CHAPTER 48

DESIGN AND OPERATION OF AN OCCUPATIONAL HEALTH PROGRAM

Jon L. Konzen, M.D.

GENERAL COMMENTS AND OBJECTIVES

An occupational health program has as its chief goal the preservation and, if possible, the improvement of the health of the work force. This work force includes everyone from the chief executive officer to the newest unskilled worker.

Such a program must contain the basic elements of prevention, acute clinical care, rehabilitation and counseling. The scope of an individual program will depend on the size of the business or industrial organization, its geographic location, the potential hazards inherent in the operation, and the philosophy of management and labor.

It is important that the scope of a program be defined in writing. This is true whether the plan is for a small single establishment involving only a few workers or a large multi-plant corporate program. The scope should include the basic objective of the program, the duties, authority and reporting relationships within the organization. Above all, the scope should clearly indicate that management understands and fully supports the program. Without the complete understanding, philosophical and financial support of management the best conceived program has little chance of success.

Occupational health programs involve multiple disciplines including occupational medicine, occupational health nursing, industrial hygiene, safety and health physics. These health professionals who are members of management must work closely not only with each other, but must have an effective relationship with other management members. This is especially true when working with members of the personnel and labor relations groups. This can be accomplished if the primary objective — the health of the worker — is continually kept in mind. This will have a positive effect not only on the worker, but it will favorably influence personnel and labor relations in such areas as workmen's compensation, sickness, absence and group insurance.

Two additional objectives are frequently being assigned to or closely coordinated with the health program in industry. One is to determine and make recommendations regarding possible effects of facility operations on the surrounding community. The second objective is to determine the health effects of the products on the consumer. The extent of the health involvement in these latter objectives will be dependent on the size, scope and level of the operation.

PRESERVATION OF EMPLOYEE HEALTH

Administration

General. Management plays a major role in any health program in industry, whether this be at the corporate level or at the plant level. The management must be fully aware and agree with the program, realize that it is preventive in nature and understand that it is not simply a tool to reduce compensation costs or improve the safety record. Management must be willing to give both the authority and the responsibility for carrying out the program to the chief health professional in the organization.

Position of Health Professionals in the Management Hierarchy

1. The physician should report to a senior member of management at both the plant and corporate level. The plant physician should report to the plant manager. The medical director at the corporate level should report either to the president or a senior vice-president.
2. The occupational health nurse, if there is a full-time physician, should report both administratively and technically to the physician. If the physician is associated with the company on a part-time basis, the nurse should report to him functionally on technical matters, but may report to the personnel manager administratively.
3. The industrial hygienist may report both at the plant and at the corporate level to the medical organizations or directly to the same reporting level as the physician. The reporting relationship is best determined on an individual company basis with consideration being given to the needs, philosophy, expertise and the full or part-time status of the personnel involved.
4. The safety professional has traditionally reported to the Personnel Department. As safety activities expand in the plant and the community, the reporting relationship must be re-examined and, if necessary, realigned to meet modern requirements.
5. The first aid personnel would report technically to the plant physician and administratively to the Personnel Department.
6. Para-medical personnel, who are also called physician's assistants, would report directly to the plant physician both technically and administratively, since a majority of such personnel are employed in plants with a full time physician.
7. The reporting relationships of other health professionals such as the health physicist and the psychologist should be determined in a similar

manner as outlined for the industrial hygienist.

It must be emphasized that whatever the reporting relationship, each health professional must be responsible for planning, justifying and administering his own budget.

There is a close interface among the disciplines of occupational medicine and nursing, industrial hygiene, safety, psychology and health physics. These disciplines may best serve the company and its employees through consolidation under one health professional, both at the local and corporate level.

Basic Concept of the Program

Pre-placement Health Evaluation. The pre-placement health evaluation should be an evaluation rather than "an examination." It has been traditional in many companies to carry out a pre-employment physical examination which consists of "seeing the doctor," a chest X ray and a urinalysis. This examination was frequently used to "weed out" hernias, bad backs or other obvious physical disabilities. The examination frequently had no other use.

A more rational approach to the pre-employment evaluation is to consider it a placement evaluation for intelligent assessment of the health status of the individual. In this era of wide medical coverage most job applicants have a reasonable knowledge of their health status. For this reason either an automated or a check-off type history will give the reviewing medical personnel sufficient information to categorize the man's health status without further examination.

Another approach to pre-employment evaluation is to combine the health questionnaire with a selected battery of tests to monitor specific organ systems such as cardiopulmonary, hemotologic and urinary systems. Paramedical personnel frequently can carry out at least part of the pre-placement evaluation. The results from such programs suggest that these types of pre-employment screening are as effective as the traditional doctor/applicant encounter in delineating health status of the applicant and in determining his physical capabilities to perform a job.

In industry where there are known hazards, it may be prudent to carry out in addition to the questionnaire and screening tests on selected organ systems, the traditional encounter with the physician so that a man's health can be further categorized. The examination will be used for job placement and as a baseline for further periodic health examinations based on work exposure.

Selective Job Placement. Practically no worker comes to a place of employment without some physical defect. Therefore, the pre-employment examination results should play a major role in the intelligent placement of a worker. If the physical requirements of the job are considered in relation to the physical limitations of the worker, it will frequently prevent accidents, ill health and increase productivity. Blanket policies should not be established for accepting or not accepting applicants with certain physical conditions. The individual's physical capabilities should be matched with the work he is expected to perform. This will permit utilization of a willing worker with some physical defects.

Periodic Health Evaluations Based on Job Exposure. The purpose of the periodic examination should be clearly defined and a program developed with the approval of management. The purpose of the periodic examination is to evaluate the health condition of the individual with emphasis placed on specific "target organs" which may be affected by actual or potential environmental exposures. Such a periodic health monitoring program will rely heavily on a carefully planned check-off questionnaire, selected tests such as audiometry for noise, spirometry for airborne particulate, and blood determinations for specific metals and/or chemicals. If all of the test parameters are normal, the physician may eliminate the personal examination and only review the record. Such a procedure lends itself to multiphasic screening.

A reasonable alternative is to broaden the scope of the periodic examination to make it a complete health appraisal of all body systems with emphasis on organ systems which may be harmed by the environmental exposures. The complete health appraisal is the more ideal approach; however, it may not be possible to carry out an in-depth health appraisal on all personnel.

Environmental Hazards in the Work Environment. Almost any environment has either potential or actual environmental hazards that need to be recognized, measured and monitored. Management and the health professionals must have a high index of suspicion in order to identify potential or actual environmental hazards. Physical agents, airborne particulate and vapors alone, or in combination, even at low concentrations, may be hazardous. First, one must consider the raw materials, the level of exposure to the worker and their potential to do harm. Next, consideration must be given as to how these raw materials are modified through intermediate steps and the exposures created. Finally, the finished product must be reviewed to determine possible effect on the worker. Each step from raw material to finished product must be evaluated under normal conditions and also under emergency conditions, such as spills, bursting or breaking.

An effective industrial hygiene baseline and periodic monitoring program can be developed by the industrial hygienist based on the above considerations.

It is important to assess the exposures in relation to the severity and length of the exposure. On this assessment, a rational approach to control by engineering methods can be undertaken. If it is demonstrated that the environment can be hazardous to health and that good engineering control cannot be effected, then an effective personal program must be initiated. Such a program must take into consideration the proper protective equipment, educational program to instruct the worker with regard to the hazards, and the necessity of wearing the protective equipment consistently and properly.

Integration of Environmental and Physical Ex-

amination Data. After in-plant environmental control has been achieved through engineering measures, or the much less desirable method of personal protective devices, continued surveillance of both the environment and the worker is necessary. The environment should be sampled periodically or, if necessary, continuously to provide an adequate characterization of breathing zone and general work area exposure concentrations. It is not adequate simply to measure the work atmosphere and on that basis conclude that there is no hazard to health "because the exposure is below the TLV."

The environmental exposure data must be integrated with the physical status data in a manner that considers length of exposure, average concentrations and peak exposures. The medical surveillance must evaluate the individual's physical condition in light of naturally occurring disease and the possibility of normal transitory physiological alterations in certain function studies. The periodic medical surveillance will generate considerable data on the exposed workers with emphasis on organ systems most likely to be affected by a given exposure.

We must characterize the exposures and physical findings in terms of the individual and the group. This characterization may be simple for the small operation with few potentially hazardous exposures. In large complex operations the characterization may involve a computerized, epidemiologically coordinated system. This system would utilize industrial engineering to characterize a worker's location and movements, continuous industrial hygiene monitoring to characterize the atmospheric exposures and multiphasic screening methods to examine the worker.

Personnel

Duties of the Health Professionals.

Plant Physician — The physician is the medical officer of the plant. In this capacity, he is responsible for advising management concerning the health condition of the workers, the health hazards that may exist in the plant and the safeguards to protect the health of the worker. In order to do his job effectively he must be fully cognizant of what the plant makes, how it is made, what raw materials are utilized, the potential and actual health hazards associated with this manufacturing and the physical requirements of the various types of jobs. The physician must have this information so he can adequately carry out the pre-placement health appraisals, periodic health examinations and the health education programs.

Most physicians who practice clinical medicine require additional orientation in the area of preventive occupational health programs. Sources of additional information for the development of a good occupational health program can be obtained from the organizations noted in the preferred reading list at the end of this chapter. Information concerning specific hazards, including the necessary industrial hygiene and medical monitoring as well as the required control measures can be obtained from the standards published by the Department of Labor in the Federal Register, the ten regional offices of the Occupational Safety and Health Administration (OSHA), U. S. Department of HEW's National Institute for Occupational Safety and Health (NIOSH) regional offices, the company's insurance carrier, the firm supplying the particular chemical or material and private consultants in occupational medicine and industrial hygiene.

The plant physician, whether part or full time, should tour the plant a minimum of once a month to review the in-plant environment and the effectiveness of environmental control. He should direct the attention of management and, if there is one, the corporate medical director to conditions which may cause adverse health effects to the work force. The doctor should follow up until adequate controls are effected. The physician, as the chief health officer of the plant, is responsible for determining the significance of occupational and environmental sources of disease.

The plant physician is not expected to render any specialized treatment such as major surgery, treatment of severe eye injuries or other conditions beyond his field of training or experience. These cases should be referred to recognized medical specialists preferably those certified by the boards of the various specialties. However, all cases of occupational injury or disease should be examined by the plant physician at frequent intervals regardless of who is rendering the actual treatment.

Employees' physical impairments or diseases which are non-occupational are also an important phase of the plant physician's responsibilities. The physician should consult with the employees who seek his advice regarding non-occupational conditions, but should confine treatment to that which is necessary to relieve the emergency condition or to enable the employee to finish his shift. These employees should be referred promptly to their family physician. In some isolated areas the plant physician may care for both occupational and non-occupational related health conditions of the workers and possibly their families. In these situations there must be clear ground rules established between the physician, the company and the local medical society regarding delivery of health care.

It is the plant physician's responsibility to notify the local health department in cases of reportable communicable diseases.

All pre-placement, periodic, transfer and reentrance health examinations are to be conducted or reviewed by the plant physician. All examinations should be conducted in privacy with only the patient present. Employees should not be examined "en masse." All female employees should be examined in the presence of a third party, preferably a nurse.

The plant physician should arrange and participate in First Aid courses for key plant personnel given under the auspices of the American Red Cross or other similar service organizations.

The plant physician should be responsible for and supervise the keeping of accurate, complete and legible medical records. The records of each individual employee are confidential. The

local company physician, in accordance with applicable policy, should determine the nature and amount of medical information that can be released to others. Medical personnel should not discuss an applicant's or an employee's health or medical records with other personnel except as required in the performance of their duty. Specific medical records of injury or occupational disease must be made available under the 1970 Occupational Safety and Health Act, and in cases involving workmen's compensation. Portions of the medical records dealing with occupational illness and injury must be discussed with the plant safety supervisor in order that he can carry out his functions.

The physician's opinions and recommendations should be based entirely upon the facts as determined by careful investigation of each incident, case or condition. Any biased judgment or opinion which might be used to further the company's or the employee's interest at the expense of the other party is considered unprofessional and highly inappropriate.

Occupational Health Nurse — The occupational health nurse is a part of the management team. As a health professional it is important that she be objective in all of her professional duties. The nurse should be trained, and if appropriate, certified to conduct the specialized in-plant testing required in the program. Her duties can be grouped in the areas of prevention, treatment, rehabilitation and education.

In the area of prevention, she plays a vital rqle in the pre-placement and periodic health examination programs by conducting preliminary testing and assisting in the completion of medical questionnaires. Her duties may include preliminary review of test results to screen out the obvious normal findings. This will permit the doctor to better utilize his time in reviewing the abnormal findings.

A good industrial nurse can handle many of the minor accidents and injuries which occur in any industrial setting. These treatments are carried out under the direction and written orders of the physician. It is most important that every health facility have a set of written orders defining the limits and responsibilities of the nurse with regard to treating the patient, and that the occupational health nurse is currently licensed to practice in the state in which she is employed.

The nurse plays a key role in rehabilitation of the injured worker by supervising appropriate exercises, whirlpool or heat treatments in the unit. This rehabilitation will aid in the early return to work of the injured employee.

The nurse plays a vital role in the educational program to inform the employee of potential health hazards of work and the signs and symptoms of over-exposure. Frequently she fits and instructs the worker in the proper use of personal protective equipment.

The nurse can serve as an effective health counselor for personal physical and mental health problems. She can be especially effective in the areas of alcohol and drug abuse.

The keeping of good clinical medical records as well as the records prescribed under the Occupational Health and Safety Act fall largely to the nurse. She must have knowledge of the in-plant environment so she can intelligently assess complaints. This will permit proper recordkeeping and assist in early recognition, and prompt medical management of occupationally related health conditions.

Small plants frequently employ only part-time nursing service. The nurse coverage should be scheduled to cover more than one shift in a multi-shift operation. Her period in the plant should be long enough to accomplish all her duties. In most operations, each plant visit should be at least two hours in length.

Industrial Hygienist — The industrial hygienist in most companies will be located at either the central office or at a divisional office location. A few organizations have a qualified industrial hygienist located at the plant level. Many companies must rely on outside industrial hygiene consultation through their insurance carrier, state agencies or private consulting firms.

The duties of the industrial hygienist are to make the corporate management aware of potential in-plant environmental hazards, measure these hazards, recommend appropriate engineering control and periodically monitor the controlled environment. The industrial hygienist, physician and nurse must work closely together to achieve the proper control of the environment and maintain it. The industrial hygienist's specialized knowledge in the area of toxicology will be of great benefit to the physician and the nurse. He will often act as a liaison between the medical group and the actual plant production people in areas of common concern.

Safety Coordinator — The safety coordinator has the prime responsibility for the safety program of the plant. The two major areas of this responsibility are employee education in safe work practices and property safety.

The safety supervisor must work closely with the Medical Service of the plant to review all accidents and illnesses so unsafe conditions can be corrected and the affected employees be re-educated promptly to prevent further accidents.

First Aid Personnel — In all plants, and especially those without full nurse coverage, employees should be selected and trained as first aid personnel to provide emergency first aid when trained professionals are not present in the plant. These employees should attend and obtain certification from an approved first aid course such as is given under the auspices of the American Red Cross or other similar service organizations. The course must meet the standards for first aid training under the 1970 Occupational Safety and Health Act. The coordination of training these employees is the responsibility of the plant physician.

Other Health Professionals — Other health professionals who may be involved in plant operations from time to time include the health physicist and the doctor's assistant. The need for these personnel will be governed by the size and type of operation. The use of a physician's assistant must be governed by the availability of proper

physician supervision.

Facilities

The location, size, layout and equipment of an in-plant medical facility should be based on the size of the operation, the number of employees and the activities of the plant. It is especially important in new plant design to plan for possible future expansion.

The medical facility should be located on the first floor of a multi-floor complex with consideration given to proximity of elevator service which will accommodate a wheeled stretcher. An electric cart to serve as an in-plant ambulance may be necessary if the plant is unusually large. The medical facility should be located within easy access to the work areas. There should be a second entrance to a driveway which is free of architectural barriers where an ambulance can readily load an ill or injured employee.

The size of the unit is governed by the extent of the in-plant program. There are various formulas for determining unit size, but a reasonable rule of thumb is to include approximately 1 to 1.5 square feet for each employee up to 1000 employees. Over 1000 employees, the square footage per employee can be appropriately reduced.

The layout of the unit should permit wheeled stretchers to negotiate all turns and enter all rooms. It is important to remember that these units serve several functions: prevention, treatment and rehabilitation. In large units where there is one or more full time nurses as well as a full time physician, the floor plan should be designed to separate the preventive activities from the treatment activities. Various layouts have been devised for this purpose. There is no one best layout.

Privacy in an in-plant medical unit should equal that of the private physician's office. Privacy can be accomplished even when examining large numbers of pre-placement or periodic applicants. One commonly used method is to have two or three small dressing cubicles adjacent to the examining room. Each one of these cubicles has two doors. One door leads from the hall into the cubicle. The second door opens into the physician's examining room. The patient enters the cubicle, closes the hall door, locks it, disrobes and awaits the physician. The physician controls the movement from the cubicle into the examining room since no door knob is placed on the cubicle side of the door.

The larger units may have specialized rooms for minor treatment of illness or injury, a special room where minor suturing can be carried out under good aseptic conditions and a ward for observation of patients. It is most important that if there is more than one bed in a room that each bed be enclosed entirely by a cubicle curtain. All units, regardless of size, must have facilities for hand washing, toilet rooms and storage. In very small plants where there are fifty or less employees, the medical unit which is to serve primarily for first aid and health counseling may consist of only one room. The room requires a sink, dressing cabinet, industrial treatment chair, examination table, desk and files for maintaining the confidential medical records. All other preventive, treatment and rehabilitative activities would be carried out at a nearby medical facility.

For a plant of 200 individuals or less, a three-room unit consisting of a doctor's office/examining room, minor treatment room and nurse's office/waiting room would be suitable. The doctor's office/examining room would also be used as a major treatment room for a severely injured patient prior to transport to the hospital. Each treatment and/or examination room should have running water, adequate lighting and ventilation.

In a small plant which employs less than 200 workers, where the physician does not come to the plant for other than monthly inspections, it may be appropriate for the nurse to carry out the preliminary health testing at the plant. The results would be forwarded to the physician's private office for completion of the examination. Most equipment commonly used in preliminary testing such as the mechanical sight screener, spirometer, audiometer and audiometric booth are not usually found in the average physician's private office. Blood can be drawn either at the physician's office or in the plant. X-ray studies would be made at an outside facility.

The effectiveness of the occupational medical program is usually increased by carrying out as much of the preventive, rehabilitative and educational program as possible in the plant. This would include all parts of the examination with the possible exception of X ray. Such a program would require frequent plant visits by the physician.

The training, background and length of time that the medical personnel are at the plant should determine the type and sophistication of emergency and therapeutic medical equipment and drugs that will be maintained on the premises.

Records

The medical records which must be maintained on an individual must characterize his health at the beginning, periodically throughout and at termination of employment. A record of all occupational injuries, illnesses and treatments must be maintained.

It is customary to have a pre-placement health examination form which includes a check-off health questionnaire that reviews the patient's past environmental exposures, family history, personal medical history and provides a section to record the objective medical findings. In designing such a form it is important to consider the educational status of the average applicant so that the history portion can be completed by the applicant with a minimum of assistance from the medical personnel. Newly designed forms should be computer compatible even if there are no immediate plans to use data processing equipment for storage, retrieval or use of the records.

A similar questionnaire and selected testing procedure approach may be used for the periodic health evaluation.

The forms should be designed with sufficient room so that all data can be entered easily and reviewed at a glance. The abnormal findings should stand out. There should be sufficient area for

comment and elaboration of all abnormal findings. Laboratory and other testing data may be displayed in tabular form.

Internal Statistical Reports. It is useful to have internal statistical reporting covering the costs, patient load and the various tests that are performed. An objective review of this data will permit an evaluation of the effectiveness of the program, enable determination of accurate costs for medical services and assist in realistic budget development.

Occupationally Related Accidents and Illness Investigation Reports. Early determination of the causes of occupational injury and illness is assisted by an intelligent accident or illness report that is completed jointly by the first-line supervisor, the plant safety coordinator and the medical service.

If each of these disciplines intelligently and accurately complete their portion of the report, unsuspected problem areas may be identified and controlled. They will assist in reducing accidents by making the entire plant more aware of the in-plant environment. It will also demonstrate to the employees that the company takes the matter of their health and safety seriously. Such reports with certain modifications can be used as workmen's compensation reports and the Occupational Safety and Health Administration Form #101.

Records for Compliance with the 1970 Williams-Steiger Occupational Safety and Health Act. The Occupational Safety and Health Act of 1970 states that all illnesses and injuries which require more than simple first aid must be recorded within six days after the illness or injury becomes known. OSHA Form 100 or an equivalent form or method approved by the Secretary of Labor may be used. The law further requires that an accident report be completed on each recordable injury or illness. OSHA Form 101 is provided for this purpose. Annually a summary which can be completed on OSHA Form 102 must be posted in a conspicuous place for not less than thirty days. This form must be posted not later than the first of February of the year following the covered period. Some selected plants will be requested to complete OSHA Form 103 for submission to the Department of Labor. This is a more detailed summary of the information reported on OSHA Form 102. The details for recordkeeping requirements are summarized by the Department of Labor in the booklet RECORDKEEPING REQUIREMENTS UNDER THE WILLIAMS-STEIGER OCCUPATIONAL SAFETY & HEALTH ACT OF 1970.

Industrial Hygiene Records. Industrial hygiene sampling records must be available for review by the Secretary of Labor or his representative. The samples should be taken in sufficient numbers and locations to characterize in-plant exposure to people.

Industrial hygiene reports which are made to management should be more than a list of numeric values. The report should interpret the data from the standpoint of ceiling values, time weighted exposures and excursion peaks. The reports should discuss the corrective action which would be appropriate in relation to the exposures. It should be emphasized that the acceptable exposure concentration used in industrial hygiene, commonly called threshold limit values, are guidelines for reasonable exposures and are not absolute safe or unsafe limits. These levels should be discussed in terms of the standards which have been and are continuing to be published by the Secretary of Labor. The Federal Register should be consulted on a continuing basis for published changes.

Industrial Hygiene

There are three basic types of industrial hygiene surveys from a physician's standpoint. These include baselining of an operation, periodic monitoring of an operation and emergency monitoring of an operation. Baselining is an in-depth evaluation to characterize exposures throughout the manufacturing facilities. To carry out such a survey it is usually appropriate for the hygienist and frequently the physician to make a preliminary walk-through survey of the facilities to review raw, intermediate and end products of a manufacturing operation in order to identify actual and potential exposures under normal and abnormal conditions. After the walk-through has been completed and evaluated, the industrial hygienist will move in with the appropriate equipment and complete the baseline survey. Periodic monitoring of the plant is carried out in essentially the same way except the initial walk-through may be eliminated and the number of individual samples required usually can be reduced. The third type of industrial hygiene survey is the emergency survey. Medical review of the first-line supervisor's accident report may require immediate evaluation and sampling to determine if a particular operation or exposure is creating a hazardous condition. Such emergency surveys can be kept to a minimum if the baseline and periodic surveys are well planned and executed.

It is most important that the physician and industrial hygienist be consulted during initial planning and pilot stages of a new process or operation so that necessary environmental control and medical monitoring can be included in the economic feasibility study. It is possible that when the environmental concerns are considered, a product line may be unprofitable. Environmental and occupational health are necessary costs of doing business.

There should be a procedure by which the plant or corporate engineering coordinates with the medical and industrial hygiene services so that sufficient environmental consideration is given to a process change and to the purchase of new products and equipment. This will assure that engineering controls will be added or modified in order to control any potential environmental hazards. It is an old axiom that minimal changes in the process can cause maximal environmental problems.

Safety

Safety must play a major role in a well rounded health program (see Chapter 47). A

safety program should cover not only property, machine guarding, fire safety and the like, but must include the education of management as well as the work force in safe working procedures. The safety program begins when the worker is first employed. It is important to have on-the-job training programs that are directed to the individual to inform him of safety hazards in his particular job, as well as an indoctrination in the general aspects of safe work practices. This will require that a comprehensive job safety analysis be performed on all operations. Further, there must be a systematic inspection of new, revised and existing production and safety equipment to identify potential safety hazards and to assure compliance with governmental requirements. Another important task of the safety supervisor is a systematic accident investigation program coordinated with first-line supervision and the medical service.

Special Programs

Programs Directed at Specific Hazards. The preplacement and periodic examinations mentioned earlier in this chapter are important but not all inclusive parts of special programs to protect workers from specific hazards in the work place. The examinations are limited to assisting in identification of workers who should not be exposed to certain hazards and reveal early adverse health effects. Special programs will vary in number and complexity depending on the hazard, type of exposure and number of workers involved. All the special programs have certain things in common which include recognition of the hazard, measurement of the hazard, control of hazard by engineering or personal protective devices, medical monitoring of the workers and education of the employee with regard to the health and safety implications presented by the hazard. It cannot be stressed too vigorously that the educational part of the program and its resulting motivational influence is one of the most important parts of any special program. If the worker cannot be properly motivated to cooperate in the protection of his health, costly industrial hygiene engineering, control devices, personal protection equipment and medical monitoring will have only limited effectiveness. The employee does have specific responsibilities under Public Law 91-596 (OSHA) to achieve and maintain safe and healthful working conditions.

Some of the more common specific hazard control programs include hearing conservation against noise; eye protection against flying particulate; respiratory protection against such airborne agents as lead, silica, asbestos, cotton and solvent vapor; thermal stress protection against heat or cold; and dermal protection against skin sensitizers or irritants (see Chapter 34). Immunization programs directed at such job related diseases as tetanus and in certain industries, typhoid, are often indicated. A well rehearsed and frequently reviewed tank entry program which incorporates segments of other hazard control is a common requirement in industry.

Medical Disaster Control. Medical disaster, either man-made or natural, can occur. All office complexes and plants should have plans which will permit rapid evaluation, effective first aid, evacuation and transportation of injured personnel to a definitive treating facility. The elaborateness of the disaster control plan will depend on the size of the operation.

Alcohol and Drug Abuse. Programs to combat alcohol and drug abuse are important and necessary. These specialized programs require an interdisciplinary effort between personnel and medical departments and the community. Such programs should clearly define company policy, and include the detailed procedure for handling personnel involved in these abuses. These programs should be designed to treat drug and alcohol problems in the same manner as other chronic diseases.

Consultation to Management on Group Insurance Benefits. Management should review the group health insurance benefit plan with the medical service. Medical expertise will be of assistance in formulating the most comprehensive plan for the least amount of money.

Absentee Control. Absentee control is a by-product of a good medical program. Early recognition of job-related and non job-related conditions can assist in rapid treatment and early return to the job.

A day-to-day evaluation of sickness absence takes a careful, well thought out form to obtain the necessary confidential medical information and establish a good rapport between the private physician and the company medical service. The program will aid in preventing unwarranted and excessively long sickness absences. It will assist the plant physician in intelligently placing the returning worker if job change is necessary.

Occupational Mental Healtht. Mental health is an area of increasing concern of industry today. An emotionally affected worker who is troubled by home or work problems is not an efficient or safe worker. It is most important that the medical service programs train first-line supervision to recognize symptoms of emotional ill health, and refer employees promptly to the medical service. This will permit professional evaluation and counseling. If necessary, prompt referral to specialized mental health care can effectively be carried out by the medical service. It should be emphasized that the first-line supervisor should not try to diagnose or "treat" emotional illness, but should promptly refer the employee. Evaluation and counseling take time in the medical facility, but this service can render great dividends in terms of the individual as well as his value to the company.

Possible Health Effect of the Facility Operation on the Community

Effluents from a Facility. Effluents which are emitted from a plant to the atmosphere, to waste water, or by solid waste disposal must be monitored for legal reasons and to protect the health of the community. It is important to sample these effluents at the source of emission, as well as in the community since many materials may undergo a chemical change which would render them either more or less hazardous. Frequently emissions may be relatively unique to

a particular facility operation. For this reason, there must be close cooperation between the environmental engineering group and the medical group so that representative samples are obtained, and meaningful evaluation of the samples are carried out. At times by using toxicological consultation, the physician may be able to advise on the health effect of materials. At other times, it may be necessary to carry out animal studies or, in extreme cases, to evaluate the health effect on the community by epidemiological studies.

Social Impact of Opening or Enlarging Operations in a Community. The social impact of a plant on the community, particularly if it is a small community, may be appreciable. The medical service should be consulted during the initial planning stages of a new or enlarged facility to assist in the determination of adequate medical coverage for the in-plant operations and to assess the impact of the influx of a work force on the local medical support. In particularly small or isolated communities, it may be necessary to work with the local medical society in order to either encourage, and at times financially support expansion of local medical services, or offer comprehensive medical service to the employee and his family through the company.

Possible Health Effect of Products on the Consumer

Health Evaluation of New or Modified Products. For years many large progressive companies have carried out a joint effort with toxicologists and medical personnel to conduct studies on new or modified products from the conceptional stage through final product marketing. It is becoming increasingly clear that such procedures will have to be incorporated in product development programs of still more industries. Possible health effects must be considered as part of the normal product development process. The possible health effect evaluations of new or modified products may take place within the company or may be contracted to a variety of institutions who are equipped to carry out toxicological literature reviews, animal studies, human studies and limited field testing.

Whether evaluations are carried out within the company or through consultants, it is most important that a team within the company representing medical, technical and toxicological expertise be established to determine the need, scope and design of any research study.

Evaluation of Present Products. At times it is necessary to carry out a critical health effect evaluation of products which have been marketed for various periods of time. These health effect evaluations will utilize the same techniques as used for new or modified products. In addition, the health history of employees exposed to the finished product would be of value in assessing the health effect. An additional important tool in determining health effect on the consumer is an objective and representative analysis of customer complaints from a health standpoint. It is important when using customer complaints to carefully document the adverse health effects in relation to the use or misuse of the product. It is also important to develop mechanisms which will surface customer complaints effectively in all areas where the product is marketed.

Preferred Reading

1. ALCOHOLICS ANONYMOUS WORLD SERVICES, INC.: Box 459, Grand Central Post Office, New York, N. Y. 10017 (see Publications List).
2. AMERICAN ACADEMY OF OPTHALMOLOGY & OTOLARYNGOLOGY: *Guide for Conservation of Hearing in Noise,* 15 Second Street, S.W., Rochester, Minn. 55901 — 1969.
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