

TOXICOLOGY RESEARCH LABORATORY

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FILE

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TOXICOLOGY OF INGESTED ASBESTOS
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INFORMATIVE SUMMARY WITH CONCLUSIONS BASED ON THE SAMPLE RECEIVED. ADDITIONAL INFORMATION INCLUDING THE EFFECTS OF REPEATED EXPOSURE MAY BE REQUIRED AS SPECIFIC USES AND FORMULATIONS ARE DEVELOPED OR IF PROCESS CHANGES OCCUR.

A survey of the literature that is pertinent to the ingestion of asbestos was made.

Asbestos is a ubiquitous mineral appearing everywhere - air, snow, rivers, drinking water, beverages, and drugs. Even control animals in one feeding study had asbestos particles in the several organs examined.

Since it must be assumed that during inhalation, some portion of the material must be swallowed, the incidence of gastrointestinal cancer in asbestos workers is pertinent to the ingestion of asbestos. Although the incidence of GI cancer in asbestos workers is relatively low in relation to the incidence of lung cancer, studies have consistently shown GI cancer incidences of 2-3 times that expected in the general population. The incidence appears to increase with the duration of exposure and there is a long latent period for development.

Feeding asbestos to animals has not increased the incidence of tumors.

A study designed to determine the carcinogenicity of various sizes of asbestos and fiberglass particles when applied to the pleura of rats showed a definite relationship between carcinogenicity and size. Fibers < 3 microns in diameter and > 20 microns in length are more carcinogenic than fibers with diameters > 3 microns regardless of length or less than 20 microns in length regardless of diameter. Most fibers found in water or beverages are individual fibers less than 20 microns in length.

In 1973 The Advisory Committee on Asbestos Cancer reported to the Director of the International Agency for Research on Cancer (a division of the World Health Organization). As part of their report they stated that, "such evidence as there is does not indicate any risk from asbestos fibers present in water, food, beverage, or drugs".

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CRI (6) See attached sheet.

DOW 01436

Condition	Industry and/or occupation	Symptoms	Agent	Log column
Noise effects on inner ear	Any industry and/or occupation involving exposure to excessive noise.	Tinnitus—hissing, ringing, buzzing, humming, thumping, whistling, or roaring in the ear—may be constant or intermittent and often accompanied by hearing loss. Clicking; cracking; or ticking sounds or abnormal or pathological sounds, originating within the patient's body (by a muscle contraction, etc.) in region of the ear and audible to others as well as to the patient.	Excessive noise	7f
Raynaud's phenomenon (secondary).....	Lumberjacks, chain sawyers, grinders, chippers, vinyl chloride polymerization industry.	Intermittent pallor and sometimes bluish-purple discoloration (cyanosis) of the skin precipitated by exposure to cold, without clinical evidence of blockage of the large peripheral vessels and with nutritional lesions (if present at all, limited to the skin). Blanching and numbing when exposed to chilling weather or emotional upsets with probable loss of muscular control and reduction of sensitivity to heat, cold, and pain are main symptoms. Cyanosis and pain are rare. Gangrene and serious complications are very rare if, indeed, they occur at all.	Whole body or segmental vibration; vinyl chloride monomer	7f
Extrinsic allergic alveolitis ...	Farmer's lung, bagassosis, bird fancier's lung, suberosis, malt worker's lung, mushroom worker's lung, maple bark disease, cheese washer's lung, coffee worker's lung, fish-meal worker's lung, furrier's lung, sequoiosis, wood worker's lung, miller's lung.	Difficult or labored breathing (dyspnea); fever; and oxygen deficiency (hypoxia) during acute phase lasting several weeks. Cough with scanty, black, stringy, occasionally bloody sputum; bluish-purple discoloration of mucous membranes (cyanosis); patchy infiltrates in the lung can also occur.	Various agents (usually a fungus or mold and dusty substances).....	7g
Extrinsic asthma or allergic asthma	Jewelry, alloy and catalyst makers; polyurethane, adhesive, paint workers; alloy, catalyst, refinery workers; solderers, plastic, dye, insecticide makers; foam workers; latex makers; biologists; printing industry; nickel platers; bakers; plastics industry; woodworkers; furniture makers; detergent formulators.	Sudden onset after exposure to an allergen. Sense of tightness in the chest due to spasmodic contraction of the bronchi; difficult or labored breathing (dyspnea); wheezing. Symptoms may subside in one hour or less, continue for several hours, or persist as status asthmaticus for many days. End of attack is marked by pronounced coughing with expectoration of thick, tenacious sputum, immediately followed by a sensation of relief and "clearing" of the air passages. Physical signs consist of prolongation of expiration and the presence of sonorous and sibilant rales throughout the chest; normal but labored respiration; markedly distended chest; bluish-purple discoloration of skin and mucous membranes (cyanosis). Between attacks breathing may be quiet, but forced expiration will produce sonorous or sibilant rales. Frequency and severity of attacks may be greatly influenced by secondary factors (e.g., changes in temperature and humidity); by exposure to noxious fumes; by fatigue; by endocrine changes (puberty, menstruation, pregnancy, menopause); by emotional stress. Since these secondary factors may perpetuate attacks, attention should be directed to their control.	Platinum; isocyanates; chromium and cobalt; aluminum soldering flux; phthalic anhydride; formaldehyde; gum arabic; N_2SO_4 ; flour; trimellitic anhydride; red cedar and other wood dusts; bacillus-derived exoenzymes ..	7e
Coalworkers pneumoconiosis	Coal miners.	Black spit increasing in quantity as disease advances; jet-black nodules and cavities of the lung; chest becomes barrel-shaped and there may be clubbing of the fingers; right heart failure or silico-ruberculosis may supervene to cause death; disease is visualized by X-ray as fine, discrete pinhead mottling or nodulation or dense conglomerate shadows resembling angel's wings; eventually large fibrotic masses develop and difficult or labored breathing with cough may ensue.	Coal dust	7b
Asbestosis	Asbestos industries and utilizers.	Progressive, difficult, or labored breathing (dyspnea); nonproductive cough (little or no sputum), unless pulmonary TB is present yielding bloodstained sputum; slight pain between shoulders, under shoulder blades, or sternum; visualized by X-ray as fine pulmonary fibrosis enmeshed with asbestos bodies giving a ground glass appearance; increased susceptibility to lung cancer; pleural plaques and calcifications are often present in the fibrous tissues and emphysema is extensive, but localized to lower and apical parts of the lungs.	Asbestos	7b

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