Hospital Occupational Health and Safety

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health

Copies of all seven volumes of the NIOSH Hospital Occupational Health Services Study from which the principles and guidelines were derived are available from:

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HOSPITAL OCCUPATIONAL HEALTH AND SAFETY

Based on Principles and Guidelines from the NIOSH Hospital Services Study

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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Is your hospital a safe place to work?

Are your employees taught how to protect themselves from hazards at work?

Can your laboratories pass a safety inspection?

Are you harassed by minor injuries and illnesses occurring at work?

What is your absenteeism rate?

What are your workers' compensation costs?

How about your staff turnover rates?

Have you provided a healthy and safe working environment for all male and female workers?

If you are looking for answers to these questions, you will want to know more about developing an occupational safety and health program for hospital workers or you may want to improve on the employee health service you now operate.

DHEW (NIOSH) Publication No. 77-141

ABSTRACT

This brochure summarizes the principles and guidelines derived from the NIOSH Hospital Occupational Health Services Study, conducted by the National Institute for Occupational Safety and Health, U.S. Department of Health, Education, and Welfare. The study surveyed programs for employee safety and health in almost 4,000 general hospitals.

NIOSH
Principles and Guidelines
for
Hospital Occupational Health and Safety Programs

An effective hospital occupational health and safety program must conform to existing occupational health and safety laws and should provide implementation of the following basic principles for quality care:

PRINCIPLES

I. PREPLACEMENT MEDICAL EXAMINATIONS
II. PERIODIC EXAMINATIONS
III. HEALTH AND SAFETY EDUCATION
IV. IMMUNIZATIONS
V. CARE OF ILLNESS AND INJURY AT WORK
VI. HEALTH COUNSELING
VII. ENVIRONMENTAL CONTROL AND SURVEILLANCE
VIII. HEALTH AND SAFETY RECORDS SYSTEM
IX. COORDINATED PLANNING WITH OTHER HOSPITAL DEPARTMENTS AND SERVICES

GUIDELINES

I. PREPLACEMENT MEDICAL EXAMINATIONS, PERFORMED ON ALL NEW EMPLOYEES BY A HEALTH CARE PROFESSIONAL TO INCLUDE:

A. History-taking, including family history, past medical history, occupational history, review of systems, and the details of present complaints, if any.

B. Physical examination, including:

1. Height, weight, temperature, pulse, and blood pressure measurements.
2. Vision and hearing tests.
3. Examination of skin, eyes, ears, nose, teeth and mouth, chest (lungs and heart), breasts, lymph nodes, peripheral blood vessels, abdomen, inguinal regions, genitalia, rectum, spine, extremities.

4. Assessment of obvious emotional and mental manifestations.

C. Additional procedures::

Blood tests for:

Hemoglobin or hematocrit determination.
Total and differential leukocyte counts.
Serologic test for syphilis.
Blood chemistry determinations as deemed necessary by the examiner.

Urinalysis, including microscopic examination.

Chest x-ray

Tuberculin skin test (unless known to be positive).

Cervical cytology (for females age 18 or older unless performed within past year).

Cervical culture for Neisseria gonorrhea.

Electrocardiogram.

D. Other procedures and consultations as indicated by history, physical findings, or *special job requirements.**

II. PERIODIC HEALTH MAINTENANCE PROCEDURES

A. General examination as outlined under I (above) should be repeated according to the following age-related schedule: triennially to age 30, biennially to age 40, annually thereafter, and, under certain circumstances, on retirement. In the intervals between general examinations, modern standards for early detection of important diseases call for cervical cytology (with culture for N. gonorrhea, if indicated) annually, and the tuberculin skin test annually (unless known positive) for employees in close contact with hospitalized patients. Employees having had close contact with a recognized case of tuberculosis should have this test (or a chest x-ray, if known to be tuberculin positive) performed at more frequent intervals.

B. Periodic health appraisals should be undertaken by a health professional at appropriate intervals to determine whether the employee's health continues to be compatible with his job assignment.

* See Addendum

The frequency and extent of these appraisals should be determined by various factors, including the employee's age, his physical condition, his job assignment, and hazards known to be associated with his work. Special attention must be given to evolving requirements under occupational safety and health legislation.

C. Special health appraisals: Employees should be interviewed or examined, as the situation dictates, by a health professional after an illness-absence of about three to five work days. When transfer of an employee to another department or service is being considered, his/her health records should be reviewed, further action should be taken if indicated, and notation should be made of the medical suitability of the employee for the proposed new assignment.*

It is recommended that an occupational physician, an occupational health nurse, or a qualified nurse practitioner with understanding of occupational health be assigned to the employee health unit.

III. HEALTH AND SAFETY EDUCATION

An education program, directed by a knowledgeable person, shall consistently and continuously provide health, safety, and environmental information for all employees. The instruction should include job orientation, safe working habits, relevant health information, and use of the occupational health unit for reporting injury and illness. Employees, both male and female, in the reproductive years should be informed and advised concerning known and potential work-related hazards affecting conception and pregnancy.*

The personal relationship established in the course of a preplacement or periodic examination is the most natural and most effective opportunity for medical professionals to provide health and safety education.

*See Addendum.

It is recommended that the occupational physician, the occupational health nurse and the safety environmentalist and/or the industrial hygienist work collaboratively to coordinate health and safety education.

IV. IMMUNIZATION PRACTICES

A. Recommended immunizations for hospital workers:
   1. Smallpox every three years for employees exposed to patients.
   2. Diphtheria-tetanus booster every ten years.
   3. Oral polio, complete series; no booster dose needed.
   4. Special immunizations as indicated by epidemics or unusual laboratory conditions.

B. A system for up-dating immunizations should be maintained. It is suggested that the immunization practices be commensurate with current CDC* policies.

V. CARE OF ILLNESS AND INJURY AT WORK

A. Adequate arrangements should be provided to give occupational medical, surgical, psychological, and rehabilitative services to all employees.

B. A specific, identified site should be designated for this purpose.

C. A panel of competent specialized medical and surgical consultants from the hospital staff or from the larger medical community should be available.

D. A formalized procedure should be maintained for contacting private physicians or clinics in the interest of the employee.

E. Adequate follow-up procedures for ensuring con-

*The Center for Disease Control (CDC), Public Health Service, U.S. Department of Health, Education, and Welfare, Atlanta, Georgia.

tinuity of care should be maintained for all employees.

F. Treatment and reporting of occupational injuries and illnesses should conform to the state's compensation laws and to OSHA standards under PL 91-596, the Occupational Safety and Health Act of 1970.

VI. PERSONAL HEALTH COUNSELING

A. A counseling program for personal problems should be made available to provide health counseling for employees having difficulty with weight control or with addictive problems, including tobacco, drugs, and alcohol. Personal counseling on a variety of subjects, e.g., pregnancy, retirement, has been found to be helpful.

B. A formalized system for referral and follow-up when appropriate should be provided for employees having personal problems which need professional intervention unavailable in the occupational health facility.

VII. ENVIRONMENTAL CONTROL AND SURVEILLANCE

A. The environmental control and surveillance service should be coordinated and directed by an individual or consultant capable of avoiding or limiting harmful occupational exposures. Special attention should be given to women of child-bearing age to assure protection against hospital hazards and exposures which are known or thought to predispose women giving birth to infants having congenital anomalies.*

B. A competent individual should be responsible for the safety aspects of both ionizing and nonionizing radiation, and the services of a consulting health physicist should be available as needed, and as required by law.

C. Compliance with state and federal regulations pertaining to radiation hazards must be maintained.

* See Addendum.

VIII. HEALTH AND SAFETY RECORDS SYSTEM

A. For each employee a health record should be maintained in the health unit, to include: all examinations, reports of injury and illness, reports to and from physicians, radiation exposure, and information on other safety and health matters relating to the individual. Pertinent environmental exposure records including those exposure records required by law should be available to the staff of the occupational health unit.

B. Reports should be prepared monthly and yearly to show injury and illness rates, and also accident facts. Records should be maintained on the monitoring and on the control of environmental hazards, according to OSHA standards.

C. Employees' medical records should be handled confidentially and should be available only to appropriate medical personnel unless the specific written consent of the employee has been secured or unless reports of relevant portions of these records are required by law.

IX. COORDINATED PLANNING WITH OTHER HOSPITAL DEPARTMENTS AND SERVICES

A. A committee representative of various hospital departments, services, and labor unions should be available to consult on employee health policies as they pertain to these departments and services.

B. Specialized committees, such as the safety committee and the infection control committee, should consider the health of all hospital employees in their planning.

C. A representative of the hospital's occupational health program should be on the Safety Committee, the Infection Control Committee, and other appropriate Hospital Committees.

Addendum

Waste Anesthetic Gases: Evaluation and Control Measures

1. Introduction

Halothane and nitrous oxide are currently the two most widely used inhalation anesthetic agents in the United States. Diethyl ether was at one time the anesthetic agent receiving the most extensive use and therefore, the principal source of waste anesthetic gases. Although trichloroethylene is not commonly used in operating rooms, it is frequently used in emergency and out-patient departments and to some extent in obstetrical suites. The principal source of waste anesthetic gases in the hospital operating room suite is leakage from the anesthesia equipment which, in most cases, is associated with the work practices and habits of the anesthesiologists and nurse anesthetists.

In 1974 and 1975 the results of a national study of work-related diseases among hospital operating room female personnel indicated that female anesthesiologists, nurse-anesthetists, and other personnel in the operating room exposed group (first trimester of pregnancy and preceding year), were subject to a statistically significant increased risk of spontaneous abortion. It was also shown that there was evidence of an increased risk of congenital abnormalities among the live-born babies of exposed female respondents in the survey.

Several anesthetic agents have chemical structures similar to known human carcinogens and this has generated some concern over reported increased cancer rates and adverse effects on reproduction. Recent epidemiological studies have suggested increased incidences of embryo toxicity, liver and kidney disease, and some evidence of increased cancer rates among groups of female personnel working in the operating room. Studies have also shown a higher incidence of miscarriage in the wives of male operating room personnel where the wife was not exposed.

This and other evidence which appears in the NIOSH publication, "Criteria for a Recommended Standard... Occupational Exposure to Waste Anesthetic Gases and Vapors," Publication No. 77-140, should be considered sufficiently significant to urge the prompt application of scavenging techniques for waste anesthetic gases and the institution of a comprehensive occupational safety and health program to safeguard hospital personnel and professional visiting staff who may be exposed.

The NIOSH publication, "Development and Evaluation of Methods for the Elimination of Waste Anesthetic Gases and Vapors in Hospitals," Publication No. 75-137, presents the information concerning necessary control methods which may be employed to establish and maintain low concentrations of anesthetic gas. Techniques for scavenging, equipment maintenance, air monitoring, and special "low leakage" anesthesia practices are explained. Various scavenging systems are illustrated, procedures for initiating a scavenging program are detailed, and the results of gas distribution in air monitoring studies are presented.

It is recommended that operating room supervisors, chief nurses, and administrators become familiar with appropriate scavenging systems to control the environment.

NIOSH has also published a study on the "Effects of Trace Concentrations of Anesthetic Gas on the Behavioral Performance of Operating Room Personnel," Publication No. 76-169. Copies of the above three mentioned publications are available from NIOSH at the address listed inside the front cover of this pamphlet.

2. Environmental Monitoring

As part of a total occupational safety and health program, enviornmental monitoring should be instituted and supervised by a knowledgeable individual familiar with sampling and monitoring techniques or by a professional industrial hygienist. The agent or agents to be monitored and the method chosen will depend on the frequency of the agents' use, availability of sampling and analysis instruments and whether the facility chooses to initiate its own monitoring program or to seek outside consultation from a state or local health department, a university environmental health service or a commercial consultant.

3. Medical Surveillance

Medical surveillance should be made available to all employees subject to occupational exposures to waste anesthetic gases including operating room personnel, dental and veterinarian personnel. A complete pre-placement medical examination including a comprehensive occupational history should be performed on all new employees. Periodic health appraisals should be undertaken at appropriate intervals as determined by a responsible physician.

A complete history, including family and genetic history, medical and occupational history, should be obtained and kept in the employee's medical record. Information on the outcome of all pregnancies of personnel or their spouses should receive special attention. This also applies to the hepatic, renal and hematopoietic medical history as all of these organ systems may be potentially affected by inhalation of anesthetic agents. It is advisable to institute a periodic medical surveillance program for liver function and kidney function testing.

4. Recordkeeping

Records of all collected air samples should be maintained, including the date of the sample, sampling method, sample location, analytical method and measured concentrations. Such information should be referenced in the employees' medical records. The administrator of the operating room who is responsible for the health and safety of the employees must be constantly informed of changes in either environmental results or clinical changes in the employee. The employee must be notified and informed of these changes.

5. Health Education and Related Training of Employees

Suitable and sufficient training in the relevant aspects of anesthetic gases as a potentially harmful agent should be given to all persons employed in the operating room suite or who frequently enter the area. The objectives of the training should be:

a. To inform employees of the potential risks to health inherent in their work;

b. To acquaint them of the measures taken and the means available to minimize those risks;

c. To secure their cooperation in the adoption of safe working practices; and

d. To familiarize them with the available environmental and medical monitoring arrangements.

Safe work practices and potential health hazards should be included as part of employee orientation. Repeated on-the-job training should be carried out on a regular basis with attendance recorded.

Each employee who may be potentially exposed to chronic inhalation of anesthetic gases must be advised of the potential effects, such as spontaneous abortion, congenital abnormalities, and possible effects on their liver and kidneys. All new employees, male and female, must be taught how to protect themselves in the surgical suite against exposure of toxic gases; the employee must be advised about the necessity to report a new exposure or incident, to report suspected pregnancy in self or spouse and the need for possible transfer to a safer occupation. Employees planning to have children must be informed of the potential risk to the male chromosome and the potential teratogenic effects. Any abnormal outcome of pregnancies of employees or of the spouse of the employees should be documented as a part of the employees' medical and genetic record.

This training should be updated at least annually and at any other time considered appropriate by physicians and nurses responsible for the occupational safety and health education and training of the employee group.

It is essential that:

- All the training objectives listed above are met.

- All employees receive training adequate for their particular job and for their general conduct in the operating suite.

- Sufficient refresher training is given to ensure that initial information is remembered. Supervisors should be watchful to note misunderstandings and misinterpretation of instructions and report to administrators so that further refresher training can be implemented.

- Each worker shall be instructed as to the availability of information about the harmful effects of the waste gases. This shall be kept on file and accessible to the worker at each place of employment where potential exposure to waste anesthetic gases exists.

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NIOSH regional offices can provide information on the OCCUPATIONAL SAFETY AND HEALTH ACT including questions on standards, voluntary compliance information, and publications.

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