

The National Coal Workers' Autopsy Study

The Development and Implementation of an Occupational Necropsy Study

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Under the Federal Coal Mine Health and Safety Act of 1969, the Public Health Service has developed a nationwide autopsy program for underground coal miners. Although this is basically a service program to aid surviving relatives in establishing eligibility for "black lung" compensation through the Social Security Administration, it is hoped that a certain amount of research data will come from the study. The program itself is presented, including the development of the protocol, criteria selection, dissemination and implementation. Its relationship to a more in-depth research program is discussed. The importance of this program as the first such national occupational necropsy study is noted.

Coal is a fuel of major importance in the United States. It supplies more than half of the nation's electricity, and is necessary in the production of steel, cement, and chemicals. It is abundant and its location and composition are well known. Even with projected increases in consumption, it is estimated that the supply is adequate for 300 to 400 years.

The majority of coal mining in this coun-

try is done by traditional underground methods. This is well known to be a hazardous occupation. Historically, there has been too little legislation concerning the health and safety of coal miners and it has been slow in coming. In 1910 when the Bureau of Mines was established, it was specifically denied the right to inspect mines. The bureau was granted inspection authority in 1941, but was still denied authority to establish and enforce safety codes. Over the next 25 years beginnings toward limited inspection authority were made. This culminated in Public Law 91-173, the Federal Coal Mine Health and Safety Act, which became law on Dec 30, 1969. This act, for the first time, gave equal prominence to the hazards of both pneumoconiosis and mining accidents. Under its provisions, the Public Health Service was to intensify research, begin a national chest x-ray film survey of miners, and undertake an autopsy study. The official protocol for this autopsy study was published in final form in the *Federal Register* on May 14, 1971.

Planning of the Study

The responsibility for this work was entrusted to the Bureau of Occupational Safety and Health, which has since become known as the National Institute for Occupational Safety and Health. The actual duties were devolved upon the Appalachian Laboratory for Occupational Respiratory Diseases.

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es (ALFORD). ALFORD lacked a pathologist prior to July 1970. In collaboration with the Armed Forces Institute of Pathology, a plan for an autopsy study was eventually formulated. About this time, however, several distinguished visitors recommended that a strict research autopsy study be developed, obtaining maximum data from a few medical centers, where special techniques would be performed to detailed standards.

After legal consultation revealed that the parent law was sufficiently broad to allow such an interpretation, this advice was accepted, and planning proceeded along these lines.

Then, as sometimes happens, plans changed. A coal mine disaster occurred in Hyden, Ky, in December 1970, and under the circumstances the unfortunate miners involved were not autopsied. This disaster was of social import because survivors could have established claims for compensation had coal workers' pneumoconiosis been demonstrated.

After various consultations and directives, the planned research autopsy study became a separate project, and a larger national program of autopsies of coal miners in general, done by private pathologists, was planned. Meetings were held and various interested groups were consulted, including the Social Security Administration, the Armed Forces Institute of Pathology, and a number of pathologists involved in pulmonary research. The consultations were helpful and invariably favorable.

It must be pointed out that it is a large step from the art and science of pathology to an official legal document designed to cover all contingencies. The planning was, of necessity, more difficult since there were no established guidelines. This study would set a precedent as the first national autopsy program in which any pathologist might participate on a voluntary basis.

As part of the study, a brief personal history form was devised. This was somewhat complicated since the government has safeguards against its employees' creating unnecessary forms.

The program was finally formulated. In February 1971 various officials of the College of American Pathologists and the American Society of Clinical Pathologists

(including the Necropsy Committee of the CAP) were notified of the program and their advice and support were solicited. Then, as required by the Federal Coal Mine Health and Safety Act of 1969, the proposed autopsy protocol was published, as a notice, in the *Federal Register* of March 5, 1971. Technically, a new part was added to the federal regulations of the act covering the medical examination of coal miners. This notice was an official request for comments before publication in final form. Several comments were received suggesting minor modifications, largely in wording. These were considered and some were incorporated. The final protocol was then published as a regulation in the *Federal Register* of May 14, 1971.

Meanwhile, the American Medical Association supplied ALFORD with a listing of all pathologists (including house staff) totaling approximately 10,000. Information on the autopsy program was mailed to these pathologists in July. Also included in the distribution were approximately 60 members of the American College of Osteopathic Pathologists. The mailing included a covering letter, an explanation of the program and protocol, a sample personal history form, a reprint of the official autopsy protocol, and a return postcard. The postcard was for pathologists, who anticipated active participation, to use in obtaining forms and other information if needed. It was also hoped that this would serve as an indication of the interest in the program. Approximately 300 of these postcards have been returned and autopsy reports have begun coming in. It is anticipated that the rate of submission will steadily increase.

The Study

The study, now in effect, is basically a service program. It is hoped this program will aid surviving relatives of miners in establishing claims for "black lung" benefits through the Disability Insurance Program of the Social Security Administration. It is also hoped that a certain amount of research data will accumulate. Because of these research aspects of the program, and also because the pathologic diagnosis of coal workers' pneumoconiosis is so dependent on a

history of occupational exposure, the personal history forms included in the study must be submitted with the other materials required by the protocol.

The form also deals with some legal matters. Because of the wording of the act, it could be interpreted to mean that the results of the autopsy would be released only to the federal government. Therefore, in order to make the autopsy results more consistent with standard practices, it was necessary to specifically state the name of the local physician in order that the autopsy results could be made available to him, as is customary.

The materials submitted to the Public Health Service will, of course, be confidential. The form, however, includes a statement assuring the person permitting the autopsy that if he ever wants the information to be released, the Public Health Service will cooperate. It is also specifically stated in the form that no payment is to be made for the autopsy by the consenting party.

Because many of these provisions are legalistic in nature, a covering letter was used to explain these provisions and to solicit questions when the information on the program was distributed. It was also explained that the local autopsy permission form was not abrogated and should still be obtained as customary.

In order to have a legal reference in the study to what constitutes an accepted autopsy procedure, the 1960 Armed Forces Institute of Pathology Autopsy Manual was used. It was surprising that a more recent standard reference could not be found. This manual is now out of print, but the Pathology unit of ALFORD has a limited number which may be borrowed for a brief period.

Payment

It is hoped that the payment (generally up to \$200, with an additional \$10 if a chest x-ray film and report are submitted) authorized in the study will encourage participation in the program. When a patient dies in the hospital where an autopsy might be done in any case, this should be especially effective. It may also be used as compensation for professional services rendered when an autopsy is requested for miners who die outside the hospital. The only case in which

payment is specifically prohibited, although cases submitted would be welcome, is for autopsies done in federal installations such as the Veterans Administration Hospitals. It is of legal opinion that as a principle the federal government cannot pay for the same service twice. It should be stressed that the program now in effect is applicable only to autopsies performed on men who have worked as underground coal miners.

The Protocol

Since this is a general study and applicable to all pathologists throughout the country, it was designed to be straightforward and did not require any specialized equipment or extended effort which might discourage participation. This also avoids the considerable difficulty of standardizing even simple techniques. The program only requires paraffin blocks and slides, along with certain written materials. Also, where necessary, as in a coal mine disaster, the three pathologists now at ALFORD are prepared to assist.

Coal Workers' Pneumoconiosis

Perhaps some brief mention of coal workers' pneumoconiosis and its recognition should be made here. Lung disease in coal miners was sporadically recognized in the 19th century, but until 1940 it was generally held that silica itself was the etiologic agent. Gough, in 1940, showed that an identical condition existed in coal trimmers.¹ These men were in the now extinct occupation of adjusting the balance in the coal bunkers of ships. Despite the fact the coal they worked with was washed and low in silica these men developed pneumoconiosis.² Since then an extensive, and at times conflicting, literature has developed on the pathological condition of coal workers' pneumoconiosis.

Epidemiologic studies have also shown that coal miners have a higher death rate than other workers.³ The hypothesis has been developed that the prevalence of coal workers' pneumoconiosis is related to the type of coal mined.^{4,5}

At the present time, the diagnosis of this condition is largely made from chest roentgenograms. Certain ancillary physiologic

tests are also under active investigation. Indeed, one of the hopes for the autopsy study is this: it will allow for a better correlation of tissue and radiographic changes.

At the International Coal Workers' Pneumoconiosis Conference, in September 1971, it was apparent that distinguished pathologists with considerable experience in this field have differences as to the exact diagnosis of this condition. The Public Health Service, aware of these conflicting opinions, has awaited the problems being brought out by the national study. It is considering sponsoring a conference to clarify the nature of the lesions. Although, admittedly, these men are distinguished experts, each armed with his own facts, they may need more than diplomacy to arrive at a consensus.

It should be pointed out that coal workers' pneumoconiosis may well become a disappearing disease. The Coal Mine Health and Safety Act requires a marked reduction in the amount of respirable dust in mines

over the next few years. Special instruments are now available to measure this dust, and enforcement is proceeding. It is a bright prospect that a disease first recognized in our lifetime may well be eliminated in our lifetime.

Full information on this program, as well as the official autopsy protocol, may be obtained from the Pathology Section, ALFORD, Box 4257, Morgantown, WV a 26505.

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