Coal Worker's Pneumoconiosis

Other Names: Black lung disease; Pneumoconiosis; Anthrosilicosis; CWP. Caplan Syndrome is a related condition.

Responsibilities:
Hospital: Report by phone, fax, or mail
Lab: Report by phone, fax, or mail
Physician/Health care providers: Report by phone, fax, or mail
Medical Examiners: Report by phone, fax, or mail
Poison Control Centers: Report by phone, fax, or mail
Occupational Nurses: Report by phone, fax, or mail
Local Public Health Agency (LPHA): No follow-up required, unless outbreak occurrence

Report to the IDPH Bureau of Environmental Health Services:
Iowa Department of Public Health
Bureau of Environmental Health Services
Lucas State Office Building
321 E. 12th Street
Des Moines, Iowa 50319-0075
Phone (Mon-Fri 8 am - 4:30 pm): 800-972-2026
Fax: 515-281-4529
24-hour Disease Reporting Hotline: (For use outside of EHS office hours) 800-362-2736
Web: https://idph.iowa.gov/ehs/reportable-diseases
Report Form: Environmental & Occupational Report Form on web

1. The Disease Definition

Coal worker's pneumoconiosis (CWP) is a lung disease caused by chronic inhalation of dust from high-carbon coal (anthracite and bituminous) and rarely graphite, typically over ≥ 20 yr. Inhalation of silica contained in coal may also contribute to clinical disease.

A. Clinical Description

CWP occurs in two forms: simple and complicated (progressive massive fibrosis or PMF). The simple form is usually not disabling, but the complicated form often is, and also causes premature death.

Early CWP does not usually cause symptoms. Most chronic pulmonary symptoms in coal miners are caused by other conditions, such as industrial bronchitis from coal dust or coincident emphysema from smoking. Cough can be chronic and problematic in patients even after they leave the workplace, even in those who do not smoke. PMF causes progressive dyspnea. Occasionally, patients cough up black sputum (melanoptysis), which occurs as a result of rupture of PMF lesions into the airways. PMF often progresses to pulmonary hypertension with right ventricular and respiratory failure and premature death.

B. Sources of Exposure

Coal workers pneumoconiosis is caused by the inhalation of dust from coal, graphite, or man-made carbon.

C. Population at Risk

Chronic lung diseases, such as pneumoconiosis (black lung) were once common in miners, leading to reduced life expectancy. In some mining countries, CWP is still common, with approximately 4,000 new cases every year in the USA (4% of workers annually) and 10,000 new cases every year in China (0.2% of workers).

The incidence and rate of CWP progression is related to the amount of respirable coal dust to which miners were exposed during their working lifetime. Most affected workers are over the age of 50, and have over 20 years of exposure history, although some workers have been diagnosed after as few as 10 years of exposure

To characterize the impact of premature mortality attributed to CWP in the United States, CDC's National Institute for Occupational Safety and Health (NIOSH) analyzes annual underlying cause of death data. Data tables are available at https://wwwn.cdc.gov/eworld/Grouping/Coal_Workers_Pneumoconiosis/93.

D. Diagnosis, Treatment, and Prognosis

Diagnosis depends on a history of exposure and chest x-ray or chest CT appearance. In patients with CWP, x-ray or CT reveals diffuse, small, rounded opacities or nodules. The finding of at least one opacity > 10 mm suggests PMF. The specificity of the chest x-ray for PMF is low, because up to 1/3 of the lesions identified as being PMF turn out to be cancers, scars, or other disorders. Chest CT is more sensitive than chest x-ray for detecting coalescing nodules, early PMF, and cavitation.

Treatment is rarely necessary in simple CWP, although smoking cessation and tuberculosis (TB) surveillance are recommended. Patients with pulmonary hypertension, hypoxemia, or both are given supplemental oxygen therapy. Pulmonary rehabilitation can help more severely affected workers carry out activities of daily living. Workers with CWP, especially those with PMF, should be restricted from further exposure, especially to high concentrations of dust. TB is treated in accordance with current recommendations.

The outcome for the simple form of coal workers pneumoconiosis is usually good. However, the complicated form may become a disabling illness that may include cor pulmonale, or failure of the right side of the heart, pulmonary tuberculosis, and premature death.

E. Prevention of Exposure

CWP can be prevented by suppressing coal dust at the coal face. Despite long-standing regulations, exposures continue to occur in the mining trade. Respiratory masks provide only limited protection. Preventive measures include eliminating exposure, stopping smoking, and giving pneumococcal and influenza vaccinations.

Medical surveillance is critical to detect coal workers' pneumoconiosis as early as possible, to guide intervention, and to keep the disease from advancing to stages in which it becomes progressively debilitating and life-threatening. Because patients with CWP often have had exposure to both silica dust as well as coal dust, surveillance for TB is usually done utilizing annual tuberculin skin testing. In those with positive test results, sputum culture and cytology, CT, and bronchoscopy may be needed to confirm TB.

In light of an observed onset of advanced pneumoconiosis among younger coal miners, and the apparent regional clustering of rapidly progressive cases, the National Institute for Occupational Safety and Health (NIOSH), in collaboration with the Department of Labor Mine Safety Health Administration (MSHA), has developed, staffed, and implemented the Enhanced Coal Workers' Health Surveillance Program (ECWHSP). Additional information is available at www.cdc.gov/niosh/topics/cwhsp/ecwhsp.html.

Outreach and awareness resources are available through the references listed below.

2. Reporting Criteria

A. Disease Reporting

All cases of coal workers pneumoconiosis are reportable in Iowa as a sub-section of the non-communicable respiratory disease surveillance program, under the definition found in the Iowa Administrative Code [641] Chapter 1: *"Noncommunicable respiratory illnesses"* means an illness indicating prolonged exposure or overexposure to asbestos, silica, silicates, aluminum, graphite, bauxite, beryllium, cotton dust or other textile material, or coal dust. "Noncommunicable respiratory illnesses" includes, but is not limited to asbestosis, coal worker's pneumoconiosis, and silicosis."

Mandatory reporting is required of health care providers, clinics, hospitals, clinical laboratories, and other health care facilities; school nurses or school officials; poison control and information centers; medical examiners; occupational nurses. Hospitals, health care providers, and clinical laboratories outside the state of Iowa for confirmed or suspect cases in an Iowa resident. Primary responsibility for reporting falls to the physician or other health practitioner attending the patient and to laboratories performing tests identifying the disease, including tissue biopsy testing that is diagnostic of the disease.

Additional information and reporting forms can be found in the Iowa Administrative Code [641] Chapter 1, which can be accessed through a link on the IDPH Bureau of Environmental Health Services web page at https://idph.iowa.gov/ehs/reportable-diseases . Call the IDPH EHS hotline at 800-972-2026 during regular business hours if you have questions.

B. References

National Institute of Occupational Health and Safety (NIOSH)
https://www.cdc.gov/niosh/topics/cwhsp/default.html

Coal Workers' Health Surveillance Program (CWHSP) Data Query System
https://webappa.cdc.gov/ords/cwhsp-database.html

CDC/NIOSH Data: https://wwwn.cdc.gov/eworld/Grouping/Coal_Workers_Pneumoconiosis/93

Mine Safety and Health Administration: http://www.msha.gov/endblacklung

Merck Manuals Online Medical Library: http://www.merckmanuals.com/professional/pulmonary-disorders/environmental-pulmonary-diseases/coal-workers%E2%80%99-pneumoconiosis

All links were active as of February 2018