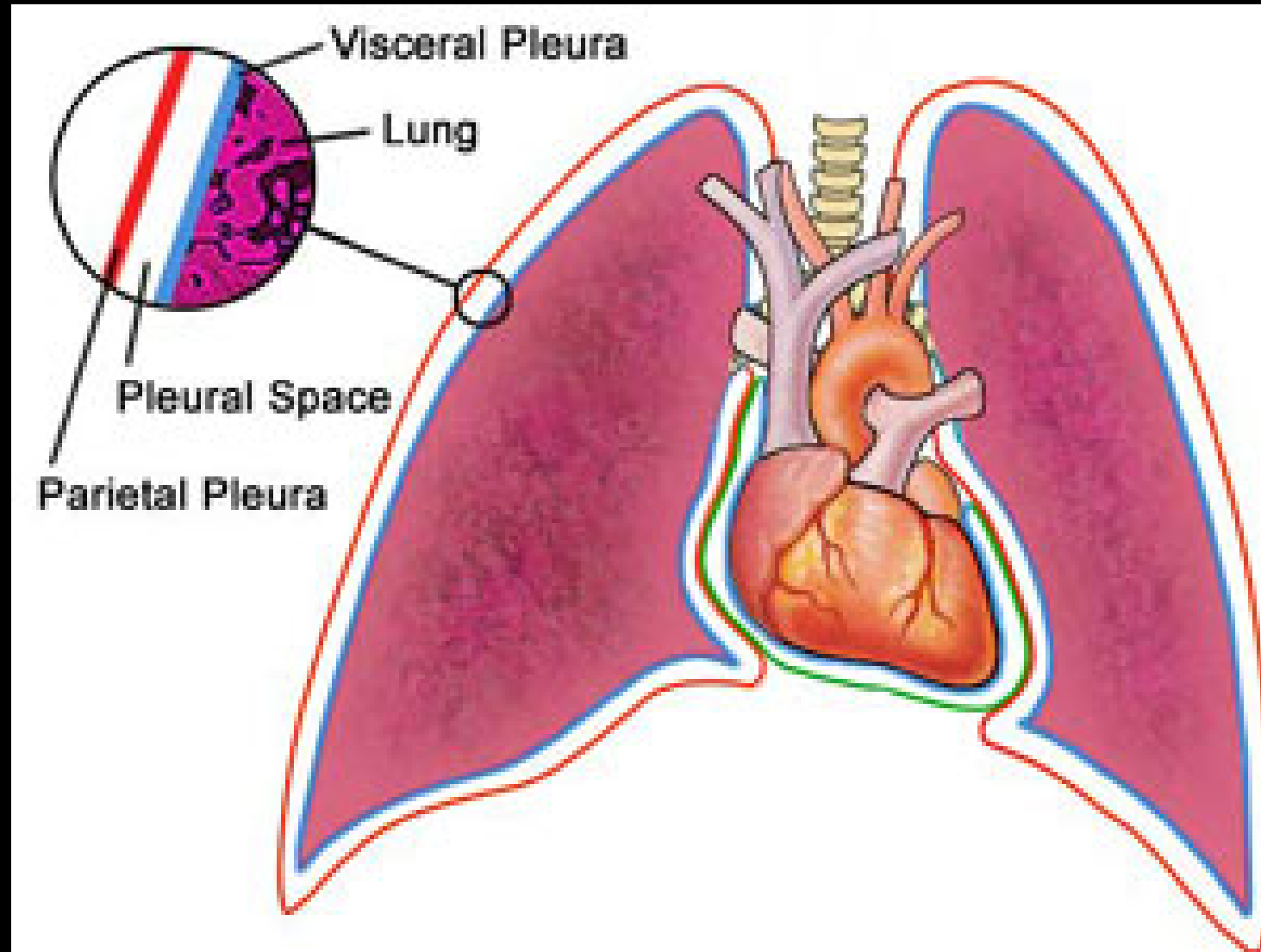
THE RESPIRATORY SYSTEM



THE RESPIRATORY SYSTEM



THE RESPIRATORY SYSTEM



ASBESTOS DISEASE

**ASBESTOS IS A WELL KNOWN, WELL
RECOGNIZED HUMAN CARCINOGEN**

ASBESTOS IS A TOXIC SUBSTANCE

ASBESTOS IS A POISON

ASBESTOS DISEASE

- NON-CANCER
(NON-MALIGNANT):
FIBROSIS (SCARRING)
ASBESTOSIS
PLEURAL PLAQUES

ASBESTOS DISEASE

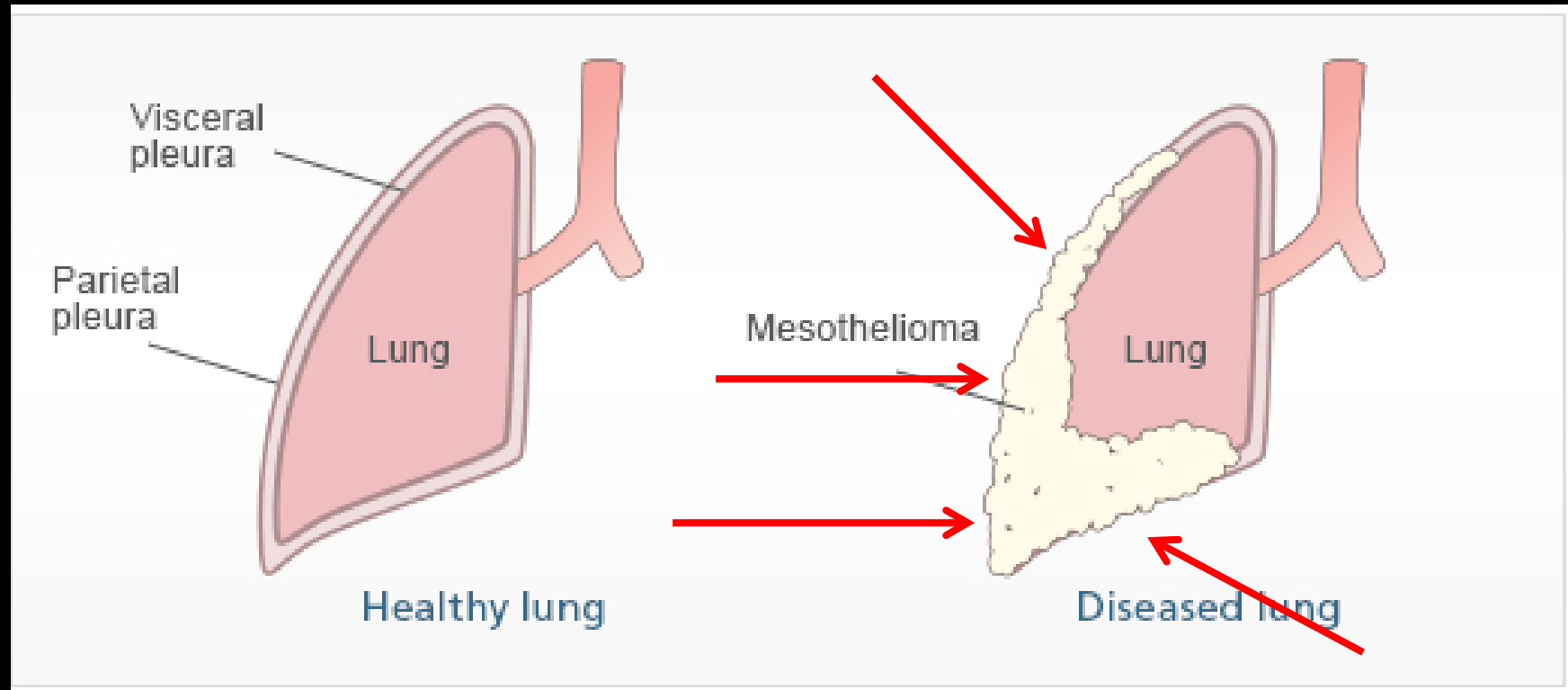
- CANCER (MALIGNANT): CARCINOMA
CARCINOGENIC

NEOPLASIA

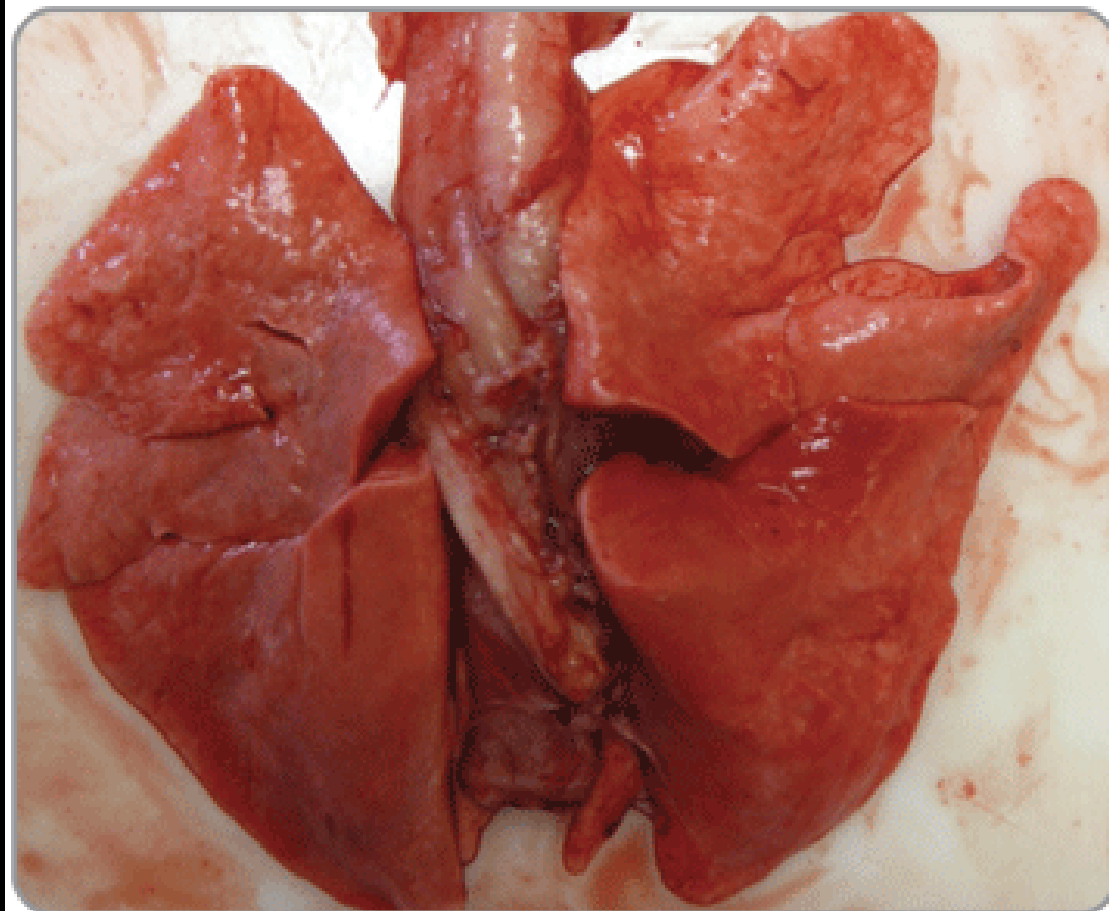
LUNG CANCER

MESOTHELIOMA

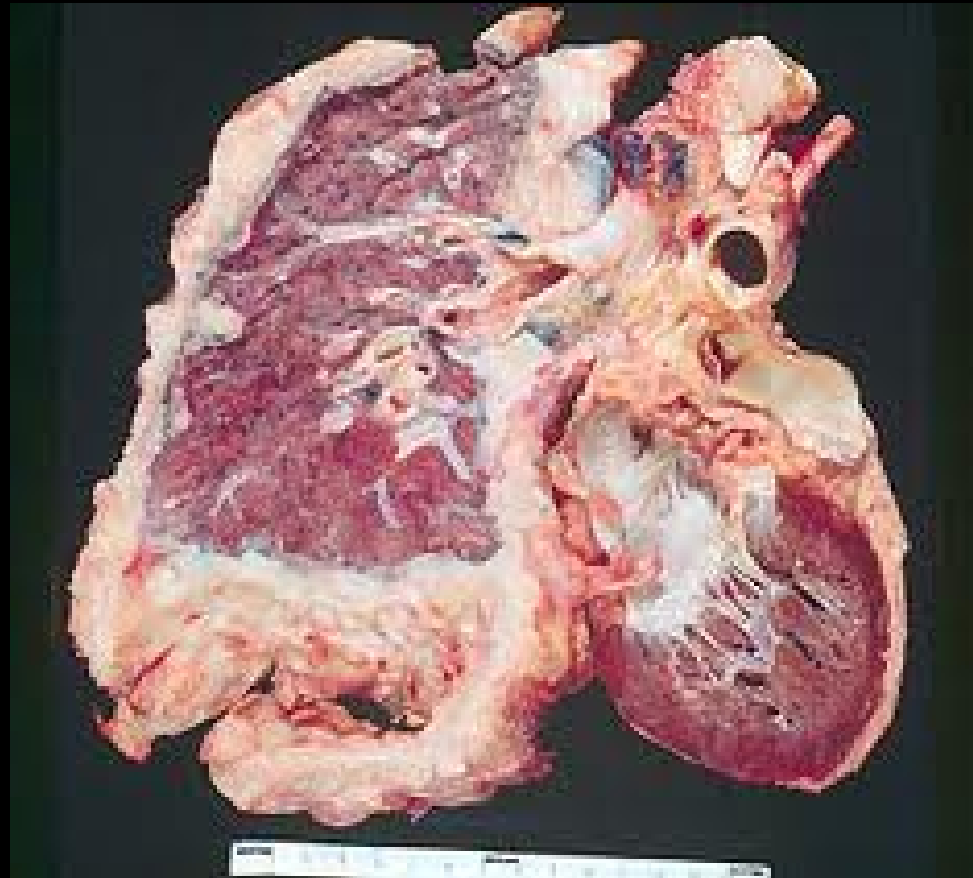
MESOTHELIOMA



HEALTHY



MESOTHELIOMA



ASBESTOS DISEASE

MEDICAL CONCEPTS

LATENCY

INDIVIDUAL SUSCEPTIBILITY

CUMULATIVE EXPOSURE

DOSE RESPONSE/RISK

NO SAFE LEVEL OF EXPOSURE

LATENCY

SATURDAY NIGHT



LATENCY

MONDAY MORNING



2 DAY LATENCY

EXPOSURE



DISEASE



ASBESTOS LATENCY

MESOTHELIOMA: 30-40/50+ YEARS

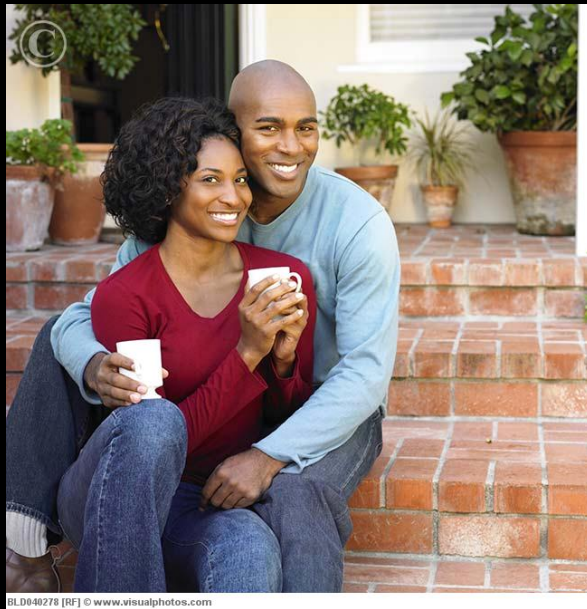
LUNG CANCER: 20-30 YEARS

ASBESTOSIS: 15-20 YEARS

INDIVIDUAL SUSCEPTIBILITY



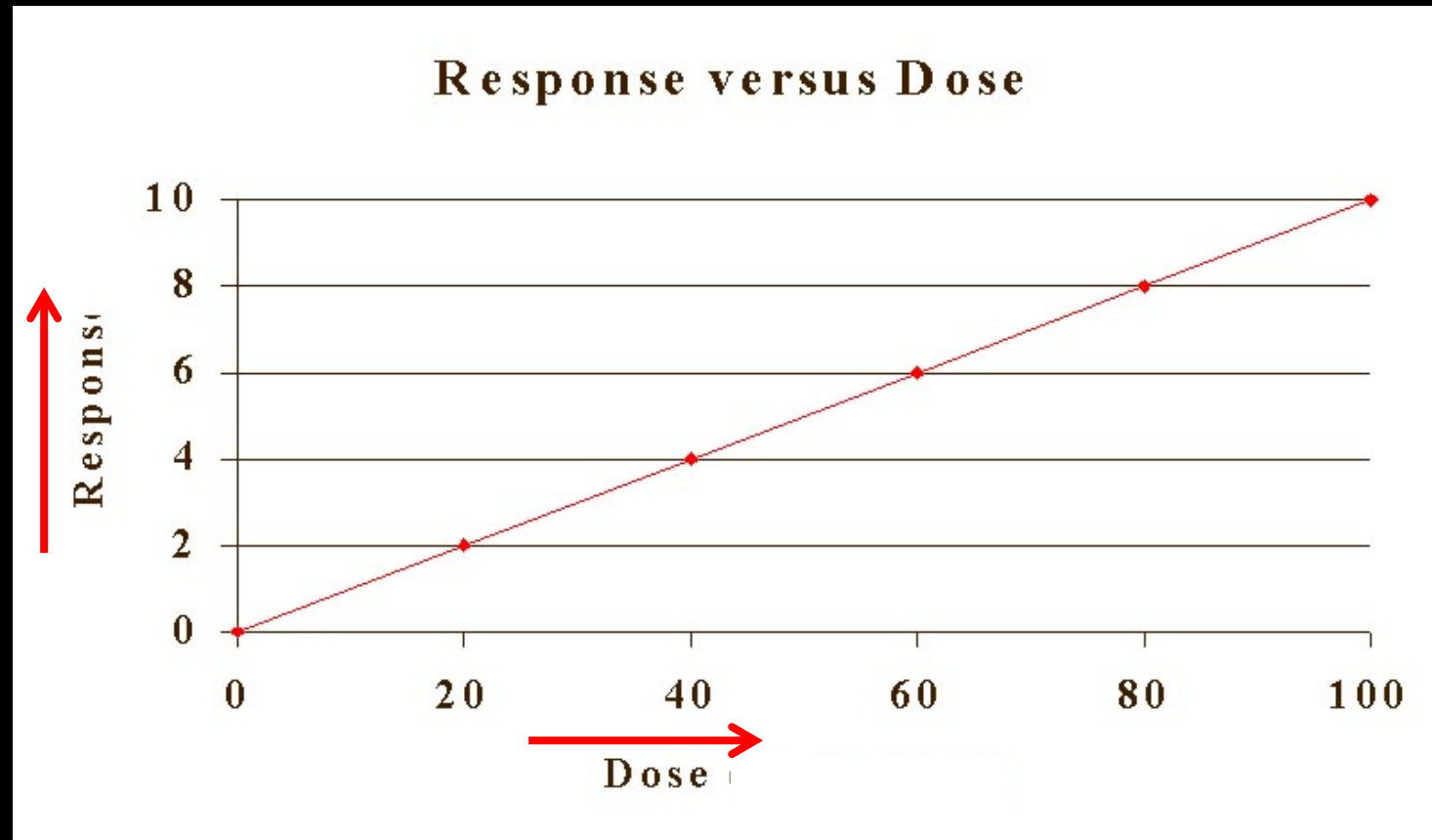
INDIVIDUAL SUSCEPTIBILITY



CUMULATIVE EXPOSURE



DOSE RESPONSE



ASBESTOS DISEASE

MEDICAL CONCEPTS

LATENCY

INDIVIDUAL SUSCEPTIBILITY

CUMULATIVE EXPOSURE

DOSE RESPONSE/RISK

NO SAFE LEVEL OF EXPOSURE

Government Agencies ALL Recognize NO SAFE LEVEL OF EXPOSURE



AMERICAN CANCER SOCIETY



WORLD HEALTH ORGANIZATION (WHO)



ENVIRONMENTAL PROTECTION AGENCY (EPA)



WORLD TRADE ORGANIZATION (WTO)



NATIONAL INSTITUTE FOR OCCUPATIONAL

SAFETY AND HEALTH (NIOSH)



US DEPT. OF LABOR – OCCUPATIONAL

SAFETY AND HEALTH ADMINISTRATION (OSHA)



US SURGEON GENERAL

NATIONAL ACADEMY OF SCIENCES



US CONSUMER PRODUCTS SAFETY COMMISSION



INTERNATIONAL PROGRAM ON SAFETY

INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC)

Chrysotile Asbestos Causes Mesothelioma



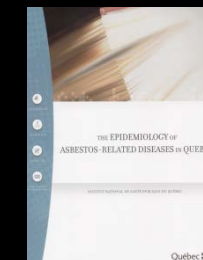
Surgeon General of the United States



WHO



EPA



Government of Quebec



ALL ASBESTOS FIBER TYPES CAUSE MESO



ALL FIBER TYPES CAUSE DISEASE

AMERICAN CANCER SOCIETY



WORLD HEALTH ORGANIZATION (WHO)



ENVIRONMENTAL PROTECTION AGENCY (EPA)

WORLD TRADE ORGANIZATION (WTO)



NATIONAL INSTITUTE FOR OCCUPATIONAL



SAFETY AND HEALTH (NIOSH)

US DEPT. OF LABOR – OCCUPATIONAL



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INTERNATIONAL PROGRAM ON SAFETY



INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC)

Asbestos & Mesothelioma

=

Only Accepted Cause in U.S.

“Signal Tumor”

Asbestos Exposure during Brake Lining Maintenance and Repair¹

ARTHUR N. ROHL, ARTHUR M. LANGER, MARY S. WOLFF, AND IRVING WEISMAN

Environmental Sciences Laboratory, Mount Sinai School of Medicine of the City University of New York, New York, New York 10029

Received December 1, 1975

Data obtained on asbestos exposure of garage mechanics during brake lining maintenance and repair work show that fiber concentrations frequently in excess of regulated limits are common. The presence of chrysotile, ranging from 2 to 15% in brake drum dusts, was demonstrated by X-ray diffraction, transmission electron microscopy, selected area electron diffraction, and electron microprobe analyses. Unaltered chrysotile was found, both as fiber and fibril form, in air and brake drum dust samples. The chrysotile asbestos content of personal air samples, taken during automobile brake repair work, was measured both by optical and electron microscopic techniques. While a positive correlation exists between the types of measurements, the present technique of optically counting asbestos fibers may considerably underestimate the levels of total asbestos exposure.

INTRODUCTION

During the past decade, significant disease risk has been found associated with the inhalation of asbestos fibers in a number of occupational and environmental circumstances other than in asbestos mining, milling and manufacturing, where serious hazard was already known (Wagner *et al.*, 1960; Newhouse and Thompson, 1965; Selikoff *et al.*, 1964, 1965; Harries, 1968).

Such exposures were found in the construction industry and in shipbuilding, as well as in other industrial settings where asbestos products were used. More recently, asbestos exposure has been suggested to occur during automotive brake lining repair and installation work, and measurable concentrations of asbestos fiber were observed in the work environment of workmen involved in these operations (Hickish and Knight, 1970; Hatch, 1970; Boillat and Lob, 1973). With limited data available, however, uncertainty remained regarding the type and extent of asbestos exposure during this work. Some investigators have questioned whether free asbestos fibers survive the high temperatures produced during braking action (Lynch, 1968; Hickish and Knight, 1970; Hatch, 1970) contending that asbestos decomposes as a result of the high point contact temperatures produced at the interface of the brake drum or disc and brake lining.

We have sought to obtain information concerning asbestos exposure of workmen engaged in brake lining maintenance and brake shoe installation, by analysis of residual dusts recovered from brake linings and by direct measurement of the

¹ This research was supported by Center Grant ES 00928 of the National Institute of Environmental Health Sciences of the U.S. Department of Health, Education and Welfare. Assistance was also provided in part by the Health Research Council of the City of New York HRC U 2329 and by the Ford Motor Company.

Asbestos Exposure during Brake Lining Maintenance and Repair¹

ARTHUR N. ROHL

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ASBESTOS CONCENTRATIONS DURING AUTOMOBILE BRAKE SERVICE^{1,2}

ASBESTOS EXPOSURE

TABLE 3
ASBESTOS CONCENTRATIONS DURING AUTOMOBILE BRAKE SERVICE^{1,2}

Operation	Distance (ft)	Number of samples	Fiber concentration (fibers/ml)	
			Mean	Range
Blowing dust out of brake drums with compressed air jet	3-5	4	16.0	6.6-29.8
	5-10	3	3.3	2.0-4.2
	10-20	2	2.6	0.4-4.8
Background samples taken at varying distance and lapsed times, after brake drum blowing	10	1	0.3	
	20	1	0.8	
	12	5	0.2	
	50	5	0.1	
	65	7	0.1	
Cleaning brake drums with dry brush	1-3	2	2.5	1.0-6.0
	12	3	0.1	0-0.2

¹ Fibers 5-100 µm in length, counted by optical microscopy.
² The new proposed Asbestos Standard of the U. S. Department of Labor records asbestos exposure in fibers/m³, noting that a workman might respire approximately 8 m³ of air per working day, retaining an unstated proportion of inhaled fibers. The above table omits reference to air content of fibers < 5 µm in length.

is then riveted onto a steel plate. Some of these operations are similar to those done during the manufacture of brake shoes. Table 4 summarizes the results of personal air sampling in the course of this work. During light grinding of truck brake shoes (Fig. 6), an average peak concentration of about 4 fibers/ml was found in the breathing zone of the operator. The data show that measurable fiber concentrations are found 25 ft or more away. At a distance of 25 ft, for example, a concentration of 1 fiber/ml (1,000,000 fibers/m³) was found. Much larger numbers of shorter fibers would simultaneously be inhaled. During the beveling of truck brake shoes on a grinding machine, very high concentrations of fibers were found in the vicinity of the operator. The average of five air samples was about 37 fibers/ml. Area samples, taken up to 30 ft away from this operation, demonstrated the presence of airborne fibers. It was of interest to note that, at the time of this sampling, from eight to 15 other garage mechanics were working within this



Operation	Distance (ft)	Number of samples	Fiber concentration (fibers/ml)	
			Mean	Range
Blowing dust out of brake drums with compressed air jet	3-5	4	16.0	6.6-29.8
	5-10	3	3.3	2.0-4.2
	10-20	2	2.6	0.4-4.8

If you work in a commercial automotive shop that performs work on no more than five brake or clutch jobs per week, OSHA regulations allow the following method instead:

Wet Wipe Method This method involves using a spray bottle or other device capable of delivering a fine mist of water, or amended water (water with a detergent), at low pressure to wet all brake and clutch parts. The brakes can then be wiped clean with a cloth.

As a home mechanic, what can I do to protect myself from asbestos exposure?

If you are not able to determine whether your brakes or clutch contain asbestos, you may want to consider having your brakes or clutch serviced at a commercial automotive shop. OSHA requires special work practices for professional automotive technicians. If, however, this is not possible and you do not have access to the equipment professional automotive shops use to comply with the OSHA work practices, you may want to consider using the wet wipe method described in this brochure (www.osha.gov/SLTC/asbestos/standards.html). This method has been deemed acceptable by OSHA for shops that service no more than five brake or clutch jobs per week.

Work Practice Don'ts for Home Mechanics: It is recommended that you:

- Do not use compressed air for cleaning. Compressed air blows dust into the air.
- Do not clean brakes or clutches with a dry rag, brush (wet or dry), or garden hose.
- Do not use an ordinary wet/dry vac without a high-efficiency particulate air (HEPA) filter to vacuum dust. Invisible particles of brake or clutch dust can stay in the air and on your clothes long after a job is complete.
- Avoid taking work clothing inside the home or tracking dust through the house after performing brake and clutch work to prevent exposing your family to dust particles that may contain asbestos.

Work Practice Do's for Home Mechanics: It is recommended that you:

- Use pre-ground, ready-to-install parts.
- If a brake or clutch lining must be drilled, grooved, cut, bevelled, or lathe-turned, use low speeds to keep down the amount of dust created.
- Use machinery with a local exhaust dust collection system equipped with HEPA filtration to prevent dust exposures and work area contamination.
- Change into clean clothes before going inside the home and wash soiled clothes separately.
- Minimize exposure to others by keeping bystanders, as well as food and drinks, away from the work area.

How do I dispose of waste that contains asbestos?

Employers of professional automotive technicians must ensure that they or their waste haulers dispose of waste that contains brake or clutch dust, including wet rags used to wipe this dust, in accordance with Federal and local regulations, including the OSHA asbestos waste disposal regulations. OSHA regulations (29 CFR 1910.1001(k)(6) and 29 CFR 1910.1001(j)(4)) require that, before waste containers with brake and clutch dust and other asbestos waste in them are collected, they must be sealed. The containers also must be impermeable and must be appropriately labeled. These regulations do not apply to home mechanics. For home mechanics, EPA recommends that asbestos waste be double-bagged and disposed of following appropriate local regulations to minimize exposure. You may contact your state asbestos representative for more disposal and other information.
<http://www.epa.gov/asbestos/pubs/statecontact.pdf>

Where can I get additional information?

OSHA has issued a Safety and Health Information Bulletin on brake and clutch repair that is available at <http://www.osha.gov/dts/shib/shib072606.html>. EPA's Asbestos Worker Protection Rule regulations apply to certain state and local government employees (40 CFR Part 763, Subpart G). For more information on EPA's Asbestos Program visit:

<http://www.epa.gov/asbestos/>
or call 202-554-1404.



Current Best Practices For Preventing Asbestos Exposure Among Brake and Clutch Repair Workers



March 2007

EPA-747-F-04-004

Who can this information help?

This information can help professional automotive technicians and home mechanics who repair and replace brakes and clutches. By law, most professional automotive shops must follow the Occupational Safety and Health Administration's (OSHA) regulations at 29 CFR 1910.1001, specifically paragraph (f)(3) and Appendix F. These are mandatory measures that employers must implement for automotive brake and clutch inspection, disassembly, repair, and assembly operations. State and local governments with employees who perform brake and clutch work in states without OSHA-approved plans must follow the identical regulations under the EPA Asbestos Worker Protection Rule (Subpart G of 40 CFR 763).

While home mechanics are not required to follow OSHA work practices (or the identical EPA Asbestos Worker Protection Rule), using these practices home mechanics can reduce their potential exposure to asbestos if it is present, thereby reduce their potential risk of asbestos-related diseases.

What is asbestos and how can it cause health problems?

Asbestos, a naturally occurring mineral fiber that is highly heat resistant, can cause serious health problems when inhaled into the lungs. If products containing asbestos are disturbed, asbestos fibers can be released into the air. Persons breathing the air may then inhale asbestos fibers. Continued exposure can increase the amount of fibers deposited in the lung. Fibers embedded in the lung tissue over time may result in lung diseases such as asbestosis, lung cancer, or mesothelioma. It can take from 10 to 40 years or more for symptoms of an asbestos-related condition to appear. Smoking increases the risk of developing illness from asbestos exposure.

For more information on the health effects of asbestos exposure, visit the Agency for Toxic Substances and Hazardous Waste Registry (ATSDR) at <http://www.atsdr.cdc.gov/asbestos/>

Why should mechanics be concerned about asbestos exposure?

Because some, but not all, automotive brakes and clutches available or in use today may contain asbestos, professional automotive technicians and home mechanics who repair and replace brakes and clutches may be exposed to asbestos dust. Brake and clutch dust can be seen when a brake disk, drum, clutch cover, or the wheel is removed from a car, truck, or other equipment. There are also many small dust particles that cannot be seen with the eye. If the brakes contain asbestos, the dust may contain asbestos.

How do I know if I have asbestos brake or clutch components?

You cannot tell whether brake or clutch components contain asbestos simply by looking at them. For newer vehicles and parts, auto manufacturers, auto parts retailers and packaging information, such as labels or Material Safety Data Sheets, may be able to tell you whether or not your brake or clutch components contain asbestos. For older vehicles, or vehicles that have had brakes replaced, you may not be able to easily find out if the brake or clutch components contain asbestos.

What is asbestos and how can it cause health problems?

Asbestos, a naturally occurring mineral fiber that is highly heat resistant, can cause serious health problems when inhaled into the lungs. If products containing asbestos are disturbed, thin, lightweight asbestos fibers can be released into the air. Persons breathing the air may then inhale asbestos fibers. Continued exposure can increase the amount of fibers deposited in the lung. Fibers embedded in the lung tissue over time may result in lung diseases such as asbestosis, lung cancer, or mesothelioma. It can take from 10 to 40 years or more for symptoms of an asbestos-related condition to appear. Smoking increases the risk of developing illness from asbestos exposure.



Using compressed air, a brush (wet or dry), or a dry rag to clean brake assemblies has the potential to expose you to asbestos fibers.

Asbestos brake shoes cannot be cleaned with a non-tilt brush. If a shoe is a non-tilt type, asbestos exposure may result.

Automotive shop practices must include asbestos control measures to reduce potential exposures

An automotive shop that performs five brake or clutch jobs must use one of the following methods or an equivalent method to control asbestos exposure.

Water/HEPA Vacuum System This method requires the use of a water and vacuum system to clean plastic walls or windows, brake or clutch assembly to

Wet Method This specially designed equipment wets down brake assemblies to reduce the runoff in a special container to prevent brake dust from spreading in

Who can this information help?

This information can help professional automotive technicians and home mechanics who repair and replace brakes and clutches. By law, most professional automotive shops must follow the Occupational Safety and Health Administration's (OSHA) regulations at 29 CFR 1910.1001, specifically paragraph (f)(3) and Appendix F. These are mandatory measures that employers must implement for automotive brake and clutch inspection, disassembly, repair, and assembly operations. State and local governments with employees who perform brake and clutch work in states without OSHA-approved state plans must follow the identical regulations found under the EPA Asbestos Worker Protection Rule (Subpart G of 40 CFR 763).

While home mechanics are not required to follow the OSHA work practices (or the identical requirements under the EPA Asbestos Worker Protection Rule), by using these practices home mechanics can minimize potential exposure to asbestos if it is present and thereby reduce their potential risk of developing any asbestos-related diseases.

What is asbestos and how can it cause health problems?

Asbestos, a naturally occurring mineral fiber that is highly heat resistant, can cause serious health problems when inhaled into the lungs. If products containing asbestos are disturbed, thin, lightweight asbestos fibers can be released into the air. Persons breathing the air may then inhale asbestos fibers. Continued exposure can increase the amount of fibers deposited in the lung. Fibers embedded in the lung tissue over time may result in lung diseases such as asbestosis, lung cancer, or mesothelioma. It can take from 10 to 40 years or more for symptoms of an asbestos-related condition to appear. Smoking increases the risk of developing illness from asbestos exposure.

For more information on the health effects of asbestos exposure, visit the Agency for Toxic Substances and Disease Registry (ATSDR) at <http://www.atsdr.cdc.gov/asbestos/index.html>.

Why should mechanics be concerned about asbestos exposure?

Because some, but not all, automotive brakes and clutches available or in use today may contain asbestos, professional automotive technicians and home mechanics who repair and replace brakes and clutches may be exposed to asbestos dust. Brake and clutch dust can be seen when a brake disk, drum, clutch cover, or the wheel is removed from a car, truck, or other equipment. There are also many small dust particles that cannot be seen with the eye. If the brakes contain asbestos, the dust may contain asbestos fibers, which could be inhaled.

Do not blow dust from brakes and clutches!



Using compressed air, a brush (wet or dry), or a dry rag to clean brake assemblies has the potential to expose you to asbestos fibers.

How do I know if I have asbestos brake or clutch components?

You cannot tell whether brake or clutch components contain asbestos simply by looking at them. For newer vehicles and parts, auto manufacturers, auto parts retailers and packaging information, such as labels or Material Safety Data Sheets, may be able to tell you whether or not your brake or clutch components contain asbestos. For older vehicles, or vehicles that have had brakes replaced, you may not be able to easily find out if the brake or clutch components contain asbestos.

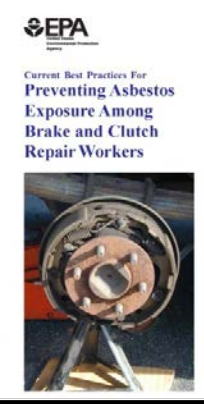
As a best practice, OSHA states that mechanics should assume that all brakes have asbestos-type shoes. Worn non-asbestos-type brake shoes cannot be readily distinguished from asbestos-type shoes. If a mechanic assumes incorrectly that a shoe is a non-asbestos type and fails to utilize brake dust control procedures, increased asbestos exposure may result.

As a professional automotive technician, what work practices must I follow to reduce potential exposures to asbestos?

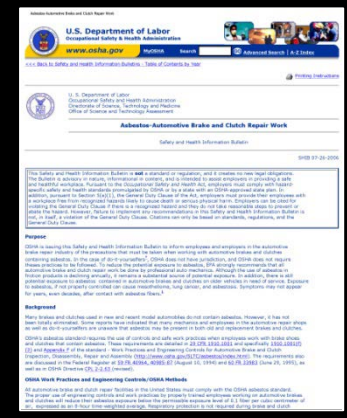
If you work in a commercial automotive shop that performs work on more than five brake or clutch jobs per week, OSHA regulations require the use of one of the following work practices or an equivalent method such as the spray can/solvent system.

Negative-Pressure Enclosure/HEPA Vacuum System Method This type of enclosure and vacuum system has a special box with clear plastic walls or windows, which fits tightly around a brake or clutch assembly to prevent asbestos exposure.

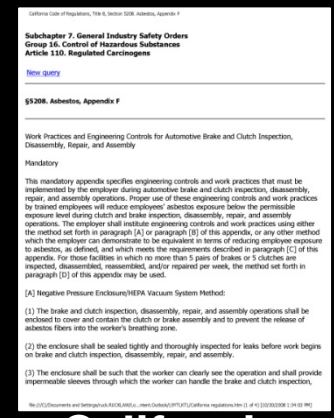
Low Pressure/Wet Cleaning Method This specially designed low-pressure spray equipment wets down the brake assembly and catches the runoff in a special basin to prevent airborne brake dust from spreading in the work area. (over)



EPA2007



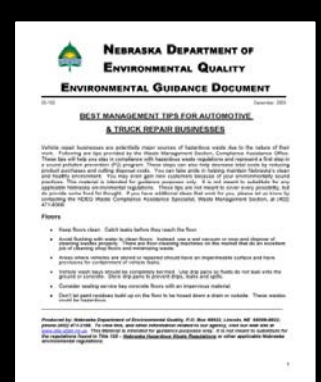
OSHA



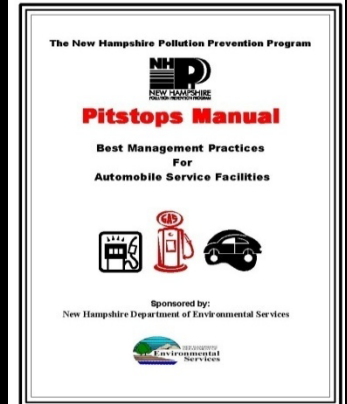
California



Minnesota



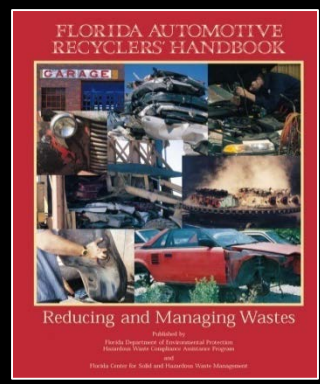
Nebraska



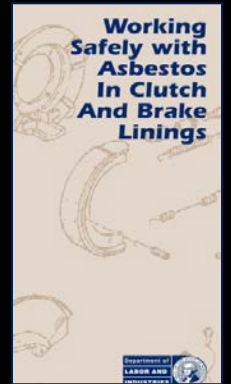
New Hampshire



New Jersey



Florida



Washington



Alberta



Chrysotile Institute

But what about “epidemiology?”



Specificity of these studies- what do they have to do with Arthur Putt?

Human Epidemiological Study	Brake Work?	Job Description?
		Garage
McDonald (1980)	Not Researched	mechanics & repairman, auto
Petersen & Milham (1980)	Not Researched	automobile repair
Teta et al. (1983)	Not Researched	motor vehicles
Olsen & Jensen (1987)	Not Researched	mechanic/car repair
Jarvholm & Brisman (1988)	Not Researched	auto mechanic
Hansen (1989)	Not Researched	bus garage workers
Gustavsson (1990)	Not Researched	motor vehicle repair workers
Woitowitz & Rodelsperger (1994)	Yes	motor mechanics
Coggon (1995)	Not Researched	brake lining installation & repair
Teschke, Checkoway et al. (1997)	Yes	mechanics, motor vehicles
Agudo (2000)	Not Researched	auto mechanics & repair workers
Milham & Ossiander (2001)	Not Researched	automobile mechanics
NIOSH (2002)	Not Researched	brake work
Hessell et al. (2004) / Spirtas (1985)	Yes	skilled auto mechanics
Rolland et al. (2005)	Not Researched	motor mechanics
McElvenny et al. (2005)	Not Researched	motor mechanics
Peto, Rake et al. (2009)	Not Researched	

EPIDEMIOLOGY

Only three studies actually looked at brakes:

- Woitowitz - Study is too weak to detect a real risk.
- Teschke - Study is too small.
- Hessell - Paper was paid for by Ford, GM & Chrysler.

Ford / Exponent / Chemrisk

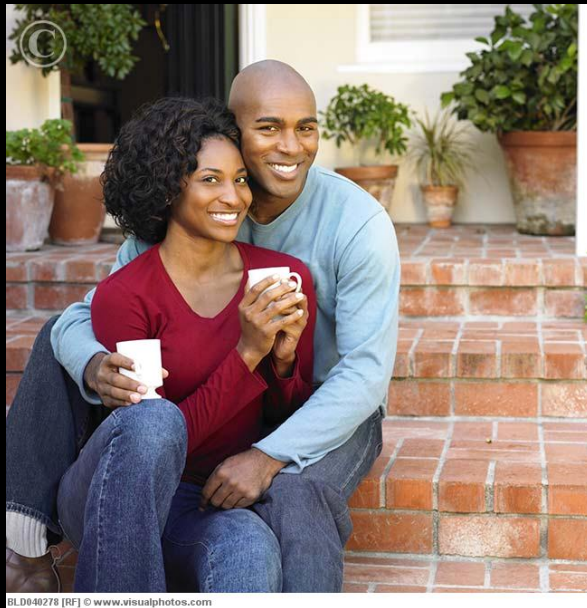
WORKERS AT FORD ITSELF

- EVIDENCE WILL SHOW AT A MINIMUM OVER 30 DEATHS AS A RESULT OF MESOTHELIOMA IN WORKERS FROM FORD FACILITIES

ARTHUR PUTT'S

“RISK”

No epidemiology takes INDIVIDUAL SUSCEPTIBILITY into account



BLD040278 [RF] © www.visualphotos.com





EVEN THIS ROCK IS “PREDISPOSED” TO FALL SOMEDAY,
IT IS ALSO “SUSCEPTIBLE” TO BEING PUSHED.

A FORCE OR PERSON THAT GIVES IT A PUSH
IS STILL A CAUSE OF THE FALL THAT ACTUALLY OCCURS...
NO MATTER WHAT THE RISK OF FALLING ON ITS OWN WAS.

What's the bottom line?

MESOTHELIOMA IS 100% PREVENTABLE

No dust = NO DISEASE



1. EXPOSURE TO ASBESTOS

**2. ASBESTOS DISEASE
(CAUSATION)**



**3. REASONS WHY MR. PUTT HAS
MESOTHELIOMA**

4. DAMAGES

REASONS WHY MR. PUTT HAS MESOTHELIOMA



Reasons Why Mr. Putt Has Mesothelioma

- NEGLIGENCE
- PRODUCT LIABILITY
- FAILURE TO WARN
- FAILURE TO RECALL OR RETROFIT

KNOWLEDGE

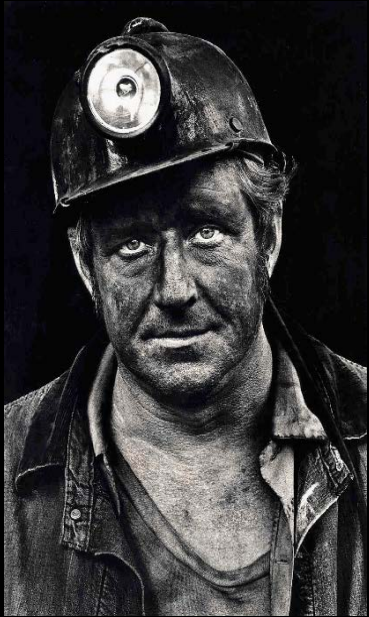


State of the Art

SCIENTIFIC & MEDICAL
KNOWLEDGE OF HAZARDS

KNOWLEDGE OF ASBESTOS HAZARDS

Asbestos
Miners



Asbestos
Millers



Asbestos
Users/
Bystanders



ASBESTOS BRAKE
MECHANICS



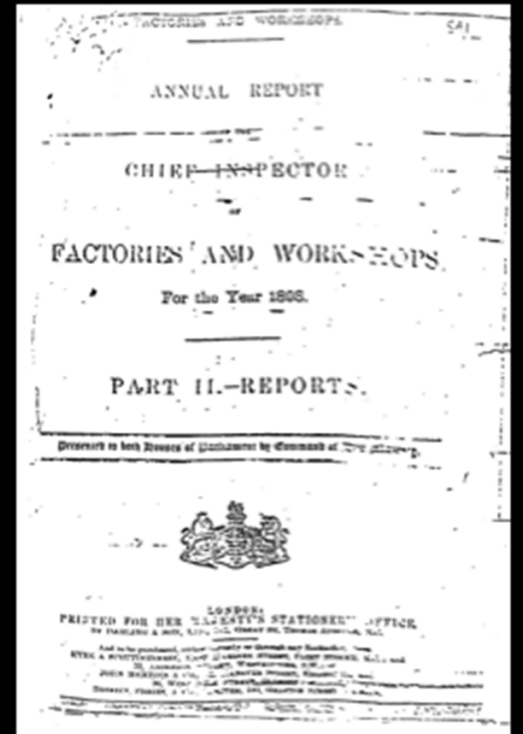
GUESS THE YEAR

“The EVIL effects of ASBESTOS DUST have also attracted my attention.... a microscopic examination of this MINERAL DUST revealed the sharp, glasslike, jagged nature of the particles, and where they are allowed to rise and to remain suspended in the air of a room, IN ANY QUANTITY, the effects have been found to be INJURIOUS, as might have been expected.”

AND THE ANSWER IS

1898

- **Lady Inspector of Factories** (U.K)



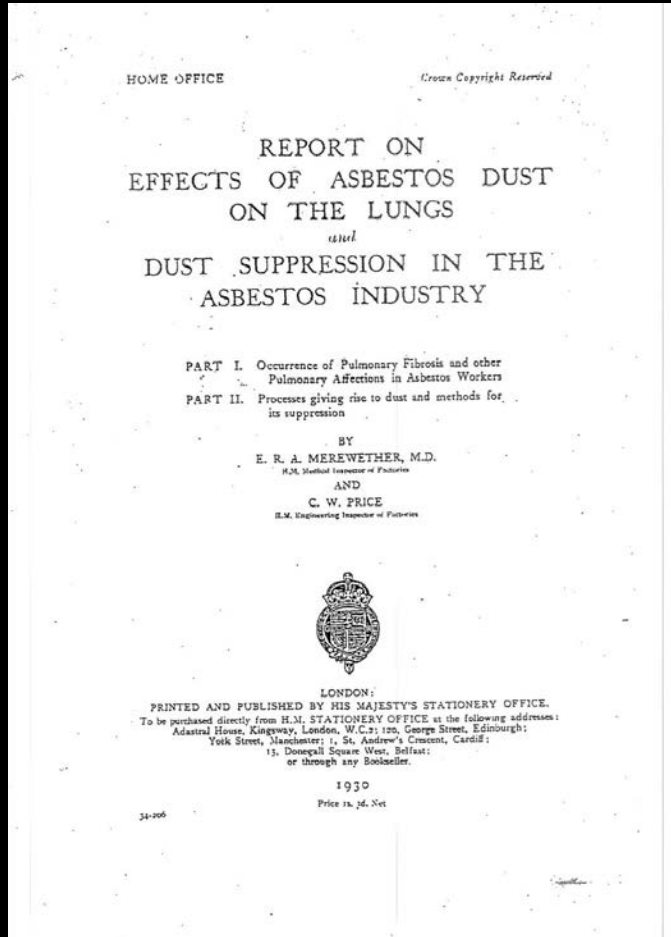
DECADES BEFORE OUR CLIENT WAS BORN, LET ALONE FIRST EXPOSED TO ASBESTOS

Known Hazards

1918

- **Hoffman (U.S. Bureau of Labor Statistics)-
BYSTANDERS AT RISK**
- “in the practice of American and Canadian life insurance companies ASBESTOS WORKERS are generally declined on account of the assumed HEALTH-INJURIOUS conditions of the industry.”

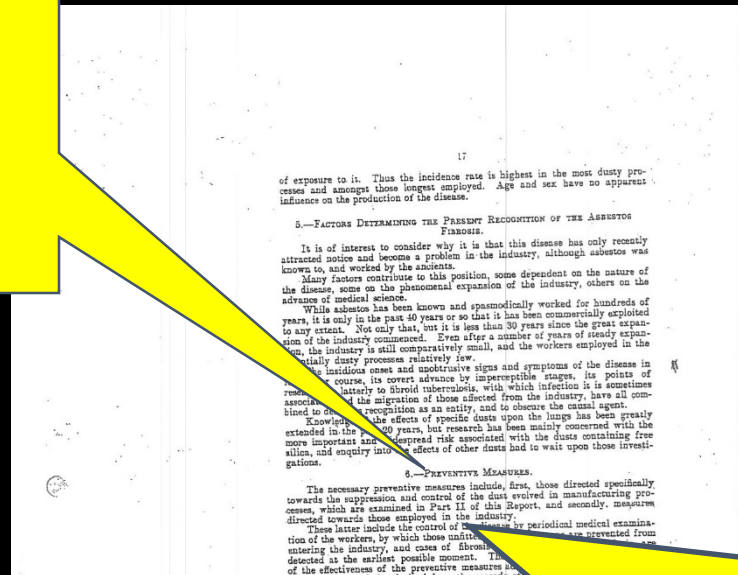
The 1930s: Even more studies show that asbestos can kill



SCF-ALLF-00155

1930 MEREWETHER & PRICE

PREVENTIVE MEASURES



Edward Rowland Alworth Merewether

The necessary preventive measures ...also include **the education of the individual**, as in other dangerous trades, to a **sane appreciation of the risk....**

Known Hazards

1936

States Require

Precautions

Around Toxic Dusts

Including Asbestos

- **Ventilation**
- **Exhaust**
- **Masks**

The 1940s: Studies confirm asbestos causes cancer



1942 COOK: VISIBLE DUST = DANGEROUS

Criteria for Evaluation of Dust Hazards

Page 124

INDUSTRIAL MEDICINE

the installation. It is easy to say, "Yes, that is a splendid exhaust system." But what if such an off-hand comment closes the subject and six years later one or two of the dozen girls on the operation develop asbestosis? If the condition does look good, what criteria can be used as guides?

Criteria for Evaluation of Dust Hazards

IN THE first place, too quick snap-judgments should be guarded against. If an unjustified OK is given, the health of the worker may be jeopardized; if a condemnation, then money may be spent unnecessarily, to say nothing of developing a lack of confidence of management in your judgment.

In the case of the asbestos dust condition, our evaluation of the exposure should be based on the knowl-

days and work weeks, this matter of duration increased importance. A year ago a man had been exposed to silica flour two hours a week in preparation of a paint for some one customer's evaluation of the hazard at that time may have been negligible. Today, that customer's requirements have increased so that all day long several hundred pounds of silica flour are used in the preparation of this same paint. From the point of view of the industrial hygiene man, the silica flour is part of the paint formula, but from the industrial hygiene point of view it falls within the category of siliceous dusts known as proliferative materials. And if the dust is present throughout the entire day and week, it should be given careful consideration in order to ascertain definitely whether or not

In the case of **asbestos dust condition**, our evaluation of the exposure should be based on the knowledge that the **toxic limit**

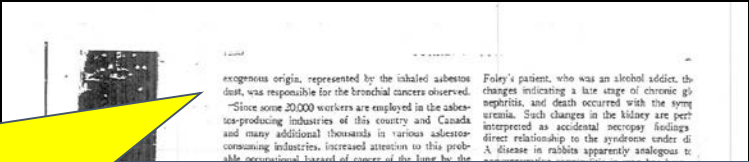
This is a **very small concentration**, so **small in fact that the condition may look**

If only a thin layer of dust has accumulated over six months or a year **and there are no visible puffs of dust escaping from the operation**, it is probable that the condition is satisfactory.

1948 Vincent Castrop- Brake Dust

- General Motors chief industrial hygienist, publishes “**RECOGNITION AND CONTROL OF FUME AND DUST EXPOSURE**” in National Safety News (widely available and read industrial safety magazine) in February 1948
- “Asbestos used in the formulation of brake lining is a potentially harmful compound. This material is the offending agent in the production of the lung ailment known as asbestosis.”
- Castrop recognizes dust exposures to asbestos regarding brake linings “in the subsequent operations of slitting, **GRINDING**, or surfacing.”

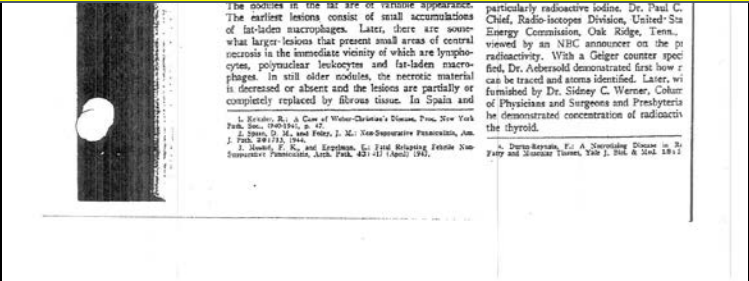
1949 JAMA: ASBESTOS CANCER



exogenous origin, represented by the inhaled asbestos dust, was responsible for the bronchial cancers observed. "Since some 20,000 workers are employed in the asbestos-producing industries of this country and Canada and many additional thousands in various asbestos-consuming industries, increased attention to this probable occupational hazard of cancer of the lung by the

Foley's patient, who was an alcohol addict, the changes indicating a late stage of chronic glomerulonephritis, and death occurred with the syndrome. Such changes in the kidney are pertinent interpreted as accidental necropsy findings direct relationship to the syndrome under discussion in rabbits apparently analogous to

Since some 20,000 workers are employed in the asbestos-producing industries....and many additional thousands in the asbestos-consuming industries, increased attention to this probable occupational hazard of cancer of the lung by the medical profession is desirable.



The nodules in the rat are of various appearance. The earliest lesions consist of small accumulations of fat-laden macrophages. Later, there are somewhat larger lesions that present small areas of central necrosis in the immediate vicinity of which are lymphocytes, polymorphonuclear leukocytes and fat-laden macrophages. In still older nodules, the necrotic material is decreased or absent and the lesions are partially or completely replaced by fibrous tissue. In Spalla and

particularly radioactive iodine. Dr. Paul C. Chief, Radio-isotopes Division, United States Energy Commission, Oak Ridge, Tenn., viewed by an NBC announcer on the program radioactivity. With a Geiger counter spectrometer, Dr. Abersold demonstrated first how it can be traced and areas identified. Later, was furnished by Dr. Sidney C. Werner, Collier of Physicians and Surgeons and Presbyterian he demonstrated concentration of radionuclides in the thyroid.

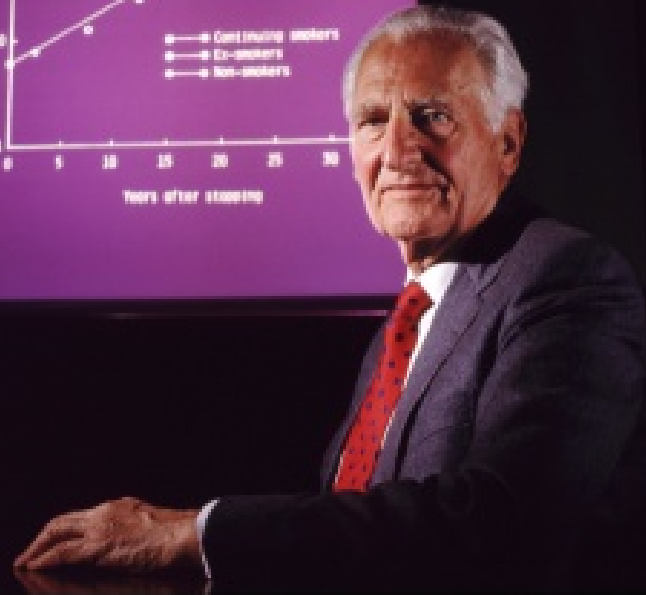
Known Hazards 1950's

1950

- Hueper (U.S.)

1955: ASBESTOS CANCER

SIR RICHARD DOLL



SCF-FA-4500

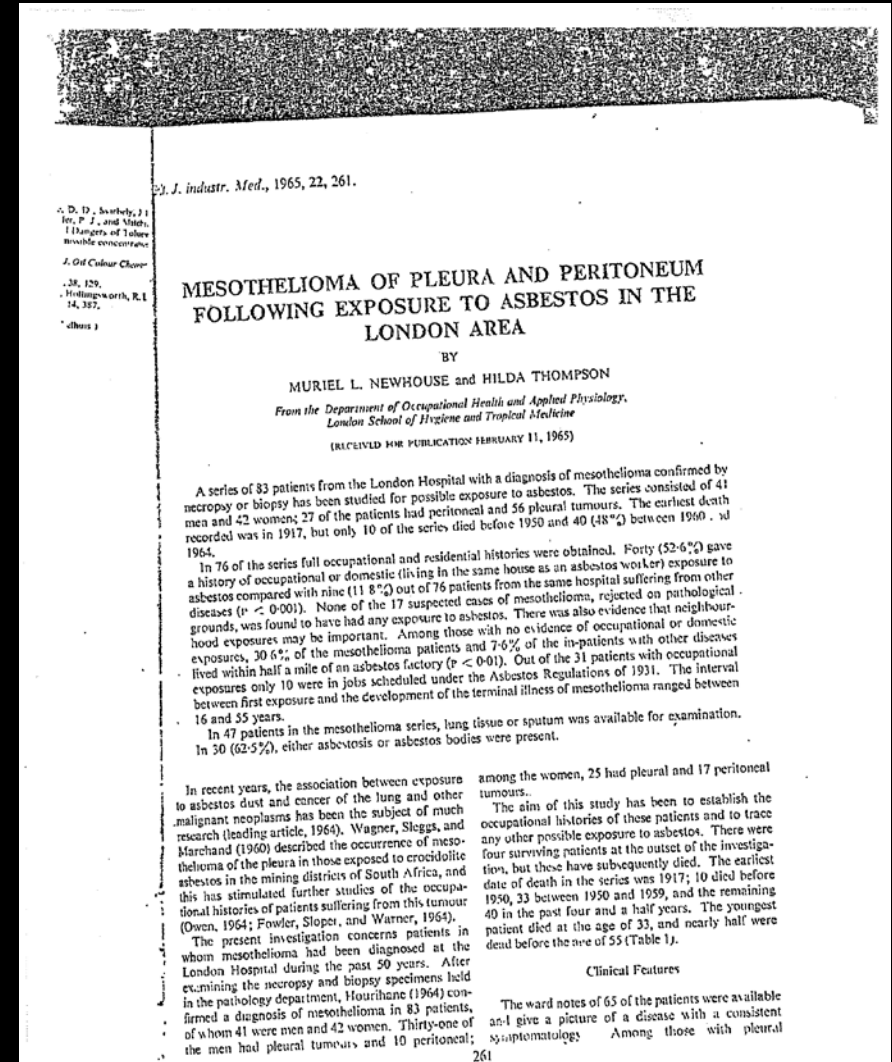
DR. SELIKOFF CONFERENCE



1965-Newhouse and Thompson presented at Selikoff Conference

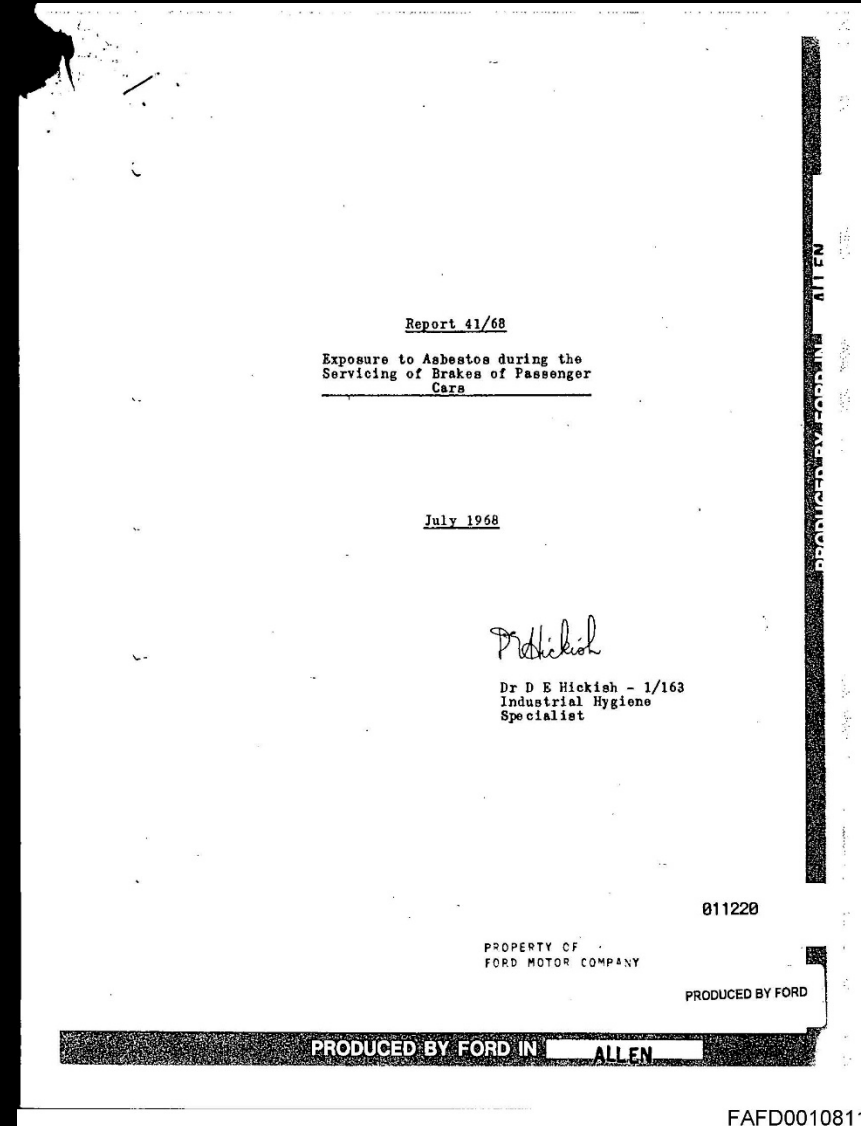
- Automotive Brake Mechanics AND THEIR SPOUSES AT HOME getting mesothelioma
- Females with peritoneal mesothelioma from **WASHING HUSBANDS' LAUNDRY**
- Neighborhood exposures

SCF-FA-5604



1968 - 1970 Hickish & Knight- Ford

- Average of 2.55 f/cc brake blowout
- We still have to warn and install safeguards and “strict precautions”
- We need to conduct medical surveillance



Hickish - 1968

Published version omits
recommendation for
warning in manuals.

Report 41/68

Exposure to Asbestos during the
Servicing of Brakes of Passenger
Cars

July 1968

D. E. Hickish

Dr D E Hickish - 1/163
Industrial Hygiene
Specialist

011220

PROPERTY OF
FORD MOTOR COMPANY

PRODUCED BY FORD

PRODUCED BY FORD IN ALLEN

FAFD0010811

1970: HICKISH & KNIGHT

**Expect Considerably Higher Exposures from
Manipulation of New Brake Linings**

Strict Precautions Needed

By the mid 1960s,
more than 700
articles show that
asbestos can kill.



EPA founded---- Dec 2, 1970



1971 OSHA



1972 OSHA REGULATIONS

11318

RULES AND REGULATIONS

[T.D. 72-163]

PART 10—ARTICLES CONDITIONALLY FREE, SUBJECT TO A REDUCED RATE, ETC.

Free Withdrawal of Supplies and Equipment for Aircraft

In accordance with section 309(d), Tariff Act of 1930, as amended (19 U.S.C. 1309(d)), the Department of Commerce has found and under date of April 25, 1972, has advised the Treasury Depart-

ments for an Occupational Exposure Standard for Asbestos by the National Institute for Occupational Safety and Health (NIOSH). Public notice was given of the receipt of the recommendations and their availability for inspection and copying. On or about February 26, 1972, the Advisory Committee on Asbestos Dust submitted its written recommendations to the Assistant Secretary of Labor for Occupational Safety and Health. Pursuant to the notice of rule making, a hearing was held on March 14 through

exposure to asbestos fibers and the appearance of adverse biological manifestations, such as asbestosis, lung cancers, and mesothelioma, have given rise to controversy as to the validity of the measuring techniques used and the reliability of the relations attempted to be established. Because of the long lapse of time between onset of exposure and biological manifestations, we have now evidence of the consequences of exposure, but we do not have, in general, accurate measures of the levels of exposure or

...it appears that levels of exposure which may be safe with regard to asbestosis are not safe with regard to mesothelioma....

Chapter XVII—Occupational Safety and Health Administration, Department of Labor

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Standard for Exposure to Asbestos Dust

On December 7, 1971, an emergency temporary standard concerning exposure to asbestos fibers was published in the FEDERAL REGISTER (36 F.R. 23207). In accordance with section 6(c) (3) of the Williams-Steiger Occupational Safety and Health Act of 1970, a notice of proposed rulemaking regarding a permanent standard for exposure to asbestos fibers was published in the FEDERAL REGISTER on January 12, 1972 (37 F.R. 466). The notice invited interested persons to submit both orally and in writing, data, views, and arguments concerning the proposal.

On or about January 23, 1972, the Advisory Committee on Asbestos Dust was established and requested to make written recommendations with regard to the proposed standard on asbestos. On or about February 1, 1972, the Department of Health, Education, and Welfare transmitted to the Secretary of Labor a written document containing Recommendations

but for not more than 8 hours in any one 8-hour day.

NIOSH in effect has recommended that the five-fiber TWA and 10-fiber peak concentrations be permitted only for 2 years; thereafter, TWA concentrations should be not more than 2 fibers per cubic centimeter (cm.³) of air, and peak concentrations should not exceed 10 fibers/cm.³, with no time restriction. Numerous objections and counterproposals have been made, with regard to both the limits of asbestos fiber concentrations and the time periods to comply with them. Some, for example, have recommended return to a 12-fiber standard of an earlier day, i.e., a level adopted under the Walsh-Healey Public Contracts Act in 1939. Others have recommended a two-fiber standard to become effective in 6 months, then a one-fiber standard for 2 years, and finally a zero-fiber standard after 3 years. These recommendations give a fair indication of the wide spread of the counterproposals.

No one has disputed that exposure to asbestos of high enough intensity and long enough duration is causally related to asbestosis and cancers. The dispute is as to the determination of a specific level below which exposure is safe. Various studies attempting to establish quantitative relations between specific levels of

exposure to asbestos fibers and the appearance of adverse biological manifestations, such as asbestosis, lung cancers, and mesothelioma, have given rise to controversy as to the validity of the measuring techniques used and the reliability of the relations attempted to be established. Because of the long lapse of time between onset of exposure and biological manifestations, we have now evidence of the consequences of exposure, but we do not have, in general, accurate measures of the levels of exposure or

Because the governing exposure standard for asbestos, and in particular for asbestos dust, is more hazardous than the standard for asbestos fibers, due to higher levels of exposure in the past; because it appears that levels of exposure which may be safe with regard to asbestosis are not safe with regard to mesothelioma; because the statute requires the protection of every employee, even of one who may have regular exposure to asbestos during a working life which may reach, or even exceed, 40 years; and because of several other considerations which have been urged and are reflected in the record of the proceeding, the conflict in the medical evidence is resolved in favor of the health of employees. As of July 1, 1978, TWA concentrations of asbestos fibers longer than 5 micrometers will not be allowed to exceed two fibers/cc., with a ceiling value of 10 fibers/cc. The current TWA concentrations of five fibers, and

1976 NIOSH p.955

TABLE III-2 (CONTINUED)

STUDIES OF HUMAN POPULATION CARCINOGENICITY

Author	Date	Finding	Group and Exposure
<u>Mixed Types of Fibers</u>			
DeLajarte et al (France)	1973	Evidence of association between mesotheliomas and past exposure to asbestos	Occupational exposures in some cases as brief as one day
Gobbato and Ferri (Italy)	1973	"	
Webster (South Africa)	1973	"	
Greenberg and Lloyd	1974	"	
Davies (UK)		"	
Hain et al (Fed. Rep. Germany)	1974	"	
Nurminen (Finland)	1975	"	
Stunn (Ger. Dem. Rep.)	1975	"	
Zielhuis (The Netherlands)	1975	"	
Newhouse et al	1973	Peritoneal tumors associated to heavy exposures	
Gilson	1973	5% to 7% asbestos workers' deaths due to mesotheliomas	"
Hammond and Selikoff	1973	"	"
Selikoff	1976		"
Newhouse and Berry	1975	11% asbestos workers deaths due to mesotheliomas	"
<u>Single Types of Fibers</u>			
<u>Crocidolite</u>			
Wagner	1960	Pleural and peritoneal cancer	Workers in mines, mills and in transportation and handling of crocidolite and population in vicinity of mines
Harrington et al	1971	Mesotheliomas	Mining population of crocidolite mines
Webster	1973		
McNulty	1962	"	Miners of crocidolite
Jones et al	1976	"	Women working with crocidolite in WWII gas mask canister factories

United States Department of Labor - OSHA

Safety and Health Topics - Asbestos


Safety and Health Topics | Asbestos 8/15/14 10:55 AM

UNITED STATES DEPARTMENT OF LABOR

Occupational Safety & Health Administration We Can Help What's New | Offices OSHA

SAFETY AND HEALTH TOPICS

Asbestos



What is asbestos?

Asbestos is the name given to a group of naturally occurring minerals that are resistant to heat and corrosion. Asbestos has been used in products, such as insulation for pipes (steam lines for example), floor tiles, building materials, and in vehicle brakes and clutches. Asbestos includes the mineral fibers chrysotile, amosite, crocidolite, tremolite, anthophyllite, actinolite and any of these materials that have been chemically treated or altered. Heavy exposures tend to occur in the construction industry and in ship repair, particularly during the removal of asbestos materials due to renovation, repairs, or demolition. Workers are also likely to be exposed during the manufacture of asbestos products (such as textiles, friction products, insulation, and other building materials) and during automotive brake and clutch repair work.

What are the hazards of asbestos?

Asbestos is well recognized as a health hazard and its use is now highly regulated by both OSHA and EPA. Asbestos fibers associated with these health risks are too small to be seen with the naked eye. Breathing asbestos fibers can cause a buildup of scar-like tissue in the lungs called asbestosis and result in loss of lung function that often progresses to disability and death. Asbestos also causes cancer of the lung and other diseases such as mesothelioma of the pleura which is a fatal malignant tumor of the membrane lining the cavity of the lung or stomach. Epidemiologic evidence has increasingly shown that all asbestos fiber types, including the most commonly used form of asbestos, chrysotile, causes mesothelioma in humans.^{1,2,3}

What can be done to reduce the hazards of asbestos?

Worker exposure to asbestos hazards are addressed in specific OSHA standards for the construction industry, general industry and shipyard employment sectors. These standards reduce the risk to workers by requiring that employers provide personal exposure monitoring to assess the risk and hazard awareness training for operations where there is any potential exposure to asbestos. Airborne levels of asbestos are never to exceed legal worker exposure limits. There is no "safe" level of asbestos exposure for any type of asbestos fiber.^{4,5} Asbestos exposures as short in duration as a few days have caused mesothelioma in humans.^{4,5,6,7} Every occupational exposure to asbestos can cause injury or disease; every occupational exposure to asbestos contributes to the risk of getting an asbestos related disease.⁸ Where there is exposure, employers are required to further protect workers by establishing regulated areas, controlling certain work practices and instituting engineering controls to reduce the airborne levels. The employer is required to ensure exposure is reduced by using administrative controls and provide for the wearing of personal protective equipment. Medical monitoring of workers is also required when legal limits and exposure times are exceeded.

How do I find out about employer responsibilities and worker rights?

Workers have a right to a safe workplace. The law requires employers to provide their employees with working conditions that are free of known dangers. The OSHA law also prohibits employers from retaliating against employees for exercising their rights under the law (including the right to raise a health and safety concern or report an injury). For more information see www.whistleblowers.gov or worker rights.

OSHA has a great deal of information to assist employers in complying with their responsibilities under the OSHA law.

<https://www.osha.gov/SLTC/asbestos/> Page 1 of 2

What can be done to reduce the hazards of asbestos?

There is no "safe" level of asbestos exposure for any type of asbestos fiber. Asbestos exposures as short in duration as a few days have caused mesothelioma in humans. Every occupational exposure to asbestos can cause injury of disease; every occupational exposure to asbestos contributes to the risk of getting an asbestos related disease.

• Who is _____



• What did _____



MAKE

• What did _____



SELL

• What did _____



SPECIFY AND RECOMMEND

• What did _____
KNOW IT



KNOW and WHEN did they

FORD MOTOR COMPANY





- Founded in 1903
- First sale of Asbestos Brakes in 1919
- Brakes were 40-60% Asbestos

Drum Brake Systems

Drum Brake



Drum Brake



Brake Shoes



Drum Brake Systems

Ford Sells Cars
With Brake
System



Ford Sells
Replacement
Brake Shoes



What's a Ford Brake Shoe?

- Ford does not manufacture brake shoes
- Ford buys brake shoes manufactured by others
- Ford puts the brake shoes into a Ford box
- Ford sells Ford brand brake shoes at Ford dealerships





FORD BRAKE ASSEMBLIES REQUIRED ASBESTOS BRAKES

ASBESTOS DUST CREATED BY STOPPING OF THE VEHICLE

THE DANGER FROM ASBESTOS DUST IN THE FORD BRAKE
DRUM IS THE SAME NO MATTER WHO MANUFACTURED
THE LINING

Mr. Putt's Exposure to



Brakes: Exposures To Asbestos

- Removing Drum
- Cleaning brake assembly
- Cleaning drum
- Opening box of brake shoes
- Sanding new brake shoes
- Sweeping up



FORD KNEW MECHANICS WOULD USE
COMPRESSED AIR TO 'BLOWOUT'
BRAKE ASSEMBLIES DURING BRAKE JOBS

FORD KNEW MECHANICS WOULD
SAND AND SCUFF BRAKE LININGS
DURING INSTALLATION

FORD - KNOWLEDGE

Trade Association Memberships:

- American Society for Testing & Materials from 1930's
- Society of Automotive Engineers
- American Industrial Hygiene Association from 1947
- Industrial Hygiene Foundation from 1946
- National Safety Council from 1947
- American Automobile Manufacturing Association formerly known as Motor Vehicle Manufacturers Association from 1968
- National Association of Manufacturers from 1986
- Michigan Manufacturers Association from 1915
- Alliance of Automobile Manufacturers from 1999

FORD & Asbestos:

Years: **Ford's Asbestos Knowledge:**

19	Ford Industrial Hygienist Says Warn (Hickish)
1970	Ford Recommends Using Vacuum Cleaner Instead of Compressed Air
1970	Ford Warns the Girl Scouts
1973	Overexposure to Asbestos Fibers Confirmed Using Compressed Air
1973	Local Exhaust Ventilation & Respirators Used by Ford Employees When Working With Asbestos
1973	Blowout Using Compressed Air <u>Banned</u> at Ford
1973	Ford Recommends Enclosure for Sanding Brakes
1974	Ford told by Chrysler limited exposure to asbestos may cause mesothelioma

FORD & Asbestos:

Years: Ford's Asbestos Knowledge:

1975	Ford Warns Ford Dealerships that Asbestos Brake Work is Dangerous
1976	Ford Warns Regional and District Managers that Asbestos Brake and Clutch Repair is Dangerous
1977	Ford Acknowledges Various Studies Which Say No Safe Level of Exposure to Asbestos
1980	Ford States Asbestos is a "Recognized Human Carcinogen"
1982	Ford Acknowledges No Safe Level of Exposure to Asbestos
1983	Ford States Asbestos is Dangerous - "Breathing Asbestos Dust May Cause Asbestosis and Cancer"
1985	Ford States Asbestos is Dangerous – "Breathing Asbestos Dust May Cause Asbestosis and Cancer"



Outside the courtroom, for over 40 years, **FORD** has told their own employees working with Asbestos-containing brakes is DANGEROUS.



Outside the courtroom, for over 40 years, **FORD** has told their own employees working with Asbestos-containing brakes is HAZARDOUS.



What FORD Did:

- **1930's – 1968:** Ford ignored the known medical evidence
- **1968 – 1973:** Ford ignored its own Industrial Hygienists
- **1973:** Ford ONLY warned Ford employees
- **1975:** Ford ONLY warned Ford Dealership employees

NO WARNINGS: 1919 UNTIL 1980's-ISH?





JUL 30 2008 15:25:17

MARK TAYLOR



JAN 3 2008
5:27:42

LAWRENCE M. ROSLINSKI, Ph.D.



MAR 29 2012 4:12:07 PM

ROGER L. WABEKE



00:01



Substitutes Possible?

Ford Outside Court

- 1971 – \$1.25 to substitute non-asbestos.
- 1977 – No money for substitutes.
- 1977 – Ford waiting for suppliers.
- 1977 – Suppliers waiting for Ford.
- 1977 – Ford does not want to spend time and money to redesign brakes.

Ford in Court

- Substitutes impossible.



Substitutes Possible?

- Substitutes WERE possible.
- BUT Substitutes then require testing and design.
- Would have taken a grand total of 2.3 employees.

Danger?

Ford's Private Documents

- 1968 – Doctors say warn
- 1973 – Banned at Ford
- 1975 – Warns Ford Dealers
- 1981 – Dangerous
- 1983 – Dangerous
- 1984 – Dangerous
- 1986 – Dangerous
- 1994 – Dangerous
- 2005 – Dangerous
- 2007 – Dangerous

Ford's Litigation Experts

- No Danger



Course Navigation

Safety & Environmental (3)

Mechanical Pollution Prevention

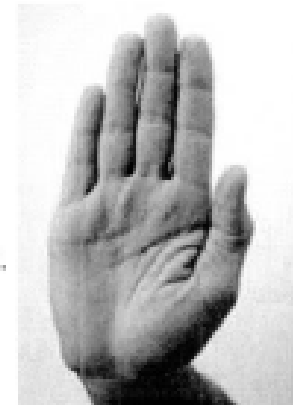
- Introduction
- Oil & Similar Fluids
- Antifreeze
- Floor Drains
- Absorbents & Spills
- Air Conditioning
- Batteries
- Asbestos
- Rags
- Tires
- Catalytic Converters
- Other Sources

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Asbestos Dust and Fibers are Dangerous

Although asbestos is a very useful material and inexpensive to produce, there is a dangerous downside. If asbestos, and particularly the fine dust from wear, is not handled correctly during repair, the tiny asbestos fibers can become airborne and can be inhaled. Inhalation of too much dust and fibers can cause a disease called "asbestosis". This disease can lead to other lung diseases, including mesothelioma and cancer. The following websites have additional information:

- www.ccar-greenlink.org
- www.osha.gov
- www.epa.gov





- Punitive Damages
- Clear & Convincing Evidence
- Malice or Oppression
- Conscious Disregard For Rights & Safety of Others



5. ASBESTOS CANCER EFFECTS

ECONOMIC DAMAGES

- Loss of Household Services
- Loss of Income
- Medical Expenses

NON-ECONOMIC DAMAGES

- **Physical Pain**
- **Mental Anguish**
- **Loss of Comfort**
- **Loss of Care**

- **Loss of Consortium**
(Jan Putt)

