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Leading Work-Related Diseases and Injuries -- United States

The National Institute for Occupational Safety and Health (NIOSH) has recently developed a suggested list of the 10 leading work-related diseases and injuries (Table 1). Three criteria were used to develop the list: the disease's or injury's frequency of occurrence, its severity in the individual case, and its amenability to prevention. The list is suggested with three purposes: 1) to encourage deliberation and debate among professionals about the major problems in this field of public health, 2) to assist in setting national priorities for efforts to prevent health problems related to work, and 3) to convey to a diverse audience the concerns of the leadership of NIOSH and the focus of the Institute's activities. The list is intended to be dynamic; it will be reviewed periodically for necessary updating as knowledge increases and as conditions change and are brought under better control.

The following article contains a detailed discussion of occupational lung disease, the problem top-ranked on the list; future articles will elaborate on the others. OCCUPATIONAL LUNG DISEASES

The lung is both a target organ and a portal of entry for toxic substances. The likelihood of toxic exposure is high; for example, an estimated 1.2 million workers each year are potentially exposed to silica dust alone (2). The recognition of occupational lung diseases may be difficult, since the latent period for such diseases may be long--as long as 15 years for silicosis and 30 years or more for asbestos-related diseases. Other factors, such as cigarette smoking, may also contribute significantly to the disease process and hence obscure the association between work and the disease (3).

Six important components of occupational lung diseases are described below. Each is preventable, although years of effective control measures will be required to eliminate diseases of long latency. Because of the rapid rate at which new potentially toxic agents are introduced into the workplace, vigorous pre-market toxicologic testing of agents and effective disease surveillance are essential if epidemics of occupational lung diseases are to be avoided. The U.S. Public Health Service has established the following national objective for the prevention of occupational lung diseases: "by 1990, among workers newly exposed after 1985, there should be

virtually no new cases of four preventable occupational diseases--asbestosis, byssinosis, silicosis, and coal workers' pneumoconiosis" (4). These diseases, as well as lung cancer and occupational asthma, are briefly discussed below.

Asbestosis: Asbestosis is characterized by diffuse, extensive scarring of the lung and progressive shortness of breath. Once established, the disease progresses even after exposure ends; there is no specific treatment. The latent period is 10-20 years. Smoking appears to increase the risk of death from asbestosis by a factor of two to three. Longitudinal studies of groups of asbestos insulation workers and shipyard workers have revealed that 10%-18% may be expected to die of asbestosis (5).

Byssinosis: This condition, characterized by both acute (reversible) and chronic lung disease, is associated with inhalation of the dusts of cotton, flax, or hemp. Symptoms include "chest tightness," cough, and obstruction of the small airways. Severely impaired lung function has disabled an estimated 35,000 current and retired textile workers (6). The specific causal agent(s) in the various dusts are yet to be identified (7).

Silicosis: Although the ill effects of exposure to free crystalline silica have been known for centuries, the prevalence of disabling silicosis remains high in certain groups of workers (8). Nearly 60,000 currently exposed workers in mines and foundries, in abrasive blasting operations, and in stone, clay, and glass manufacturing may be expected to suffer some degree of silicosis (9).

Coal workers' pneumoconiosis (CWP): The estimated prevalence of CWP among currently employed coal miners is about 4.5%. Approximately 0.2% of coal workers have been diagnosed as having progressive massive fibrosis, a potentially disabling form of CWP (10). In 1974, there were an estimated 19,400 cases of CWP. Some 4,000 deaths each year are attributed to legislatively defined "black lung disease" (9). Industrial bronchitis, another medical condition associated with exposure to coal dust, may lead to decreased ventilation capacity, but it is not well correlated with chest roentgenographic changes (11).

Lung cancer: The single most important cause of lung cancer is tobacco smoke (12). However, numerous occupational agents are associated with lung cancer, including arsenic, asbestos, chloroethers, chromates, ionizing radiation, nickel, and polynuclear aromatic hydrocarbon compounds (13). Tobacco smoke may interact synergistically with some of these agents (e.g., asbestos) to sharply increase the risk (5). Of special concern in this regard are workers currently or previously exposed to asbestos (estimated from 7.6 to 13.2 million) (14, 15); as many as 6,000 asbestos-related lung cancers may occur annually (15).

Occupational asthma: Hypersensitivity reactions to a wide variety of occupational organic and inorganic agents can cause asthma and hypersensitivity pneumonitis. The prevalence of occupational asthma varies from 10% to nearly 100% of workers in certain occupations (16). Many agents are incriminated as etiologic for occupational asthma, including grain dusts, flour, metals, inorganic chemicals, isocyanates, enzymes, and fungi. The list of agents associated with hypersensitivity pneumonitis is also long. If exposure continues, these conditions may result in progressive, irreversible pulmonary fibrosis. Reported by Div of Surveillance, Hazard Evaluation, and Field Studies, Office of Director, NIOSH, CDC.

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