HELSINKI CRITERIA UPDATED

In 1997, a "Consensus Report" was published by a group of researchers to provide diagnostic criteria for various asbestos-related diseases. Because the group met in Helsinki, Finland, the report is referred to as the "Helsinki Criteria." The group has now published an update which is available online. Asbestos, asbestosis, and cancer, the Helsinki criteria for diagnosis and attribution 2014: recommendations, *Scand J Work Environ Health* – online first. doi: 10.5271/sjweh.3462. www.sjweh.fi/download.php?abstract_id=3462&file_nro=1

The 2014 update reiterates the positions taken in the 1997 article regarding the diagnosis of various asbestos-related diseases and the ability to attribute each disease to asbestos exposure. The update also provides additional diagnostic criteria to consider in diagnosing each of the asbestos-related diseases. The update also adds laryngeal cancer and ovarian cancer to the list of cancers that can be causally related to asbestos. They specifically conclude that there is insufficient evidence to attribute colo-rectal cancer and stomach cancer to asbestos exposure.

Asbestosis: The new criteria now includes a minimum criteria for the diagnosis of asbestosis by CT scans.

> We therefore recommend that the sum grade of ≥2-3 bilateral irregular opacities in lower zones according to the reference film or bilateral honeycombing (sum grade ≥2) would be sufficient to represent fibrosis according to the ICOERD system. In histopathology, bronchiolar wall fibrosis has been associated with asbestos exposure and other exposures including smoking (16). Subpleural curvilinear lines or dots in HRCT are findings of bronchiolar fibrosis.

Lung Cancer: There are no new criteria for causation of lung cancer; however, they have expanded the types of lung cancer that can be attributed to asbestos.

> The 1997 Helsinki criteria mentions four major types of lung cancer that are associated with asbestos exposure (squamous, adeno, large-cell and small cell carcinoma). The current classification (19) mentions two additional types: sarcomatoid and adenosquamous carcinoma. Any of these six major histological categories may be considered to occur as a consequence of asbestos exposure (20).

Mesothelioma: There are no new criteria for causation of the mesothelioma. For diagnosis, the report provides as follow:

> We recommended that in mesotheliomas with an epithelioid component, at least two positive (mesothelial) and two negative (carcinomatous) markers be used for making a histopathological diagnosis of malignant mesothelioma. Because the usage of these markers has not yet been standardized, it is recommended that each laboratory performing immunohistochemical studies determine which positive and negative markers best fit its needs. It is further recommended that markers used should have ≥80% sensitivity and specificity.
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> In the case of pleural tumors the main differential diagnosis concerns pulmonary carcinomas. For peritoneal mesotheliomas, pulmonary carcinomas are much less likely to be in the differential diagnosis. The selection of negative markers should reflect this. It is also recommended that for peritoneal malignancies in women, stains for estrogen (ER) and progesterone (PR) receptors be added to the panel.
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> The diagnostic markers used in epithelioid mesotheliomas are far less useful in sarcomatoid mesotheliomas. Cytokeratin expression is a useful marker in the differentiation of desmoplastic mesothelioma from fibrotic process (through demonstration of invasion) as well as differentiation of sarcomatoid mesothelioma from sarcomas. This marker is not useful in separating sarcomatoid mesotheliomas from sarcomatoid lung cancers
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> It should be noted that clinical correlation with the gross distribution of the tumor is critical for diagnosis of malignant mesothelioma, and none of the immunohistochemical markers are entirely specific for that diagnosis. There are no generally accepted immunohistochemical markers for distinction between benign and malignant mesothelial proliferations.

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Table 1 on page 9 of the article provides a comparison between the 1997 and the 2014 versions of the criteria.

Table 1. Comparison of the 1997 Helsinki criteria and the 2014 update. [BAL=broncho alveolar lavage; CAP-NIOSH= College of American Pathologists-National Institute of Occupational Safety and Health ; CT=computer tomography; HRCT=high-resolution computer tomography; ICOERD=international classification of occupational and environmental disease; ILO=International Labor Organization; LDCT=low-density computer tomography; WHO=World Health Organization.]

Item	Helsinki criteria 1997	Update 2014
General considerations	Guidelines for identifying asbestos-exposed persons with structured interview and fibers from tissue and BAL specimen given. Guidelines for the diagnostics of asbestosis, pleural disorders, mesothelioma and lung cancer given.	Update concentrates on: • screening for asbestos-related lung cancer; • follow-up of asbestos-exposed workers and diagnosis of non-malignant asbestos diseases; • new asbestos-related disease entities; and • pathology and biomarkers.
Asbestos-related non-malignant diseases	Roggli-Pratt modification of the CAP-NIOSH classification of asbestosis recommended. Radiology: small opacities with ILO grade 1/0 in radiographs regarded as early stage asbestosis, HRCT in selected cases. Development of standardized reporting of HRCT scans recommended.	New histology classification of asbestosis (16) is adapted. Criteria for the use of CT imaging in the diagnostics of asbestos related diseases presented. Recommendation to use the international ICOERD CT classification in international studies. Retroperitoneal fibrosis described as a new entity due to asbestos exposure (under certain conditions).
Asbestos-related malignant diseases		
Lung cancer	Four types of lung cancer associated with asbestos exposure defined. Cumulative exposure of 25 fiber-years increases the lung cancer risk 2-fold. Risk estimates also related to tissue fiber levels and asbestos bodies in BAL fluid.	The current classification (WHO 1999) includes two additional types of lung cancer (sarcomatoid and adenosquamous). These are included as types of lung malignancies that may occur as a consequence of asbestos exposure.
Mesothelioma	Histopathological diagnosis discussed.	Additional recommendations for histopathological diagnosis given for epithelioid and sarcomatoid mesotheliomas, separate recommendations for peritoneal mesotheliomas.
Other malignancies	Discussed as research needs	Laryngeal and ovarian cancers are included as cancers that may occur as a consequence of asbestos exposure. Guidelines for attribution given.
Surveillance and screening	Possibilities for primary and secondary prevention (screening) discussed. Scientific studies on screening recommended. Technical requirements for HRCT described (Helsinki conference in 2000). Several research topics suggested.	Medicolegal surveillance (including spirometry) recommended according to the national regulation stratified according to the intensity, latency, and duration of exposure. Vaccination against influenza and pneumococcus recommended for asbestosis patients. LDCT screening recommended for asbestos-exposed workers under certain circumstances (see text for details). The importance of obtaining standardized data in an international setting is stressed.