*Project SENSOR. News

Volume 35 No.1 Winter 2024

2024 Asbestos Updates Including Recommendation for Lung Cancer Screening

The hazards of exposure to asbestos are well recognized: non-malignant parenchymal and pleural scarring; and laryngeal, lung, mesothelioma and ovarian cancer. All forms of asbestos (chrysotile, crocidolite, amosite, tremolite, actinolite and anthophyllite) are classified by the International Agency for Research on Cancer (IARC) as Group I Known Human Carcinogens (IARC, 2012).

Although the use of asbestos is not banned in the United States, its use in the U.S. has markedly decreased with only one company still importing asbestos, Occidental Chemical Corporation. The other two companies that use asbestos in the U.S., Olin Corporation and Westlake Corporation, have indicated they will no longer import asbestos but will draw down stockpiles as they transition to asbestos-free substitutes. In all three companies, asbestos is used in the chlor-alkali process to make chlorine, caustic soda (sodium hydroxide) and hydrogen. Asbestos use is banned in more than 55 countries, including the countries of the European Union. However, asbestos mining/production has continued on a large scale with Russia producing 75% of all the asbestos in the world and the other 25% coming from China and Kazakhstan. The major users of asbestos are in India, countries in the Middle East and in Southeast Asia where asbestos products, particularly asbestos cement products for sewage and water pipes, continue to be made. Brazil and Canada, which formerly were major producers of asbestos have ceased mining although the state of Goias in Brazil recently passed a law allowing the mining of asbestos for export only from a major mine in that state. This state law is in conflict with a national ban on asbestos mining and litigation on this issue is evolving.

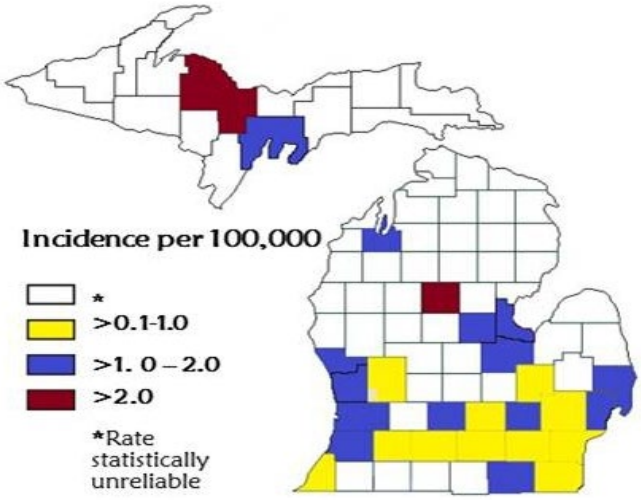
Despite the limited use of asbestos in the U.S. and the sources for imported asbestos not being from favored trading partners, legislation to ban asbestos in the U.S. has repeatedly stalled in congress. There is increased optimism on a ban being enacted in the U.S. with the decision in 2023 by the Olin Corporation, the largest user of imported asbestos into the U.S., to stop importing asbestos and its announcement that it supports the legislation to ban asbestos.

Historically asbestos has been used in building siding, roof shingles, cement products, floor tiles, insulation products, textiles, brake shoes, spackling, decorative stucco and gaskets. Although these uses have all ceased in the U.S., asbestos remains in place and asbestos fibers can be released into the air during demolition, renovation or repair. The historical use of asbestos, and the long latency period from first exposure to asbestos to the development of non-malignant respiratory disease and asbestos-caused cancers means that individuals are still being diagnosed with asbestos-related disease. From 1999-2019, in the Medicare fee-for-service inpatient and outpatient database there were 2,122,435 encounters for asbestosis. The number of encounters for asbestosis rose through 2011 after which they began to decrease (Kurth et. al., 2023). Additional encounters in Medicare-managed care plans are not included in the above count.

Another example of the ongoing occurrence of asbestos-related disease is the occurrence of mesothelioma. The number of mesothelioma cases peaked in Michigan at 136 cases in 2000. New cases per year range from 80-130, with 80 in 2020, The incidence of mesothelioma varies markedly by county (Figure 1). Exposure to asbestos in the construction industry occurs in all Michigan counties, so the increased rates of mesothelioma in certain counties reflect the use of asbestos in specific industries in these counties; the one major shipyard in the state that was located in Bay County, the use of asbestos in foundries and where foundries have been located and the presence of asbestos in the mining industry in the Upper Peninsula.

Regulations to identify the presence of asbestos and to minimize exposure to asbestos both to workers and to the general public are in place for demolition, renovation and repair projects. What can be done for individuals who have been exposed to asbestos in the past? Given the marked increased risk of lung cancer in individuals who have been exposed to asbestos,

Figure 1. Age-Adjusted Incidence Rate of Mesothelioma Among MI Residents, by County: 2001-2020



who also smoke cigarettes, the most important preventive action such individuals can take is to quit smoking and for health care providers to provide the support to facilitate smoking cessation.

What about screening and early diagnosis? Lung cancer screening with low-dose computed tomography is recommended by multiple professional groups including the US Preventive Services Task Force (USPSTF), the American College of Chest Physicians, the American Society of Clinical Oncology, the American Thoracic Society, the American Association for Thoracic Society, the American Cancer Society and the National Comprehensive Cancer Network. The most recent recommendation from the USPSTF released in 2021, which is shown in **Box 1**, expanded the age range and reduced the amount of cigarette smoking where lung cancer screening was recommended.

Box 1. "The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery."

Despite the known synergism between cigarette smoking and asbestos the official recommendations on lung cancer screening do not address occupational exposures such as asbestos that causes lung cancer. The Collegium Ramazzini, an independent international academy of 180 physicians and scientists from 35 countries each of whom is elected to membership, recently released a report on lung cancer screening (Ramazzini, 2023). The summary is in **Box 2**.

Box 2. "The Collegium recommends that persons at risk for lung cancer from occupational exposures be offered annual LDCT if their cumulative risk of lung cancer approximates the level of risk endorsed by the guidelines promulgated by the United States Preventive Services Task Force (USPSTF) in 2021 and the National Comprehensive Cancer Network (NCCN) in the United States in 2021. At present, these agencies recommend screening for people aged 50 and over who have smoked at least 20 pack-years of cigarettes. The Collegium recommends that additional lung cancer risk factors, including exposure to known or suspected occupational and environmental lung carcinogens; family history of lung cancer (especially among first degree relatives and relatives ≤ 60 years of age); a personal history of chronic obstructive lung disease, pneumoconiosis, or pulmonary fibrosis; or a personal history of cancer (excluding skin cancer) be considered as part of the risk assessment for eligibility determination for lung cancer screening. Latency, or the period of time since initial occupational exposure (e.g., ≥15 years) is another factor that should be considered. If the presence of these additional risk factors, in combination with age and smoking history, is associated with a level of risk that meets or exceeds the level of risk identified by the USPSTF and NCCN, then an annual low dose chest CT for lung cancer screening should be offered."

Unlike age and cigarette pack-years, which a health care provider can easily determine, health care practitioners will find it difficult to determine when to screen for lung cancer based on occupational exposure risk. Determining when a patient has had sufficient exposure to a carcinogen at work to justify lung cancer screening depends not only on obtaining a work history from the patient, but understanding what type of work is likely to be associated with exposure to an occupational carcinogen (**See Table 1**) and determining how many years of exposure are needed to increase the risk of developing lung cancer. The issue is complicated by the implementation of workplace controls in more recent years, which means for example a construction worker in the last 20 years will have less or even minimal exposure to asbestos compared to a construction worker in the 1970's or before. There is no equivalent metric of exposure to cigarette pack-years that allows health care practitioners to conclude if the patient worked for so many years in certain decades then lung cancer screening is indicated.

Table 1. IARC Agents and Processes Classified as a Known Human Lung Carcinogen	
Agent	**Occupation, Industry or Process**
Arsenic and inorganic arsenic compounds	Acheson process
Asbestos (all forms)	Aluminum production
Beryllium and beryllium compounds	Coal gasification
Bis (chloromethyl) ether; chloromethyl methyl ether (technical grade)	Coke production
Cadmium and cadmium compounds	Haematite mining (underground)
Chromium (VI) compounds	Iron and steel founding
Coal, indoor emissions from household combustion	Painter
Coal tar pitch	Rubber manufacturing industry
Diesel engine exhaust	
Nickel compounds	
Outdoor air pollution	
Particulate matter in outdoor air pollution	
Plutonium	
Radon-222 and its decay products	
Silica dust, crystalline, in the form of quartz or cristobalite	
Soot	
Tobacco smoke, secondhand	
Welding fumes	
X- and Gamma-radiation	

However, for asbestos, non-malignant radiographic changes of asbestos exposure can provide some information; pleural changes from asbestos confirm that the patient has had asbestos exposure (Pairon, et al., 2014) and parenchymal scarring (asbestosis) indicates that lung cancer screening is indicated whether or not the patient had ever smoked cigarettes (Markowitz, et.al., 2013). This study also provided data that anyone with 20 or more years of asbestos exposure, who had ever smoked cigarettes, would be at a level of risk of lung cancer equivalent to a 30-pack-year cigarette smoker.

Based on age and cigarette smoking, low dose CT screening for lung cancer has been recommended in the U.S. since 2013 yet in 2018 only 5% of the individuals who met these age/cigarette criteria had such screening (Fedewa, et. al., 2021). Rates in Michigan are similar to the 5% U.S. average. In comparison, the New England states and Kentucky have higher lung cancer screening rates of 10-15%.

Both current and former workers and their health care providers will need better ways to assess whether an individual has had sufficient workplace exposure to an occupational carcinogen, if the latest recommendation from the Collegium Ramazzini to include consideration of occupational exposures will increase rates of low dose CT screening for lung cancer among patients at high risk for developing lung cancer.

References

Collegium Ramazzini. Statement On Occupational Lung Cancer Screening. 2023
https://www.collegiumramazzini.org/download/statements/CR-Statement-Occup-Lung-Cancer-Screening-FINAL-11-2-23-WRITING-GROUP-ADDED.pdf

Fedewa SA, Kazerooni EA, Studts JL, et al. State variation in low-dose computed tomography scanning for lung cancer screening in the United States. J Natl Cancer Inst. 2021;113:1044-1052.

IARC Monographs On The Evaluation Of Carcinogenic Risks to Humans. Asbestos (Chrysotile, Amosite, Crocidolite, Tremolite, Actinolite, and Anthophyllite) 2012;100C:219-309.

Kurth L, Casey ML, Mazurek JM, Blackley DJ. Pneumoconiosis incidence and prevalence among US Medicare beneficiaries, 1999-2019. Am J Ind Med 2023;66:831-841.

Markowitz SB, Levin SM, Miller A, Morabia A. Asbestos, asbestosis, smoking, and lung cancer. New findings from the North American Insulator Cohort. Am J Respir Crit Care Med 2013; 188:90-96.

Pairon JC, Andujar P, Rinaldo M, Ameille J, Brochard P, Chamming's S, Clin B, Ferretti G, Gislard A, Laurent F, Luc A, Wild P, Paris C. Asbestos exposure, pleural plaques, and the risk of death from lung cancer. Am J Respir Crit Care Med 2014; 190:1413-1420.

USPSTF. Final Recommendation Statement. Lung Cancer: Screening 3/9/21.
https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/lung-cancer-screening

*Project S E.N.S.O.R. News

Michigan State University
College of Human Medicine
West Fee Hall
909 Wilson Road, Room 117
East Lansing, MI 48824-1316
Phone (517) 353-1846

In this issue: V35n1: 2024 Asbestos Updates Including Recommendation for Lung Cancer Screening

*PS Remember to report all cases of occupational disease!

Printed on recycled paper.

The project SENSOR News is published quarterly by Michigan State University-College of Human Medicine with funding from the National Institute for Occupational Safety and Health and is available at no cost. Suggestions and comments are welcome.
(517) 353-1846
MSU-CHM
West Fee Hall
909 Wilson Road, Room 117
East Lansing, MI 48824-1316

Michigan Law Requires the Reporting of Known or Suspected Occupational Diseases

Reporting can be done by:

WEB
oem.msu.edu
E-Mail
ODREPORT@msu.edu
FAX
(517) 432-3606
Telephone
1-800-446-7805
Mail
Michigan Occupational Safety & Health Administration (MIOSHA)
Management and Technical
Services Division
PO Box 30649
Lansing, MI 48909-8149

Reporting forms can be obtained by calling 1-800-446-7805