

# Coal Workers' Pneumoconiosis in an Affluent Society

LORIN E. KERR, M.D., M.P.H.

**T**HE OMINOUS acceleration of charges for medical care services is the number one health problem facing the people of the United States today, and particularly organized labor. Collective bargaining agreements have usually included monetary increases for health benefits, but no more than one-third of the costs have been covered, and many essential health services have been omitted.

## Labor's Stake in Comprehensive Care

To meet the escalating costs, organized labor has had to run hard to stand still, but as consumers its members have become medically sophisticated. The United Mine Workers of America Welfare and Retirement Fund is an example of a unique national program providing one segment of the nation's work force with almost comprehensive medical care of high quality (1, 2). This sophistication was further underscored when the United Mine Workers of America (UMWA) recently established its own department of occupational health. While this department is initially devoting major attention to job-related illnesses, it is already assisting the union membership in resolving other health problems in addition to serving as a focal

point for other unions interested in moving in the same direction. It is the first time in the history of U.S. labor unions that such concern has been implemented.

Organized labor is now demanding comprehensive, readily accessible medical care at a cost the economy can afford. The need and discontent are so great that former staunch advocates of the voluntary approach are seeking the solution through organized national health insurance (3, 4).

In its struggle to provide high-quality medical care at a reasonable cost, organized labor has become a strong proponent of prepaid group practice (5, 6). The reduction of hospital use through the provision of continuing, coordinated, comprehensive, ambulatory medical care results in marked financial savings (7, 8). Prepaid group practice thus enjoys an undisputed economic advantage over all other methods of delivering medical services. Until recently, organized labor and consumer organizations like the Group Health Association of America were the solitary forces promoting and subscribing to prepaid group practice. Today they are being joined by medical school faculties, management consultants, entrepreneurs, corporations, and conglomerates.

## Health Manpower, a Key Problem

Attempts to resolve the problems of the quality, quantity, and cost of medical care are inextricably intertwined with the shortage and maldistribution of health manpower. The

---

*Dr. Kerr is director of the department of occupational health, United Mine Workers of America, Washington, D.C. This paper is based on one he presented at the Long Range Planning Conference, American College of Radiology, Washington, D.C., September 27, 1969.*

health industry, employing more than 3½ million persons, is now the third largest industry in the nation, with annual expenditures exceeding \$50 billion. The major control of this vast complex rests with physicians, and there are far too few of them. Authoritative voices claim the number of medical students graduated annually should be doubled. The shortage of physicians in all specialties places a high premium on their services. In fact, a seller's market exists—well illustrated by the recent experience of a prepaid group practice unit that was endeavoring to fill a specialty position in a clinic and two nearby hospitals. The physician offered the job was just completing his residency; he stated that he would consider the offer only if paid a net annual income of \$77,000 plus ample fringe benefits!

Until recently, organized medicine has opposed increasing the number of medical schools as well as making funds available for students unable to pay the exorbitant costs of medical education. Moreover, opposition to national licensure has enabled State boards to pursue a restrictive course; one State, with a population of about 2.5 million, until rather recently would license no more than 800 physicians in the entire State. But the maldistribution of physicians is not only a Southern phenomenon. The American Public Health Association reported that in the Kenwood-Oakland area of Chicago, for 50,000 residents there were only five physicians, two of whom were quite elderly (9). In 1930 the 28,000 people who lived there were served by 110 physicians.

Organized labor is actively supporting all endeavors to relieve the shortage and maldistribution of physicians. Educational opportunities must be readily available for the qualified sons and daughters of every worker, both black and white. Continued racial and religious discrimination will only prolong the agonizing shortage of all health manpower, including physicians.

#### **Job-Related Morbidity and Mortality**

I would also like to add for future deliberation the almost extinct subject of health of the worker on the job. Any discussion of comprehensive health must, by definition, include occupational health. Over the years, however, I

have encountered a disturbing lack of concern among many physicians about occupational health and a frighteningly cavalier attitude about the prevention of occupational illnesses and injuries. Annually, 14,000 to 15,000 men and women are killed on the job. This slaughter approximates the number of U.S. troops killed in 1 year in Vietnam. Two million more workers are either permanently or totally disabled, and 7 million lose a day or more of work because of injuries on the job. The rate of injuries per million man-hours worked has been steadily rising during the last decade. This toll is attributed by workers to the generalized speedups occurring throughout all industries. In addition, a decline in real earnings, occasioned by the inflationary spiral, has made overtime and moonlighting essential. The resultant fatigue slows reflexes, and the jobs take their toll.

Disturbing as these statistics may be, they understate actual conditions; there is ample reason to believe that they do not begin to indicate the severity of the situation. More than a decade ago a U.S. Department of Labor official charged that all those concerned with the collection of these figures were "playing a numbers game which constantly dealt the worker a bum hand." In the intervening 12 years nothing has changed except the worsening of conditions.

The statistics on occupational injuries may be incomplete but they are more accurate than the data on the extent and severity of occupational illnesses. For example, we are ignorant about the number of workers disabled or killed by exposure to carbon monoxide, lead, and dynamite. More than 50 percent of the illnesses are reported as diseases of the skin, but I am convinced that this number is disproportionately high.

#### **Recognition of Pneumoconioses**

Although the precise incidence and prevalence of the pneumoconioses are unknown, knowledgeable estimates can be made from a number of different sources. The protracted effort of the UMWA and the UMWA Welfare and Retirement Fund to obtain medical recognition of coal workers' pneumoconiosis as a clinical entity in the United States is an outstanding example of the problems associated with occupational dust diseases (10-13). In

1942 British investigators identified the long-known clinical entity called miners' asthma as "coal workers' pneumokoniosis" (14). The following year this disease, distinct from and in addition to classic silicosis, became compensable (15, 16). In Britain, coal workers' pneumoconiosis is a diagnosable, occupational, dust-caused disease that occurs in two distinct forms, simple and complicated (17). The disease is reported to have unique pulmonary radiological changes, which have been observed in workers exposed to hard or soft coal and some other carbon dusts both in Britain and the United States (18). Pathological studies have demonstrated lesions that are believed to be specifically characteristic (19).

In the United States today it has been conservatively estimated that 125,000 active and former coal miners have some radiographic evidence of coal workers' pneumoconiosis and that of this number nearly 50,000 may be disabled by the disease (20-30). These are frightening figures. Even more frightening is the fact that physicians are now reporting 35-year-old miners with incipient disability. Until recently, such cases rarely were found among men younger than 50 years. This development could be the prodromal warning of an epidemic outbreak of coal workers' pneumoconiosis reminiscent of the silicosis debacle at Gauley Bridge, W. Va., nearly 40 years ago.

#### **Diagnosing Coal Workers' Pneumoconiosis**

Radiographic examination of the lungs is an important component of the medical armamentarium that is essential for determining the earliest changes, severity, progression, and prevalence of coal workers' pneumoconiosis. A standardized method of describing and classifying the radiographic changes, developed by British investigators, was accepted with minor modifications by the International Labour Office Conference of Experts on Pneumoconiosis in 1950 (31). This classification was further refined in 1958 and is now designated as the International Classification of Radiographs of the Pneumoconioses, Geneva, 1958 (32). It is the generally accepted method of classifying the degree and extent of pulmonary abnormality. The classification is purely radiological and does not imply a relationship between categories

of abnormality and "suffering from pneumoconiosis," the presence of compensable disease, or a particular degree of disability.

The two major types of changes identified and defined in the international classification are simple and complicated pneumoconiosis; the "dust opacity" is described as the basic abnormality. This opacity is usually less striking than that observed in silicosis. In studies of observer error or disagreement, radiologists in Britain and elsewhere, unfamiliar with the appearance of coal workers' pneumoconiosis, have been inclined to regard the radiographic changes as trivial and not necessarily diagnostic of disease (33-36). The significance of the radiographs is apparent when comparisons are made with the autopsied lung. The exceptions are those minimal cases in which lesions are not radiologically apparent although the miners may be seriously disabled. A fairly close correlation exists between the two types of examinations in slight or moderate pneumoconiosis. The major difficulty in making a correct radiological diagnosis of complicated pneumoconiosis is in occasionally confusing it with tuberculosis or silicosis and, less often, with pulmonary malignancies. The radiograph rarely is helpful in determining the severity of the focal emphysema observed at autopsy.

The standardized radiographs and photographs illustrating the classification are readily available from the International Labour Office and are now being used successfully by an increasing number of physicians who are concerned about the need for an objective description of coal workers' pneumoconiosis. A higher consistency of proper radiographic classification than is usually obtained, particularly among less experienced observers, occurs with the use of the standard reference films. Their use is enhanced when recommended standards for the exposure and development of films are observed. It is also recommended that duplicate readings be made of all films with an additional third reading in the event of disagreement between the first two. Miniature films are not satisfactory for proper classification of coal workers' pneumoconiosis.

The experience in Britain and elsewhere with the international classification and the standard films and photographs illustrating the classifi-

cation is reported to be sufficiently helpful to warrant an intensive evaluation of the system in the United States. A limited study of the classification has been conducted by the Public Health Service in cooperation with the American College of Radiology (36). The resultant modification of the classification has been published and is readily available (37). This limited experience, however, must be broadened to include many physicians. An urgent need exists to clarify any difference of opinion concerning both classifications and their use and thereby hasten the early detection and control of coal workers' pneumoconiosis among U.S. miners.

Despite seven major conferences on coal workers' pneumoconiosis, this disease is still not well known nor widely recognized in the United States. There are many reasons why U.S. physicians have been reluctant to accept the fact that coal dust is a killer. Until recently little information has appeared in U.S. medical journals about this disease, and most earlier articles described British research and surveys. This lack of concern about coal workers' pneumoconiosis has been due, in part, to a belief that conditions reported worldwide could not exist in the United States. It is also due to the conviction that only silica and dust containing silica are injurious. Moreover, the appellation, "coal workers' pneumoconiosis," is British in origin, and some confusion exists about its applicability to the U.S. scene. This confusion is compounded by a lack of precise knowledge concerning the lethal effects of coal dust. Coal dust does not seem to be a killer until the quantity of dust in the lungs is so great that infection or infarction occurs and a chronic obstructive airway disease (bacterial or occupational bronchitis) is diagnosable (38). A growing body of evidence seems to indicate that pulmonary impairment also may be due to the dense depositions of dust around the small muscular pulmonary arteries (39). Then there are the attitudes and influence of employer-oriented physicians who avoid facing known facts about the ravages of coal dust in human lungs because to do otherwise could cost money.

Kammer, 14 years ago, in searching for answers concerning coal workers' pneumoconiosis, urged U.S. physicians to reassess earlier decisions. He stated, "Our best observations will be

those that encompass the breathless coal miner as a total man, living in a particular kind of community and working in a particular kind of industrial structure. He is a member of a social group in which there are perhaps some fixed thought patterns, particularly as relates to shortness of breath after one has worked underground for a number of years. The reassessment must be made by physicians with this sort of horizon and not by physicians acting simply as lung doctors. Full utilization must be made of good epidemiologic techniques and the best possible case judgments that give full consideration to the miner as a total man" (40).

A marked similarity exists between conditions in the United States today and in Britain 30 years ago. A pertinent comment on our 30-year lag behind the British is provided by Hunter, the world-famous British authority on occupational health (41). Ten years ago he said that although coal had been mined in Britain since 1234 it was not until 700 years later that British physicians began to accept the fact that coal dust in miners' lungs produces a slowly progressive fatal disease. He continued: "It must be admitted that medical men, by their ill-informed complacency, have a heavy load of responsibility to bear for this failure to discover the true state of affairs; a failure which constitutes what is probably the greatest disgrace in the history of British medicine." Today U.S. medicine has barely begun to overcome its ill-informed complacency and to discover the true state of affairs regarding coal workers' pneumoconiosis. Failure to take early action constitutes what may be labeled in the future as the greatest disgrace in the history of U.S. medicine. U.S. schools of medicine must accept a substantial share of this indictment.

Recognition of coal workers' pneumoconiosis by the U.S. medical profession is the first order of business. More than anything right now, coal miners need physicians who, regardless of past assumptions, are adequately trained and know how to diagnose correctly this manmade disease.

#### **Other Occupational Diseases**

I have related in some detail the situation as I know it in the coal mining industry. But similar conditions prevail for many of the same reasons in other industries. For example, we

still do not have accurate figures on the extent of silicosis among U.S. workers. The control and prevention of beryllium poisoning is receiving insignificant attention. We, in this country, had to be convinced of the dangers of asbestos by reports emanating from South Africa via the United Kingdom. Only recently have U.S. medical investigators conceded that, in addition to asbestosis, an alarmingly high rate of deaths from cancer occurs among those exposed to this dust.

Nearly 20 years ago the need to control and prevent diatomaceous-earth pneumoconiosis was the sole reason why affected workers stayed out on strike for 15 months. The scandalous extent of this disease, complicated by tuberculosis, among these workers caused such an uproar when publicized that their demands were finally met. A more current example is repudiation of the reports, appearing consistently in the U.S. literature, that textile workers in the United States do not suffer from byssinosis. We know this statement is not true.

It is my belief that the key responsibility for diagnosing the occupational dust diseases remains with radiologists, but far too few qualified radiologists are available to meet any rational demand for their services. The workers and their unions have known too well that the ravages of disability and death are the daily penalties paid for allowing the conditions that produce these diseases to prevail. Throughout the world the great plagues of poliomyelitis, typhus, malaria, and smallpox are being eradicated. The pneumoconioses are manmade plagues that can be eliminated in one generation. The help of radiologists is vital to the ultimate success of the campaign by organized labor to control and prevent these diseases.

### Conclusion

Each point I have covered is a longstanding problem that with the passage of time has worsened, partly because national priorities have permitted the expenditure of billions of dollars for precision lunar landings and billions more for precise and wanton destruction in Vietnam. Despite the plethora of skills, talents, and money devoted to such awesome precision, we as a nation have been sadly lacking in setting our house in order.

A more pervasive reason for our slowness to act may be the deadening impact of these and other billions of dollars on ethical precepts. Medicine is an ethical profession with dedicated commitments to the patient, the community, and itself, but the impact on the community, of which we as physicians also are a product, has fragmented our ethics and separated us from those in need of our skills and learning. Ethically, we may be poverty stricken because we have abjured our responsibilities in the community and in the nation and have not shared the hopes and pains of others.

### REFERENCES

- (1) Welfare and Retirement Fund: Annual report for the year ending June 30, 1967. United Mine Workers of America, Washington, D.C. August 1967.
- (2) Kerr, L. E.: Desire, expectation and reality in a union health program. *New Eng J Med* 278: 1149-1153, May 23, 1968.
- (3) Seidman, B.: The coming battle for national health insurance. *AFL-CIO Amer Federationist* 76: 8-11, January 1969.
- (4) Reuther, W.: The health care crisis: Where do we go from here? Eighth annual Bronfman lecture. *Amer J Public Health* 59: 12-20, January 1969.
- (5) Shoemaker, R. E.: Negotiating effective health care. *AFL-CIO Amer Federationist* 75: 5-9, November 1968.
- (6) Kerr, L. E.: Prepaid group practice: Essential to medical care quality and economy. *J Nat Med Assoc* 60: 415-419, September 1968.
- (7) Perrott, G. S.: The Federal employees health benefit program, sixth term coverage and utilization. *Group Health Association*, Washington, D.C., May 1967; (a) *Group Health and Welfare News*, Special Supplement, May 1967.
- (8) Perrott, G. S.: Utilization of hospital services under the Federal employees health benefits program. *Amer J Public Health* 56: 57-64 (1966).
- (9) American Public Health Association: This is the news. New York, N.Y., August 1969.
- (10) Kerr, L. E.: Black lung. *United Mine Workers of America*, Washington, D.C., 1969.
- (11) Kerr, L. E.: Coal workers' pneumoconiosis. *Industr Med Surg* 25: 355-362, August 1956.
- (12) Kerr, L. E.: Coal workers and pneumoconiosis. *Arch Environ Health* 16: 579-585, April 1968.
- (13) Kerr, L. E.: The occupational pneumoconiosis of coal miners as a public health problem. *Virginia Med Monthly* 96: 121-126, March 1969.
- (14) Great Britain, Medical Research Council: Chronic pulmonary disease in South Wales coalminers: I. Medical studies. Special Report

- Series No. 243. His Majesty's Stationery Office, London, 1942.
- (15) Fletcher, C. M.: Epidemiological studies of coal miners' pneumoconiosis in Great Britain. *Arch Industr Health* 11: 29-41, January 1955.
  - (16) Fletcher, C. M., and Gough, J.: Coalminers' pneumoconiosis. *Brit Med Bull* 7: 42-46 (1950).
  - (17) Gough, J.: Patterns in pneumoconiosis. Fourth Conference on Silicosis and Aluminum Therapy. McIntyre Research Foundation, Toronto, Canada, Jan. 28-30, 1952.
  - (18) Hugh-Jones, P.: X-ray classification, epidemiology and pathology of coal miners' pneumoconiosis in Wales. Symposium on Coal Miners' Pneumoconiosis. Golden Clinic, Elkins, W. Va., November 1952, pp. 44-49.
  - (19) Heppleston, A. G.: Coal workers' pneumoconiosis. Pathological and etiological considerations. *Arch Industr Hyg* 4: 270-288, September 1951.
  - (20) Pennsylvania Department of Health: Proceedings of the Pennsylvania Governor's Conference on Pneumoconiosis. Commonwealth of Pennsylvania, Harrisburg, 1964.
  - (21) Rogan, J.: Socioeconomics and medical aspects of coalworkers' pneumoconiosis in Great Britain. Paper presented at the West Virginia School of Medicine Centennial Symposium on Coal Workers' Pneumoconiosis. Morgantown, W. Va., May 18, 1967.
  - (22) Lieben, J.: Coal miners' pneumoconiosis in Pennsylvania, 1967. Paper presented at the West Virginia School of Medicine Centennial Symposium on Coal Workers' Pneumoconiosis, Morgantown, W. Va., May 18, 1967.
  - (23) Enterline, P. E.: Mortality among coal miners. *Amer J Public Health* 54: 758-768, May 1964.
  - (24) Brown, M. C.: Pneumoconiosis in bituminous coal miners. *Mining Cong J* 51: 44-48, August 1965.
  - (25) Hugh-Jones, P., and Fletcher, C. M.: The social consequences of pneumoconiosis among coal miners in South Wales. Medical Research Council Memorandum No. 25. Her Majesty's Stationery Office, London, 1951.
  - (26) Cochrane, A. L., Davies, I., Chapman, P. J., and Rae, S.: The prevalence of coal worker's pneumoconiosis; its measurement and significance. *Brit J Industr Med* 13: 231-250, October 1956.
  - (27) Hyatt, R. E., Kistin, A. D., and Mahon, T. K.: Respiratory disease in southern West Virginia coal miners. *Amer Rev Resp Dis* 89: 387-401, March 1964.
  - (28) Martin, J. E., Jr.: Coal miners' pneumoconiosis. *Amer J Public Health* 44: 581-591, May 1954.
  - (29) Levine, M. D., and Hunter, M. B.: Clinical study of pneumoconiosis of coal workers in Ohio River Valley. *JAMA* 163: 1-4, Jan. 5, 1957.
  - (30) Johnson, C. C., Jr.: HEW's eight-point program to combat coal miners' pneumoconiosis. Paper presented at the American Mining Congress, Pittsburgh, Pa., May 5, 1969.
  - (31) Suggested international scheme for the classification of radiographs in some of the pneumoconioses: Proceedings of the Third International Conference of Experts on Pneumoconiosis, Feb. 28-Mar. 10, 1950, Geneva. International Labour Office, London, 1953, vol. 1, pp. 130-133.
  - (32) Meetings of experts on the international classification of radiographs of the pneumoconioses: Geneva, Oct. 27-Nov. 7, 1958. *Occup Safety Health* 9: 2-8, April-June 1959.
  - (33) Gough, J., James, W. R. L., and Wentworth, J. E.: A comparison of the radiological and pathological changes in coalworkers' pneumoconiosis. *J Faculty Radiologists* 1: 28-39, July 1949.
  - (34) Cochrane, A. L., and Garland, L. H.: Observer error in the interpretation of chest films; international investigation. *Lancet* No. 6733: 505-509, Sept. 13, 1952.
  - (35) Fletcher, C. M.: Classification of roentgenograms in pneumoconiosis. *Arch Industr Health* 11: 17-28, January 1955.
  - (36) Radiologic classification of the pneumoconioses: An Anglo-American radiographic reading exercise and study of the International Labour Office (1958) classification of the pneumoconioses: A cooperative study. *Arch Environ Health* 12: 314-330, March 1966.
  - (37) Jacobson, G., Felson, B., Pendergrass, E. P., and Lainhart, W. S.: Radiologic classification of the pneumoconioses. *Med Radiogr Photogr* 44: 18-24 (1968).
  - (38) Hardy, H. L.: Current concepts of occupational lung disease of interest to the radiologist. *Seminars Roentgenology* 2: 225-234, July 1967.
  - (39) Rasmussen, D. L. et al.: Pulmonary impairment in southern West Virginia coal miners. *Amer Rev Resp Dis* 98: 658-667, October 1968.
  - (40) Kammer, A. G.: Occupational health problems of the bituminous coal miner. *Arch Industr Health* 15: 466-467, June 1957.
  - (41) Hunter, D.: Health in industry. Penguin Books Ltd., Middlesex (London), 1959, p. 209.

**Tearsheet Requests**

Lorin E. Kerr, M.D., United Mine Workers of America, 1437 K Street, NW., Washington, D.C. 20005