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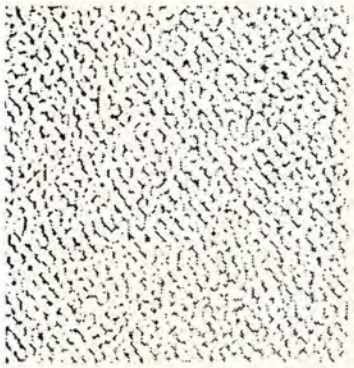

HOSPITAL OCCUPATIONAL HEALTH SERVICES STUDY

VII SUMMARY and CONCLUSIONS

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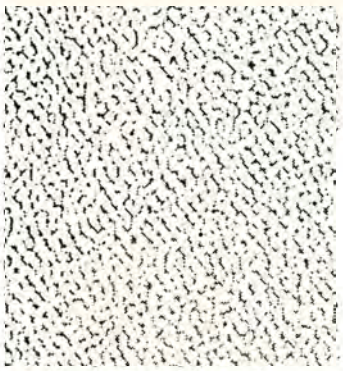

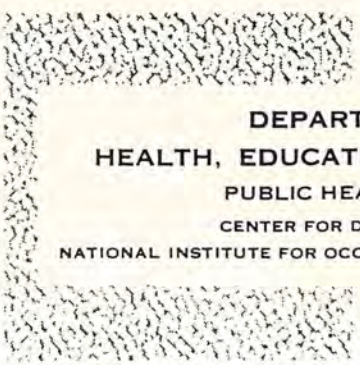

DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

Hospital Occupational Health Services Study

VII. Summary and Conclusions

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service

Center For Disease Control

National Institute for Occupational Safety and Health

Division of Technical Services

Cincinnati, Ohio 45202

April 1976

For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

HEW Publication No. (NIOSH) 76-115

This publication presents the seventh of a series of reports of a national survey of hospitals. This study was performed under NIOSH Contract HSM–099–71–050 by Computer Sciences Corporation, further analyzed and edited by Applied Health Physics, Inc. The purpose of this study is to provide NIOSH with resource information on existing employee health services in hospitals and to develop an acceptable action program to protect and promote the health of hospital employees in the United States.

The following publications in this series are available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402: Hospital Occupational Health Services Study.

1. Environmental Health and Safety Control. HEW Publication No. (NIOSH) 75—101. Price Per Copy $1.75. Stock No. 1733-00033.
2. Employee Health & Safety Statistics & Records, HEW Publication No. (NIOSH) 75-154. Price Per Copy $1.30. Stock No. 1733-00068.

3&4. Organization & Administration of Hospital Employee Health Services. Staffing of Hospital Occupational Health Unit. HEW Publication No. (NIOSH) 76-104. Price Per Copy $1.40. Stock No. 1733-00101.

5. Occupational Health Services for Hospital Employees. HEW Publication No. (NIOSH) 76-115. Price Per Copy $1.00. Stock No. 1733-00102.
6. Special Information. HEW Publication No. (NIOSH) 76-116. Price Per Copy $1.00. Stock No. 1733-00103.

FOREWORD

As the nation's hospitals respond to the growing needs of all phases of health care delivery, these institutions have grown rapidly in size, number and complexity. Hospitals are now the third largest employer in the United States, with approximately three million employees working full and part time.

Occupational health and safety services should become an integral part of health services and should be available to all groups of workers, including hospital employees. Yet, data from reliable sources during the past 10 years indicate that the accident frequency rate for hospitals has increased alarmingly.

Clearly, positive action is called for. As a consequence, the National Institute for Occupational Safety and Health conceived and implemented The Hospital Occupational Health Services Study — the first such major study ever conducted.

The initial step was to develop practical criteria for effective occupational health and safety programs for hospital personnel. The next step was to determine, through a comprehensive survey of American Hospital Association members, the extent to which these criteria could be or were being applied.

The final step will be the development of a workable action program to protect and promote the health of three million hospital employees, and indirectly, to safeguard millions of hospital patients serviced by these workers.

This series of seven reports on the study is disseminated by NIOSH — in the hope and belief that you, the reader, will find The Hospital Occupational Health Services Study not only enlightening but eminently usable.

CONTENTS

Hospital Occupational Health Services Study

VII. Summary and Conclusions

I. INTRODUCTION

This is the seventh and last in a series of reports on *The Hospital Occupational Health Services Study* which was conducted by the National Institute for Occupational Safety and Health (NIOSH). The first six reports describe various aspects of hospital occupational health services and are:

1. Environmental Health and Safety Control
2. Hospital Employee Health and Safety Statistics and Records
3. Organization and Administration of Employee Health Services
4. Staffing of the Hospital Occupational Health Unit
5. Occupational Health Services for Hospital Employees
6. Special Information

The above reports present all of the data from the study.

This seventh report includes a brief summary of the data analysis and findings from all of the six published reports and a brief presentation of summary descriptors. The summary descriptors demonstrate that only 8% of the 3,686 hospitals surveyed meet all of the NIOSH basic elements of an effective occupational safety and health program for hospital employees.

An annotated bibliography lists selected articles on occupational safety and health programs for hospital workers with information on the physical, chemical and biological health hazards in hospitals. Also listed are professional sources for additional consultation and assistance, periodicals and journals of professional associations with interest in occupational health and safety, and a glossary of terms accepted by the occupational safety and health professionals.

II. SUMMARY RESULTS

Environmental Health and Safety Control (Publication I)

Most hospitals provide some form of general occupational health and safety orientation for new employees. On further analysis, however, there was some difference by hospital size, with about 10% of the small hospitals, 7% of the medium, and 4% of the large having no orientation or failing to answer the question. Only slightly more than half of the hospitals have specific on-the-job training and orientation programs in occupational safety and health for persons with new work assignments.

About half of the hospitals reported having a formally organized program for employee safety and health education. Again, analyzed results showed that more of the large hospitals (70%), about half of the medium, and only one-third of the small had formally organized programs.

Routine in-service training programs on radiation exposure were *not* provided to employees in about 90% of the small hospitals, 75% of the medium and 60% of the large hospitals. While this topic shows the highest percent with no training, other topics are almost as high. For all hospitals, 55% have *no* training for chemical exposures, 50% have *no* training programs for infectious disease exposure, 60% have *no* training for safe use of equipment, 50% have *no* training for use of personal protective equipment, and 70% have *no* training for teaching proper lifting and body mechanics. As expected, small hospitals had higher percents and large hospitals lower.

Upon inquiry most hospitals indicated that their Safety Committee had been assigned the responsibility for managing their hospital's health and safety program. Except for the Safety Committee, the person(s) responsible for each of the health and safety functions were varied. Administrative assistants were mentioned second for having responsibility for the analysis of accident reports, and engineering-maintenance personnel were listed second for having the responsibility to conduct safety inspections.

Employee Health and Safety Statistics and Records (Publication II)

Almost all hospitals reported that they had an established system for recording and maintaining health information on their employees. Employee health records are kept in the Personnel Department by most small and medium size hospitals, while large hospitals maintain these records in the Employee Health Unit. About half of all hospitals have written policies and procedures governing access to, and release of, employee health information.

Practically all hospitals studied kept employee absenteeism records, but few recorded the specific reason for the absence such as illness or injury. The rate of unscheduled absenteeism for all hospitals averaged 3.2 days per employee with the rate increasing in large hospitals. When the reason was recorded, illness was the most frequent cause of absence listed by all hospitals. Family health problems ranked second; "other" problems, third; and injuries, fourth.

About 60% of the total reporting hospitals kept a record of the personal health history of employees, while less than 40% of the hospitals included an occupational history in the employee's health record. Reports of injuries were kept less often than illness reports. Less than half of all hospitals maintained a record of employee visits to the clinic, emergency room, or employee health nurse. Referrals were recorded by less than one-fifth of the hospitals. Workmen's Compensation records were included in the employee health records by almost three-fourths of all hospitals.

Respiratory problems ranked first as the most frequent occupational health problem, exclusive of injuries. "Other infections" ranked second and dermatitis ranked third. Strains and sprains were the most frequently reported types of occupational injuries listed by the total of all hospitals. However, large and medium hospitals ranked puncture wound as the leading

type of occupational injury, but this was reported fourth in small hospitals. Abrasions and contusions were ranked in third place by all hospitals.

The average number of reportable occupational injuries per hospital per year was about 70 while the number of occupational illnesses was six. Those injuries and illnesses involving lost time totaled 18 per hospital per year. As would be expected, these data increased as the size of the hospital increased.

Organization and Administration of Employee Health Services (Publication III)

Almost 70 percent of the hospitals reported that they had a formal program to provide occupational health care for their employees. Only 60 percent of the small hospitals, 75 percent of the medium, and 85 percent of the large hospitals provided such care through a formal program based on written guidelines or directives. The States ranged from 0-63 percent of the hospitals with such a program but eight States were noticeably below the others. It is of interest to mention that of the hospitals accredited by the Joint Commission on Accreditation of Hospitals (JCAH), 85 percent had a formal program for occupational health services.

In 80 percent of the hospitals, on-the-job injuries and illnesses of employees were treated in the emergency room. Only 10 percent of all hospitals reported using the employee health unit for such care, and these were predominately among the larger hospitals. Slightly less than 15 percent of all hospitals reported the existence of facilities exclusively for employee health care. Most hospitals with such facilities kept them open for employee use during normal business hours Monday through Friday. When closed, employees were treated elsewhere within the hospital, usually the Emergency Room.

Most hospitals (95%) reported that employees were required to see a physician or nurse before leaving the hospital because of an illness or injury. However, less than 60 percent of all hospitals required employees to see a physician or nurse upon return to work after an illness or injury.

Staffing of the Hospital Occupational Health Unit (Publication IV)

The emergency room staff provided the day-to-day health care services in nearly 50 percent of all hospitals, while the occupational health nurse, floor nurse, house physician, and outpatient staff also provided services. The emergency room staff (40%) and floor nurses (20%) most frequently provided services in small hospitals. In medium hospitals, the emergency room staff (60%) and occupational health nurses (15%) provided services and in large hospitals, the emergency room staff (30%) and occupational health nurses (40%) provided these services.

The responsibility for medical treatment of job-related problems is often shared. The physician on call had some responsibility in 40 percent of the hospitals, the emergency room physician in 35 percent, and the employee family physician in 65 percent.

When asked for information concerning the time a physician spent in providing medical treatment for hospital employees, almost half indicated no time or did not answer the questions. As would be expected, the large hospitals indicated physicians spent considerably more time providing these services to employees than was indicated by the medium or small hospitals.

Only 20 percent of all hospitals reported that a registered nurse had primary responsibility for providing health care to their hospital employees. Sixty-five percent of the large hospitals had an employee health nurse.

Over 90 percent of the small hospitals, three-quarters of the medium-sized and about one-third of the large hospitals do not have a nurse specifically assigned to perform services to hospital employees. Where those hospitals did have such a nurse, the nurse was administratively responsible to the Director of Nursing in one-third of the hospitals and to the Personnel Director in one-fourth. The employee health nurse, in about 55 percent of the hospitals, receives medical direction by written individual orders. Over 30% of the nurses function under written standing orders, and 15% of the nurses generally function under both types of medical directions.

Occupational Health Services for Hospital Employees (Publication V)

Care for injury was the most frequently mentioned service provided. Over 90 percent of all hospitals mentioned this, while over 75 percent mentioned physical examinations. Applicants for full-time employment were given physical examinations by more hospitals than were applicants for part-time employment. About 85 percent of the hospitals conducted physical examinations on the former group and 75 percent on the latter. Only about one-third of all hospitals required a physical examination for employees returning from illness or absence and almost no hospitals required terminating employees to have physical examinations. Very few hospitals (8%) did pre-placement examinations on employees transferring to different jobs within the hospitals.

The study also sought to determine if there were any periodic health examinations performed after the pre-employment physical. About 15 percent of the hospitals do not perform periodic examinations. Almost 65 percent of all hospitals indicated that they conduct periodic examinations on all employees while nearly 20 percent performed examinations on employees in selected job categories. Few hospitals (3%) performed physical examinations on employees in certain age groups.

The chest x-ray was the most frequently mentioned procedure in the employee physical examination, while a urinalysis and a serologic test for syphillis were second and third.

Routine immunization programs were reported by about 40 percent of all hospitals. Nearly 55 percent of these hospitals based their programs on written policies and procedures. Influenza immunizations were given in 97 percent of all hospitals while tetanus was the second most frequently administered.

Health counseling for employees was provided in only about 30 percent of the hospitals surveyed. The most frequent source for health counseling was the employee's immediate supervisor, except in large hospitals where the employee health nurse was responsible for counseling workers.

Special Information (Publication VI)

Occupational health services for contract and volunteer workers were analyzed in this publication. A little over half of the hospitals indicated that they had contract workers while about 70 percent reported that they had volunteer workers.

About 15 percent of the hospitals said that the immunization requirements were the same for contract workers as for hospital employees. In general, as the number of contract workers in the hospital increases the percent increases.

Immunization requirements for volunteers follow a somewhat different pattern. Similar immunization requirements for volunteer and hospital workers increased with the number of volunteers up to the 100-199 volunteer level, and decreased in those hospitals with 200 or more volunteers.

Almost 25 percent of all hospitals provided the same health services for contract workers as for hospital employees. The percentages for those with contract workers ranged from about 40 percent for hospitals with 1-9 contract workers to over 60 percent for hospitals with 200 or more contract workers. About 30 percent of the hospitals reported that volunteers received the same health services as did hospital employees, with little variation among the various numbers of volunteers.

About 15 percent of the hospitals reported that employee unions participated in the development of health and safety programs. However, there was far more participation by unions in the development of safety programs than in health programs.

The survey attempted to collect information on health and safety policies for the pregnant employees. Only about 10 percent of all hospitals reported that they had no formal policy with respect to pregnancy. However, less than 40 percent of the hospitals required early re-

porting of pregnancy, and less than 15 percent reassigned pregnant workers to safer working conditions. Very few hospitals provided pre- and post-natal counseling for working employees. Medical clearance to continue employment while pregnant was a requirement in almost two-thirds of the hospitals, and almost 90 percent granted maternity leave to women workers.

III. DESCRIPTORS

Descriptors were developed prior to the collection of the data to aid in describing the status of employee health programs in hospitals. We should note that these descriptors are a simplified look at the employee health programs of hospitals and do not encompass the elements of a "good" employee health program.

Several items were used to make up the 16 possible descriptors:

1. Formal program — Does the hospital have a formal program for the provision of occupational health care to employees?

2. Treatment at health unit — Is treatment for an injury or illness on the job usually obtained at the employee health unit?

3. Separate room — Does the hospital have a separate room or facility exclusively for the health care of employees?

4. Facility open 5 day/shifts — Is the facility open 5 day/shift combinations per week? (That is 5 out of the 21 possible day of week and shift combinations — 7 days times 3 shifts.)

5. Registered nurse — Is there a registered nurse with primary responsibility for the provision of employee health services in the hospital?

The 16 descriptors can be reduced to the most frequently mentioned by the hospitals queried:

Formal Program	Treatment at Health Unit and Separate Room	Separate Room and Facility open 5 day shifts	Registered Nurse		Number	Percent
No	No	No	No	(0000)	1540	29.1
No	*	*	*	(0.....)	118	2.2
Yes	No	No	No	(1000)	2546	48.1
Yes	No	No	Yes	(1001, 1002)	395	7.5
Yes	No	Yes	Yes	(1011, 1012)	193	3.6
Yes	Yes	Yes	Yes	(1111, 1112)	426	8.0
Yes	*	*	*	(1.....)	80	1.5

*Yes or no for each, but not combinations above

One can see several things from the above table: (1) If a hospital has no formal program it is unlikely to have treatment at a health unit (and therefore a separate room and facility open) or a registered nurse with primary responsibility for the provision of employee health services. (2) Almost 30 percent of the hospitals have no formal program. (3) Almost 50 percent of the hospitals have a formal program, but none of the other elements of the descriptor. (4) If there is a formal program and one other element, that other element is most likely the presence of a registered nurse.

The percent of the hospitals by descriptors and hospital size are as follows:

Formal Program	Treatment Separate Room	Separate Room, 5 day shifts	R.N.	Total	Small	Medium	Large
----	----	----	----	100.0	100.0	100.0	100.0
No	No	No	No	29.1	38.7	22.5	10.5
No	*	*	*	2.2	2.1	1.6	4.2
Yes	No	No	No	48.1	53.1	51.8	21.1
Yes	No	No	Yes	7.5	4.9	10.3	9.8
Yes	No	Yes	Yes	3.6	0.3	4.3	13.8
Yes	Yes	Yes	Yes	8.0	0.0	8.0	36.5
Yes	*	*	*	1.5	0.7	1.6	4.2

*Yes or no for each, but no combinations above

Three differences are apparent from this table: (1) Small hospitals are more likely to have no formal program (and none of the other elements) than medium hospitals and especially large hospitals. (2) Large hospitals are less likely to have no formal program or only a formal program than other hospital sizes. (3) Large hospitals are more likely to have all four elements than others.

Generally, the percent distributions by descriptors for geographic regions were the same as for the total. The New England and Middle Atlantic Regions did have differences, however. The New England region was much lower for the category "formal program only" (34%) but over twice as high for "yes, for each element" category (20%). The Middle Atlantic region was very low — under half that of the total — for "no formal program or other element" (13%), but higher for each of the three descriptors with both formal program and RN.

IV. ANNOTATED BIBLIOGRAPHY

A. HAZARDS

Health Hazards to Hospital Employees and Methods of Hazard Control, General

1. .....
Hospitals.
ILO Encyclopedia of Occupational Health and Safety, Geneva, 1971.

Hazards to medical and paramedical personnel in hospitals include infectious and parasitic diseases; contact dermatitis, especially allergic eczema due to pharmaceutical products and disinfectants; and diseases due to ionizing radiations. Hazards to laundry workers include infectious contaminations, burns, and eczema caused by washing products and disinfectants. Maintenance men are susceptible to injuries from hand machines, machine tools and grinders, and to eczema from solvent usage; kitchen workers are more likely to experience accidents while handling foods, cooking, or washing dishes. The article stresses the importance of preemployment and periodic examinations and immunization practices.

2. DOUGLASS, B.
Health problems of hospital employees.
JOM 13: 555-559, Dec. 71.

Back problems, skin reactions, toxic vapors (metallic mercury spills on laboratory floors), ionizing radiation and infections (smallpox, hepatitis, and tuberculosis) are listed as occupational hazards among hospital employees. The author recommends the need for new employees at risk to be warned of potential occupational hazards especially new employees with past or current back problems. Policies should also be instituted for the obese (50 lbs. overweight) applying for jobs in hospitals. The author suggests several approaches to weight control programs for new hospital employees.

3. THE HILL-BURTON PROGRAM: HOSPITAL & MEDICAL SERIES
Environmental aspects of the hospital.
US DHEW-PHS Pub. No. 930-C-15-16-17-18 Washington, D.C., 67.

Volume I deals with infection control in the hospital with special attention to departmental responsibilities in surveillance and methods of infection control. Volume II presents information and guidelines on supportive departments and their role in the daily implementation of environmental health principles in the hospital. Safety principles and practices in hospitals are the focus of Volume III, with emphasis on hazard and hazard controls for laboratory workers. Safety measures are also presented for employees working with radiation and flammable gases. Volume IV, designed for hospital administrators, presents basic principles and practices upon which hospital environmental control programs can be built.

4. LARSEN, L., SELIGMAN, E.
Many hospitals fall short in occupational health programs, sample surveys indicate.
Hospitals 43: 75-79 May 69.

The purpose of this article is to identify some of the occupational health hazards existing within hospitals based on a survey of occupational health facilities within 30 midwestern hospitals. Findings indicated that only 12 of the 30 hospitals had a coordinator of employee health and safety, and only 11 of the 30 hospitals surveyed had safety committees. Serious problems discussed in the article included dermatosis in hospital employees, improperly inspected x-ray equipment, and the need for infection control programs. Hospital hazards mentioned in the article include ozone emissions from photocopying machines, room sterilizers, toxic mercury used in the laboratory, welding, use of solvents and use of flammable gases for anesthetics.

5. LUNN, J. A.
Hospital hazards.
Practitioner 210: 490-493, Apr. 73.

The author summarizes the various health hazards to hospital employees in the United Kingdom and the target population of the hazard within the employee population. Hospital hazards described include: needle punctures, falls and back injuries, lack of personal safety equipment, hand injuries, assaults by patients, infections (such as throat, smallpox, TB, diphtheria, polio, serum hepatitis), radiation exposures, anesthetics, and job stress.

6. MAMMEN, H. W., LINDEN, N. J.
The need for employee health services.
Arch. Enviro. Health 9: 750-757, Dec. 64.

A list of hospital employee health hazards was compiled as a result of a one year study on employee hazards, accidents, illnesses and injuries at a large midwestern hospital. Potential health hazards in the working area included mercury solvents, dermatitis-producing materials and infections. Hazardous conditions included high noise levels produced by automatic film processing machines, automatic sterilizers, and standby deisels. Other hazardous conditions included employee exposure to therapeutic and diagnostic radiation treatments and excessive heat in the cafeteria kitchen area. Accidents causing sprains and strains were attributed to lifting patients, heavy instrument packs, housekeeping equipment and dietary supplies. Lacerations were attributed mainly to broken glass, and to improperly disposed needles and knife blades. Hot liquids, steam and steam pipes accounted for 77% of all burns.

7. PERSILY, T., LEHMANN, P.
The hospital: hazardous haven.

Job Safety and Health 2: 5-10, Feb. 74.

Heading the list of common injuries in hospitals are back strains, falls, and needle punctures. Exposure to infection, anesthesia; and radiation from x-ray machines and microwave ovens prove to be potentially dangerous to nursing and non-nursing personnel. Included in the article are measures that some hospital administrations have taken to control hospital hazards and promote employee health and safety.

8. WILKINSON, T.
Control of physical and chemical agents.

Hospitals 46: 95-102, Oct. 72.

The paper attempts to identify chemicals and various potentially harmful physical agents hazardous to hospital employees. Agents identified as potentially dangerous to hospital employees include: thermal stress, noise, vibration, and ionizing and nonionizing radiation (electroshock). Nonionizing radiations including microwaves can be especially hazardous to kitchen workers. Other agents listed as potentially harmful are flammable and toxic chemicals and anesthetic gases.

Physical Hazards and Methods of Control

9. ARBEIT, S. R., PARKER, B., RUBIN, I. L.
Controlling the electrocution hazard in the hospital.

JAMA 220: 1581-1584, June 72

Four steps required to reduce electrical shock hazards are: ground everything else, but do not ground the patient; ensure that the building's electrical supply and wiring conforms to all current standards; use safe equipment; set up a preventive maintenance program for all equipment wiring and outlets. According to the authors, the only acceptable standard in selection of electrical equipment is the Veterans Association Procurement Standard X1414. The authors cannot justify the use of isolated power systems outside the ICU or the OR because of microshock. Other contraindications for use of the system are the increased complexity of the system; decreased reliability and increased maintenance problems; poor distribution problems; interference with EKG and EEG recordings; and the expense of the system. There is a need for knowledgeable safety committees in every small hospital and for a biomedical engineer in large hospitals to cope with electrical safety problems and hazards.

10. BOEKER, E.
Radiation safety.

AJN 65: 111-116, Apr. 65.

Nurses may be exposed to radiation in a number of different situations: caring for patients being treated with radium; assisting with the administration of artificially produced radioisotopes; caring for patients being treated with radioisotopes. The effects of receiving repeated small doses of radiation over a long period of time are not well known. Evidence appears to indicate that there is no threshold dose under which radiation is proven not to be hazardous. Time, distance, and shielding are three important factors to remember in protecting oneself from external radiation. In evaluating the possible hazards from a given radioisotope and planning for its safe use, the following factors must be considered: form, half-life, amount to be administered, kind of radioisotope, behavior and method of administration. Clinical nurses should use long-handled forceps for handling radioisotopes emitting penetrating gamma radiation. Unconfined radioactive material should not be handled by anyone with cuts or breaks in the skin.

11. BUSHONG, S. C., PRASAD, N., BRINEY, S.

Interlocks for general purpose radiographic rooms.

Health Physics 23: 392-394, Sep. 72.

The authors urge the installation of interlocks on all doors leading from examining radiological rooms to hallways, other examining rooms and waiting rooms. The National Council for Radiation Protection recommends their use for radiological therapy rooms operated at 150kV or above. The authors emphasize the use of interlocks in diagnostic radiology because of the frequency of exposure for physicians and technicians involved in diagnostic radiation. The cost of labor and materials for interlock installation rarely exceeds an additional $100.00.

12. ENVIRONMENTAL CONTROL ADMINISTRATION

Regulations, standards, and guides pertaining to medical and dental radiation protection; an annotated bibliography.

US DHEW-PHS No. 999-Rh 37: June 69.

This report contains annotated bibliographies pertaining to medical and dental radiation protection. Included in the report are references on general standards, guides and recommendations on safe operation, handling and design of radiation equipment, and sources and guides pertaining to radiation measurement.

13. THE HILL BURTON PROGRAM: HOSPITAL AND MEDICAL FACILITIES SERIES

Noise in hospitals.

US DHEW-PHS No. 930-D-11 Washington, D. C., 63.

The findings and recommendations of this study relate to major sources of noise common to most hospitals. The purpose of the study was to describe practical ways to control or to eliminate the causes of noisy situations. The report emphasizes the need for a program, not only for checking the mechanical and operational sources of noise, but also for thoroughly briefing personnel on work activities contributing to noise.

14. INGRAHAM, S., BARNETT, B., TAYLOR, W.

Radioisotope facilities in the general hospital.

The Modern Hospital 105: Nov. 65, PHS Pub No. 930-D-22.

This publication presents guidelines for planning and operating two radioisotope facilities: one for hospitals anticipating relatively simple diagnostic tests and the other for hospitals anticipating diagnostic tests, diagnostic scanning procedures, and occasional intracavity therapy. Emphasis is placed on radiation protection for clients and employees and on design of the radiation facility.

15. NATIONAL COUNCIL FOR RADIATION PROTECTION

Basic radiation protection criteria.

NCRP No. 39: Washington, D.C., Jan. 71.

The basic radiation protection criteria presented in this report are intended for the two following areas of application: to provide an up-to-date framework for more detailed recommendations that deal with specific aspects of protection; to provide guidance in radiation protection to concerned legislative bodies, governmental agencies, all medical practitioners and technicians, all branches of nuclear industry, laboratories, university staff and students, and the public. The report deals with internal and external sources of ionizing radiation and pertains to occupational radiation protection and protection for the general public.

16. NOWAK, P. A.

Inservice education in radiation health.

NCNA 2: 107-113, Mar. 67.

Three objectives for an inservice education program dealing with radiation hazards and protection are: define the radiation problem associated with its use; explain the need for radiation therapy; help personnel maintain adequate safety when dealing with radiation. This paper presents, in some detail, an outline of an inservice education program for hospital employees working with radioactive materials.

17. POWELL, M.

Building noise in a hospital.

Annals of Occ Hyg 16: 77-79, Apr. 73.

A small study on noise levels in a general hospital indicated that noise levels as low as 64 dB upset patients but did not upset staff. With increased noise, the workloads of the nurses increased.

18. SAGAL, E. R.

Microwave radiation injury.

Trial: 59-62, Mar./Apr. 72.

Microwave radiation is a form of electromagnetic energy which is intermediate in frequency and wave length between the radio beams and infrared beams. Microwave energy is transmitted by air and glass, reflected by metals, and absorbed by human tissue and foods. Microwave energy is easily absorbed and generates heat quickly in the absorbing material. Injury to body tissue is primarily from that of thermal response which occurs when radiant energy is absorbed and converted to heat within the tissue. Tissues which cannot disseminate heat rapidly (eyes, skin, and testes), and which are near the surface of the body, are most susceptible to injury. In some heart patients, possible interference with transvenous-implanted, ventricular-sensing pacemakers does occur when they are in close proximity to microwaves. The Bureau of Radiological Health states that any microwave oven manufactured after Oct. 6, 1971, shall not have a leakage of radiation above the limit of 1 mw/sq. cm., at any point, any distance 2 or more inches away from the oven surface prior to transfer to a purchaser. A limit of 5 mw/sq. cm. is applicable after acquisition by purchaser.

19. TURNER, A. G., KING, C. H., CRADDOCK, J. G.

Measuring and reducing noise.

Hospitals 49: 85-90, August 75.

A noise profile of a hospital shows that even "quiet" areas are too noisy. Noise level measurements were taken at 34 patient care locations in a hospital to prepare the hospitals' noise profile. The noise levels were found to be above speech and sleep interference levels. The author lists many practical approaches to reducing hospital noise including the development of staff awareness of the problem.

20. U.S. DEPARTMENT OF COMMERCE, National Bureau of Standards

Safe handling of bodies containing radioactive material.

National Bureau of Standards, *Handbook* 65: Washington, D.C., July 58.

This handbook provides pertinent information for the guidance of mortuary and medical personnel in the handling and autopsy of bodies containing radioactive material.

21. US, DHEW, PHS, FDA

Radiation safety and protection in industrial applications (Proceedings of a symposium held on Aug. 15-18, 1972 Washington, D.C.)

US DHEW Pub No. (FDA) 73-9012: Oct. 72.

Portions of this symposium pertain to hospital radiation safety, especially the principles in radiation protection, and methods for monitoring radiation equipment and personnel.

Chemical Hazards and Methods of Control

22. ----------

Precautions for laboratory workers who handle carcinogenic aromatic amines. Chester Beatty Research Inst., Institute of Cancer Research, London, England, May 66.

This paper contains a recommended code of practice for laboratory workers in the hospitals and other laboratory settings. The article lists substances which potentially may cause tumors of the urinary tract, and indicates modes of exposure. Recommendations as to specific preventive and protective measures are included in the code.

23. COHEN, E. N., et al.

Occupational diseases among operating room personnel: a national study

Anesthesiology 41: 321-340, Oct. 74.

A national study of occupational disease among operating room personnel was conducted by mailing questionnaires to 49,585 exposed operating room personnel in four professional societies and to 23,911 unexposed individuals in two professional societies serving as a comparison group. The results indicate that female members in the operating room-exposed group were subject to increased risks of spontaneous abortion, congenital abnormalities in their children, cancer, and hapatic and renal disease. This increased risk of congenital abnormalities was also present among the unexposed wives of male operating room personnel. No increase in cancer was found among males, but an increased incidence of hepatic disease, similar to that in the female, was found. Although the present study does not establish a cause-effect relationship between the increases in these diseases and exposure to the waste anesthetic gases in the operating room, considerable evidence in the experimental

animal suggests such a relationship. It is, therefore, reasonable to assume that this relationship may also apply to the clinical situation. In consideration of the potential health hazards involved, a strong recommendation is made for the venting of waste anesthetic gases in all anesthetizing locations.

24. KERNAGHAN, S.

Caution: anesthesia may be hazardous to your health.

Hospitals 46: 143-147, Feb. 72.

The author presents a discussion of the possible hazardous effects of anesthesia contaminants in the operating room, including possible abortion in pregnant nurses and female physicians, and possible sleepiness due to inhalation of the anesthetic. Also included in the article is a description of current research in the area of anesthetics as it affects operating room personnel. The author recommends that effective scavenging systems be installed in every operating room to eliminate all anesthetic gas contaminants. The cost per unit is $80-$100.

25. ROSSER, R.

Canadian hospital bans flammable anesthetics for safety's sake.

Hospitals 43: 117, July 69.

Author presents the policy formation of one hospital to prohibit flammable anesthetics from use in the operating room. With this new policy, OR humidity could be reduced and less emphasis placed on the prevention of static electricity and use of electrically conductive equipment and footwear.

26. SAMITZ, M. H.

The industrial dermatoses.

AJN 65: 79-82, Jan. 65.

Dermatoses are the highest ranking cause of lost time in industry and account for most reported cases of occupational disease. Causative agents of industrial dermatoses include mechanical agents (friction, pressure, trauma, vibration); physical agents (heat, cold, humidity, sunlight, ionizing radiations, electricity); biological agents (bacteria, fungi, viruses, parasites); and chemical agents (acids, alkalies, solvents, essential oils, dyes, petroleum products, greases). Employees most susceptible to dermatoses are those with poor personal hygiene, dry skin, abundant body hair, and careless work habits in handling chemical agents. Chemical agents cause 80% of all occupational dermatoses.

27. WHITCHER, C., et al.

Development and evaluation of methods for the elimination of waste anesthetic gases and vapors in hospitals.

US DHEW, PHS, CDC, NIOSH, Cinti., Ohio 45202, HEW Pub. (NIOSH) 75-137.

A health hazard affecting operating room personnel is probably related to chronic exposure to trace concentrations of the inhalation anesthetics. The sources of such agents are discussed, as well as their distribution in the operating room. Effective control requires a systematic approach that includes: collection of gases and vapors at the anesthetic breathing systems; "low-leakage" practices by the anesthetist; equipment maintenance; and an air monitoring program. Careful application of these measures will yield less than 30 ppm nitrous oxide and less than 0.5 ppm halothane in the operating room air.

28. WHITCHER, C. E., COHEN, E. N., TRUDELL, J. R.

Chronic exposure to anesthetic gases in the operating room.

Anesthesiology 35: 348-353, Oct. 71.

Results of a study of halothane concentration in two operating rooms during a course of general surgery are presented. Investigation confirms earlier studies indicating a residual concentration of anesthetic gases in the OR during the course of anesthetics. Sixteen hours after exposure, operating room personnel exhaled measurable halothane concentrations in their end tidal samples. Past studies have indicated: an increase in hepatic damage with repeated halothane exposure; functional disturbances of the CNS following prolonged halothane exposure in poorly ventilated rooms; increased spontaneous abortion rate in female physicians and nurses. Present studies indicate that ambient halothane air content in the operating room should be below a concentration of 1 ppm. The authors suggest that OR's be air conditioned with nonrecirculating systems capable of providing a minimal total air exchange rate of at least 10x an hour.

29. .....

Infection control in the hospital.

AHA, 340 Lakeshore Drive, Chicago, Ill., 68.

This book pertains mainly to the control and surveillance of hospital acquired infections. Chapter 3 "General Organization of Responsibility" presents information in infection control as it relates to the employee and his health. Recommended models as to preemployment physicals, immunizations, employee health services and inservice education programs are included. Guidelines are listed for establishment of an infection control committee; also listed are the job descriptions for infection control nurses.

30. HALDANE, E. V., M.B., et al.

A search for transmissible birth defects of virologic origin in members of the nursing profession.

Am. J. Obst. & Gynec. 105:1032-1040, Dec. 69.

Study conducted at Dalhouse University Hospital, Halifax, NS, indicated that nurses who gave hospital or home care to children with congenital defects had a 25% incidence of congenital abnormalities in their offspring, whereas nurses not giving such care had a 9% incidence of congenital abnormalities in their offspring. Findings indicated that children with congenital diseases such as rubella excrete viruses in their saliva, urine and stool for as long as six months after birth. The researchers advise that nurses who work while pregnant should limit themselves from performing such duties entailing contact with infective patients.

31. .....

Smallpox vaccination of hospital personnel still urged.

Hospitals 45: 59, Dec. 71.

Hospitals are still known to be the chief site of smallpox transmission within nonendemic countries. The U.S. Public Health Service still recommends smallpox immunization for persons in health occupations involving direct contact with patients. A hospital can be considerably well protected if at least 80% of all hospital personnel have been vaccinated within a three year period.

32. .....

Recommendations-PHS advisory committee on immunization practices.

Morbidity and Mortality Weekly Report 21, No. 25: US DHEW, CDC, Pub No. 72-8154, June 72.

Recommendations for the following immunization practices are included in the text: cholera vaccine, diphtheria and tetanus toxoids and pertussis vaccine, immune serum globulin for protection against viral hepatitis, influenza vaccine, measles vaccine, mumps vaccine, plague vaccine, poliomyelitis vaccine, rabies prophylactic vaccine, Rh immune globulin, Rocky Mountain spotted fever vaccine, rubella vaccine, smallpox vaccine, typhoid vaccine, typhus vaccine and yellow fever vaccine.

33. BARRETT-CONNOR, E.

The control and prevention of hospital acquired infection.

Prev Med 1: 195-208, 72.

The basic functions of the infection control committee are surveillance, isolation procedures, environmental control, and recommendations. The infection control officer is responsible for appointing a hospital infection committee which should represent a cross section of staff specialities. In addition, a special person needs to be designated to perform the actual collection of data, usually a nurse epidemiologist. Ward and laboratory surveillance is preferred over data collected from the record room. The most common types of hospital acquired infections are wound and urinary tract infections.

34. BENENSON, A. S.

Control of communicable diseases in man.

APHA: 1015 Eighteenth St. N.W., Washington, D.C., 1970.

This handbook, prepared by the APHA, includes the following information on 117 diseases: identification, occurrence, infectious agent, reservoir, mode of transmission, incubation period, period of communicability, susceptibility, resistance, and methods of control.

35. BRYAN, J. A., CARR, H. E., GREGG, M. B.

An outbreak of nonparenterally transmitted hepatitis B.

JAMA 223: 279-283, Jan. 73.

Growing evidence indicates that classic serum hepatitis or hepatitis B may be transmitted by routes other than parenteral. A study on the outbreak of 12 cases of employee hepatitis over an eight month period in a pediatric hospital revealed that greater risk of acquiring hepatitis was limited to those having close, continued, direct contact with patients receiving frequent long-term blood transfusions and having hemorrhagic diathesis. Transmission of the hepatitis could have occurred orally or parenterally, but is more likely to have been transmitted by the former mode.

36. CHALMERS, MRS. GEORGE

An innovative surveillance and infection control program.

Hospital Progress 53: 78-79, Aug. 72.

The current infection control program at one hospital is described. The infection control committee is composed of representatives from the medical staff, housekeeping, nursing service, the laboratory, central service, medical records, and the laundry. The hospital's most recent innovation is that of an environmental control nurse, extensively trained at CDC, who is responsible for updating isolation procedures and infection surveillance and control. She is assisted by a technician trained in bacteriology.

37. COMMITTEE ON THERAPY

Personnel tuberculosis control program in medical institutions.

American Rev Res Dis 104: 463-465, Sept. 71.

A tuberculosis control program at one hospital is presented in the paper. Methods of tuberculin testing, management of tuberculin reactors, nonreactors and converters, and methods of protecting personnel from tuberculosis infection, are described.

38. DEVENYI, P., JOURDAIN, P.

Viral hepatitis in health care personnel working with drug abusers.

JOM 15: 779-781, Oct. 73.

The occupational hazard of contracting viral hepatitis is particularly prevalent on the pediatric unit, the laboratory, and the hemodialysis unit. Results of a preliminary study of health care personnel working in a hospital where incidence of hepatitis is increased, indicated a low mortality among staff, the absence of Australia antigen carrier state, and no increase in transaminase values, as compared to a control group of non-health care workers within the hospital. The author stressed the staff's "hepatitis awareness" as an important self protective measure. The results of the study indicated that regular monitoring of asymptomatic staff for transaminase and Australia antigens was unnecessary.

39. GERIBALDI, R., FORREST, J., BRYAN, J., HANSON, B., DISMUKES, W.

Hemodialysis-associated hepatitis.

JAMA 225: 384-389, July 73.

The results of the CDC four year study, conducted through the National Cooperative Study of Dialysis Associated Hepatitis, includes endemic hepatitis rates for patients and staff in 65 units and descriptions of the clinical, laboratory and endemiologic features of cases reported to CDC. Practical steps to prevent or minimize continuous spread of hepatitis in renal hemodialysis units are outlined. Surveillance data suggested that blood transfusion was the main mode of transmission for hepatitis in hemodialysis units. Data indicated that other modes of transmission, both parenteral and non-parenteral, also exist.

40. HARRINGTON, J. M.

Medical laboratory safety.

Occupational Health 25: 411-416, Nov. 73.

Bacteria which are a potential danger to a hospital laboratory staff in Great Britain, include tubercle bacilli, salmonella, and shigella. Serum hepatitis, a viral infection, has been recorded in a number of renal dialysis units and in clinical laboratories handling blood from kidney hemodialysis patients. Measures to reduce the chance of laboratory-acquired infection are strict control and isolation procedures and the use of alternatives to mouth pipetting.

41. HAYASHI, S. J., NAKAMURA, R. M., GIORGI, E. A.

Problems of prevention and detection of hepatitis in personnel of hospital hemodialysis units.

JOM 13: 388-391, Aug. 71.

Five studies in California have shown an increased incidence of hepatitis in chronic renal disease patients which increases the hepatitis risk to personnel. The test for serum enzymes and Australia antigen was found to be the most sensitive technique to monitor patients and personnel for hepatitis. Prophylactic gamma globulin is still of questionable value in the treatment of

serum hepatitis. In transfusions to patients under renal dialysis, donor blood should be carefully screened for the Australia antigen and extensively washed to decrease transmissible agents of hepatitis. Hygiene practices for personnel should include: disposable patient utensils, no smoking or drinking in the unit, limits on visitors, disposable equipment, and use of isolation techniques for disposing of contaminated waste linens.

42. LITSKY, W.

Solid waste: A hospital dilemma.

AJN 72: 1841-1847, Oct. 72.

The author recommends the pneumatic chute method as the best method in the hospital for transport of solid waste. He also advocates an air system that is flexibly designed so that air can be filtered continually to decrease infection. Other recommendations relate to the sterilization of all pathological, surgical, and laboratory waste products prior to compaction, incineration, or sewage disposal.

43. OGASAWARA, F., ATKINSON, M. L.

For the general hospital — new guidelines on TB infection control.

Am Lung Dis Bulletin: 11-14, Sep. 74.

Authors describe the guidelines on TB control entitled "Guidelines on Prevention of Transmission of Tuberculosis in Hospitals." The article focuses on new recommended precautions for patients with identified or suspected TB, and employee tuberculosis control programs.

44. SELL, J. C.

Mechanical needs in the operating room and delivery suites.

Hospitals 48: 79-150, Nov. 74.

The author discusses aseptic practices and procedures to reduce bacterial contamination in the operating and delivery suites. The concept of laminar airflow is discussed at length: thermal requirements for comfort and safety, need for clean and filtered air, non-contaminated air supply, and air sampling, all to reduce the incidence of infections from people.

45. STILLERMAN, H. B., STILLERMAN, M., BARKER, W. D.

A practical method of hospital surveillance.

Hospitals 48: 91-93, Aug. 74.

One hospital's approach to infection control and surveillance is described here. The department of environmental health, composed of a medical director and a nurse epidemiologist, uses five methods for surveillance and control of nosocomial infections: determination of prevalence rates of nosocomial infections, antibiotic surveillance, reporting of the pattern of hospital infection, epidemiological review, and environmental surveys. Authors emphasize that each hospital must design methods of hospital surveillance appropriate to the hospital's needs.

46. TOP, F. H.

Control of infectious diseases in general hospitals.

APHA: 1740 Broadway, NY, NY 1967

This guide cites both the basic principles and specific measures for the prevention of the spread of infections within the hospital. The Joint Commission on Accreditation of Hospitals recommendations for composition and function of the hospital infection control committee are included. Specific guidelines for personnel protective techniques and environmental infection control measures are mentioned including techniques for handling wastes and clean linen and for disinfecting equipment and the hospital environment.

47. WALKER, B.

Environmental health in medical facilities.

Ohio's Health 22: 20-26, Apr. 70.

This article provides helpful suggestions for maintaining proper ventilation and disinfection practices in hospitals. Emphasis is placed on training for nurses and allied health workers in areas of disease transmission and control. The role of the hospital environmentalist is emphasized.

B. EMPLOYEE HEALTH SERVICES

General

48. AMA COUNCIL ON OCCUPATIONAL HEALTH

Scope, objectives, and function of occupational health programs. (Policy Statement)

JAMA 174: 533-536, Oct. 60, AMA Pub. OCCH 213.

This policy statement on the scope, objectives, and functions of an occupational health program includes guidelines on the activities of the program, organization and staffing needs, and location and needs of the facility.

49. AMA COUNCIL ON OCCUPATIONAL HEALTH

Company medical policies for occupational health programs.

AMA Pub OCCH 274, Revised 1973.

This article points out to management the advantages of an occupational health program, including reduced absenteeism and workmen's compensation and decreased insurance claims and labor turnover. Scope of an OHP is presented with a discussion of program objectives, staffing and facility needs, and program activities. Emphasis is placed on the importance of management interest in an OHP to increase its effectiveness.

50. AMA/AHA COUNCIL ON OCCUPATIONAL HEALTH

Guiding principles for an occupational health program in a hospital employee group.

JAMA Feb. 58; *Hospitals:* Feb. 58; (Additions and Policy Statement Jan. 68). AMA Pub No. 189

The handbook contains guidelines for the purpose, scope of service, and personnel needs of an occupational health service for hospital employees. Scope of service includes medical examinations, record-keeping, health education and counseling, and treatment for occupational disability. A guide for industrial immunization practices is also included in the publication.

51. AMA COUNCIL ON OCCUPATIONAL HEALTH

Guide to health education and counseling.

OHN 19: 17-19, Aug. 71. AMA Pub No. 312

One of the basic objectives cited in the AMA scope and objectives for occupational health programs is the encouragement of personal health maintenance by hospital employees. The inplant health education team include the physician, nurse, safety engineer, top management, the employee, union representatives, and supervisory personnel. Health and safety education materials can be obtained from the National Safety Council, American Diabetes Assoc., American Heart Assoc., American Red Cross, AMA, AA, AAIN, NFPA, and others.

52. AMA, DEPT. OF OCCUPATIONAL HEALTH

Employability of workers handicapped by certain diseases.

Arch Envir. Health, Sept. 1968, AMA Pub No. 293

Symposium emphasizes the principle of evaluating the ability rather than the disability of the potential employee. Successful employment of the handicapped involves the following AMA guidelines: proper medical evaluation of the applicant's physical and intellectual capacity for work; proper job placement in which the employee can utilize his maximum functions and skills without adversely affecting his own health or exposing his fellow workers to increased hazards; periodic reevaluation of the employee's health status to protect his capabilities for continuing satisfactory employment.

53. BLUESTONE, N.

Employee health services: one hospital's experience.

JOM 17: 230-233, Apr. 75.

A physician discusses the problems facing a large, well staffed, employee health service in a hospital isolated geographically from community acute care hospitals and the changes implemented to resolve many problems. The employee health services should be aimed at keeping people healthy (and at work), not caring for them when they are sick. Referral policies, counseling about health insurance plans, assisting with outside appointments and a strong employee education program have helped to get the sick and injured employee into the community health care delivery system.

54. COHEN, S.

Another look at the inplant occupational health program.

JOM 15: 869-873, Nov. 73.

The purpose of this article is to describe the trends in providing employee health services for workers, based on current needs of workers and basic guidelines and expectations for an occupational health program. The author reviews the past literature written on occupational health programs, emphasizing the Felton report and the AMA guidelines for scope and functions of an occupational health program. Reference is made to the importance of preplacement and periodic physical examinations, health education, and an active safety program for industrial workers.

55. CONANT, R. G., STENT, P. A.

The large general hospital, an industrial medical complex.

JOM 12: 364-366, Sept. 70.

The authors describe how one hospital recognized its need for an occupational health program and designed methods of selecting staff and integrating the unit into the hospital system. Included in the article are steps used to implement the personnel health service.

56. DIDDLE, A. W.

Gravid women at work.

JOM 12: 10-15, Jan. 70.

Physiological changes occurring during pregnancy that might affect the women's work include: weight gain, increased dependent edema, postural changes, and irritability of the nervous system. The type of work situations to be avoided during pregnancy include: heavy manual labor, prolonged standing, continuous immobilization, work requiring balance and possibility of severe injury, and exposure to toxic substances. Possible complications of pregnancy that might interfere with employee's efficiency, include hyperemesis gravidarum, urinary frequency, symptoms of pressure, vaginal discharge and fetal activity. Most companies recommend that expectant mothers leave work six weeks ante partum to prepare for delivery and not return to work until six weeks postpartum. Figures from the U.S. Bureau of Vital Statistics indicated a lower incidence of premature deliveries among the educated and employed as opposed to the uneducated and unemployed.

57. HOWE, H. F.

Organization and operation of an occupational health program.

JOM 17: Part I 360-400, (June) 75; Part II 433-440, (July) 75; Part III 528-540, (Aug) 75. Published in one volume, Sept. 1975, *AOMA*

This is a special article appearing in three volumes of the *JOM*. It is a very comprehensive approach to developing an occupational health program and provides extensive information on every aspect of occupational health services; including references, resources, and sources for additional information.

58. HUGHES, J. (Ed.)

Cost effectiveness of occupational health programs.

JOM 16: 153-186, Mar. 74.

This special issue deals with the cost effectiveness of occupational health programs. Most of the articles arose out of proceedings of a NIOSH sponsored conference at Fontana, California. The Fontana conference was called to provide a critique of an approach to cost benefit analysis that has been developed in the Kaiser Foundation International under a NIOSH contract. The Kaiser approach, defined in a generic model of an occupational health program, utilized the inplant program of the Fontana works of Kaiser Steel Corporation in Southern California as the test site.

59. McCARL, G. W.

The work place as a health care focus.

JOM 13: 570-2, Dec. 71.

The author presents clear and reasonable support for including a comprehensive health care center for personnel in the employees' work environment.

60. SPENCER, G. E.

Health needs of an industrial population.

JOM 14: 363-7, May 72.

This article about small industries contains concepts and information applicable to personnel health programs in hospitals. Specific worker needs discussed in the article include those of the pregnant female, the female with children and the needs of the ghetto employee. Suggestions are made as to the specific programs that industries could implement to meet the health needs of these employees. Preventive measures are stressed.

61. WISCONSIN STATE BOARD OF HEALTH

A general guide for an occupational health program for hospital employees.

Occupational Health Division, Wisconsin State Board of Health, P.O. Box 309, Madison, Wisc., 2nd Ed., 1967.

This booklet provides an indepth guide to the development and maintenance of an occupational safety and health program for hospital employees. Specific recommendations are included as to the scope and functions of the unit. Stress is placed on an autonomous employees health service with permanent staff responsible to administration.

Mental Health Service

62. CASSEM, N. H.

Sources of tension for the CCU nurse.

A.J.N. 72: 1426-1430, Aug. 72.

The author reports on a study conducted to determine sources of tension and stress for the CCU nurse. Three major identified areas of stress included: nursing administration, scheduling and staffing, and families of patients. Measures suggested by the researchers to decrease conflict included: regular meetings with the CCU director, separate area for coffee breaks and informal gatherings, adequate supervision, and meeting nurses' needs for independence and increased responsibility.

63. FELTON, J. S., SWINGER, H.

Mental health outreach of an occupational health service in a government setting.

AJPH 63: 1058-1064, Dec. 73.

The author describes an ongoing project in mental health services provided for employees in a government setting. Special programs provided within the service include: weight reduction groups, counseling to individuals with situational or maturational crises, race relations counseling and guidance for supervisors.

64. GARFIELD, F.

The drug problem and industry.

Industrial Medicine 39: 55-57, Aug. 70.

An industrial program for drug abuse should include the following basic provisions: education and orientation of occupational health physicians and nurses to assist in handling general psychiatric problems; consultation services to physicians and management for the evaluation and rehabilitation or referral of drug abusers; research into adverse affects on employees not abusing drugs; development of relationships with community agencies concerned with employee welfare; development of educational programs for employees which provide up-to-date factual information on the dangers of drug abuse.

65. AMA JOINT COMMITTEE ON MENTAL HEALTH IN INDUSTRY

The physician in small plant alcoholism programs.

Arch. Environ. Health 15: Sept. 67.

Included in this article are the guidelines for the development of a written policy for a small plant alcoholism program. Program responsibilities of the program coordinator, supervisors and physician are outlined. A list of organizations, films, and pamphlets and their sources are listed in the article for further information on alcoholism diagnosis and treatment.

66. LEEMAN, C. P.

A demonstration program on occupational mental health services.

Psychiatric Quarterly 47: 419-447, 1973.

The Job Improvement Service Project (Boston), which provided individual counseling to 373 employees at four different businesses and industrial sites for a period up to six months, is described in the article. The project was designed to gather information about the nature and frequency of job adjustment problems — especially among lower class workers. Counseling emphasis centered on the short term problem solving approach. Project results indicated that counseling orientation and successful outcome of counseling correlated highly with maintenance of employment. Post project questionnaires revealed that supervisors found the project helpful and that supervisors were beginning to recognize the effect of job adjustment problems and personal and family problems on absenteeism.

67. SOHN, D., SOHN, S., SCOTT, L.

Drug screening in industrial nursing.

OHN 18: 7-10, Aug. 70.

A history of jaundice, hepatitis, tetanus, bacterial endocarditis or malaria on the employee's past health record should indicate a possible drug user to the occupational health nurse. On interviewing the employee, the nurse should observe him for lethargy, nervousness, inappropriate responses and sclerosed anticubital veins. Urine screening is the best test to determine if an employee is taking drugs and to identify the drugs that he is taking.

Absenteeism

68. AMA COUNCIL ON OCCUPATIONAL HEALTH

The physician and sickness absence.

JAMA 199: 413-415, Feb. 67. AMA Pub No. 285

Examination of medical records will give the physician greatest understanding of the cause of work absenteeism. Explanation of absentee terminology and statistical measurements are included in the publication. Reasons for employee absence other

than long term disability, include difficulties due to shift change, respiratory ailments, alcoholism, problems of aging, and responsibilities of home and community life.

69. BEWS, D. C.

A medical program to assist management in the control of absenteeism.

JOM 8: 243-250, May 66.

Author defines absenteeism as a manifestation of breakdown in health in one or more of its components - physical, mental, or social. Incidental absences refer to these cases which do not extend beyond one calendar week in total and the disability absences are those lasting eight days or more. Bell Telephone of Canada's study of incidental absence in female employees indicated that; non-management employees had a 56% higher absence rate than management employees; absence rate for married women were 30% higher than single ones; the under 30 age group had the highest rate of absence; sickness absence was 40% higher on Monday than on any other work day; the larger the size of the group under one supervisor, the higher the absence rate.

70. KLIESCH, W. F., WHEELER, M.

A hospital health service evaluation of absentee control.

IMS 38: 46-49, Apr. 69.

This article summarizes absenteeism records at one hospital for a six-year period. Findings indicated that rapid changes in supervision increased absenteeism; quality supervision decreased absenteeism; inadequate staffing increased absenteeism; a clear concise absentee program decreased absenteeism.

71. KLIESH, W., WHEELER, M.

Absenteeism — a study in controls.

IMS 35: 190-194, Mar. 66.

Absentee control measures enforced at one hospital states that the employee must visit the health office after a sickness absence. Personnel who fail to report to the health office after illness are not paid sick leave benefits. At the end of each pay period, departmental time sheets are checked by the health office and all records of absences are posted to the employee's health record. The 1964 absentee study at this hospital revealed that frequent absentee offenders include people who recently became residents to the area; people experiencing difficulty with their work; employees who lived outside the community and commuted long distances to get to work.

Recordkeeping

72. AMA COUNCIL ON OCCUPATIONAL HEALTH

Guide to the development of an industrial medical records system.

Arch Environ. Health Part 1-2: 705, 1961, 11-4: 110, 1962. Revised 1972, AMA Pub No. 223

Industrial medical records should provide data for use in job placement, establishment of health standards, health maintenance in treatment and rehabilitation, workmen's compensation cases, epidemiological studies, and in assisting management with program evaluation and improvement. The occupational health nurse or physician has responsibility for maintenance of a simple health record for every employee showing results of pre-placement physicals and medical examinations, and visits to medical departments. This professional also has the responsibility for maintaining a record of absence caused by illness and injury. Specific forms described in the publication include physical examinations and statistical information forms.

73. BROGAN, MILDRED

What is worth doing is worth recording.

OHN 17: 9-14, Jan. 69.

At the Bell Telephone Company, each employee has a medical record on file in the medical department containing the following information: immunization records, records of disability, absences of more than seven calendar days, periodic health examinations, x-ray dates, as well as known allergies. The employees' medical file starts with an initial health interview, and a form which affords space for six audiograms on one side and six vision tests on the other. A clinical laboratory record is also included permitting fifteen urinalyses and fifteen hematology tests to be recorded. All visits to the medical department are recorded on the employee's treatment sheet.

74. VICKOREN, A.

Use, abuse and benefits of medical records.

OHN 16: 16-18, Dec. 68.

Industrial medical records should provide data for: use in job placement, establishment of health standards, health maintenance, rehabilitation, workmen's compensation, epidemiological studies, assisting management with program evaluation and improvement. Industrial medical records fall under four main categories including: examination forms, additional health forms, statistical information and miscellaneous. Miscellaneous records include clinical laboratory forms, EKG records, attending physician's report, referral for medical service, and immunization reports. The greatest abuse of medical records is probably the breach of confidentiality in the physician-patient relationship. Other abuses include delinquent completion of records, incomplete medical records, poor legibility and incorrect terminology.

75. ZACHARY, MABEL

Confidentiality of medical records: role of the nurse.

OHN 17: 18-20, Dec. 69.

This article is directed to the industrial nurse who is working without medical supervision from outside the company and has the responsibility for releasing medical information. No medical information should be released to physicians or health agencies outside the plant without written and signed authorization from the employee. The nurse's best protection is to seek to prevent problems in disclosing privileged information. She should seek to inform and convince management of the ultimate long term value of the confidential nurse-employee relationship and should establish a written policy regarding the confidentiality of medical records. Finally, the nurse must admit her professional and ethical limitations. If she cannot maintain a confidence with an employee, she should make the reason clear to him.

76. WISCONSIN STATE BOARD OF HEALTH, Occupational Health Division.

Basic record and report system for a hospital employee health service. Wisconsin State Board of Health Pub. No. 1000-11: Madison, Wisconsin 53702.

Booklet provides examples of individual employee health records that could be used in an employee health service. The individual employee health record should include a cumulative record of pre-employment and periodic physical examinations, tuberculin skin testing, chest x-rays, immunization practices, occupational injuries and illnesses, illness absence and visits to the employee health service. The employee health service is advised to maintain some type of daily report from which annual and monthly reports can be compiled.

Safety

77. .....

Safety guide for health care institutions. AHA/NSC: Chicago, Illinois, 1972.

This resource deals with hospital hazards and guidelines for safe working conditions for employees. Emphasis is placed on employee safety and hazard control with recommendations for employee inservice education and safety motivation programs. Special departmental hazards and specific safeguards for accident prevention are discussed in some detail.

78. BAKKO, O.

Employee safety program.

Hospitals 44: 52-57, June 70.

Author presents a report on the comprehensive employee safety program at Fairmont Hospital, San Leandro, California. The hospital safety committee meets once each month to review progress of the total safety program, to investigate specific problems or hazards, to make recommendations for improvement, to analyze the prior month's injuries, and to disseminate information. Safety inservice education focuses on actual problem situations that employees encounter in their own work area. As safety reminders, posters are developed to depict actual hazards that have caused injury within the hospital.

79. BRINGMAN, M.

Safety action sheet keys program.

Hospitals 48: 85-88, Jan. 74.

Author discusses the ongoing hospital use of a safety action sheet as a means of reporting immediately any employee injury to the Emergency Room, engineer and employees supervisor. This sheet alerts the employee's supervisor of the hazards within his departments. Notification of the hazard is followed by speedy correction of the unsafe condition.

80. BUSH, W. L.

Area councils key to hospital safety.

Hospitals 46: 78-80, Apr. 72.

The author describes the functions of the Southern California Hospital Safety Coun-

cil, which includes information exchanges about current hospital problems and programs, and training and disaster support for area members. NSC plans to include the establishment of area councils in all parts of the United States, with a national communication system to promote information exchange between all United States hospitals.

81. CONOLE, C. P.

Safety council innovates.

Hospitals 48: 88-90, Jan. 74.

Author describes the functions of the Safety Council at the State University Hospital, Upstate Medical Center, Syracuse, N.Y. The council is composed of twelve members, including representatives from electrical, disaster, infection, OR and radiation safety committees, to avoid duplication of services. Council's main functions include safety inspections of departments and recommendations for correction of hazard followed by a reinspection of the department.

82. DAVIES, R. L.

A review of accreditation requirements for hospital safety.

Hospital and Comm. Psych. 25: 341-342, May 73.

The author discusses the Joint Commission on Accreditation of Hospitals standards relating to hospital safety including Standards 1, 3, 5. Standard 2 deals with fire hazards. Every building must have an electrically supervised, manually operated fire system which automatically transmits an alarm to the fire department serving the hospital. Oxygen and flammable gases/liquids must be stored in separate areas either outside the building or in a room that is one hour fire resistant and vented to the outside when quantity increases 1500 cubic feet. Standard 1 states that the hospital shall be structurally constructed in a manner that protects the lives and ensures physical safety of its patients, personnel, and visitors. Standard 5 states that the hospital shall have a written plan for proper and timely care of casualties related to disasters.

83. LEACH, J. R.

Safety means saving.

Hospitals 46: 74-75, Sept. 72.

The strongest rationale for a safety program is that accidents are expensive. The first financial area that managers should consider when planning safety projects is the direct cost associated with accidental injuries. The safety program should cover employees, patients, visitors, and construction workers — anyone who comes in contact with the hospital. The employment of a full-time safety manager in many cases is a better investment than a committee of employees already involved in full-time jobs. The author believes that safety training should be an integral part of a broad supervisory training program instead of a separate distinct program.

84. SMARIGA, J.

Three steps help prevent hospital fatalities.

Modern Hospital 105: July 65, PHS Pub No. 930-D-21.

Three steps for planning fire safety in the hospital are covered in the article, including: minimizing the chance of fire; early discovery; restricting fire spread; extinguishing the fire; and evacuating the building. NFPA fire record bulletin charts are included, indicating the most frequent causes of hospital fires and their origins, number of injuries and illnesses attributed to hospital fires, and type of fire extinguishers to be used with different kinds of fires.

Training and Education

85. LAZENSKI, H., OPPENEER, J.

Hospitals offer employee health programs.

Hospitals 48: 66-68, Nov. 74.

The nurse educators co-sponsored with a County Heart Unit, a program to provide hospital employees with an opportunity to identify the risk factors in heart disease and their effects on individuals. The program increased the employees' understanding of risk factors and indicated a need for more inservice education programs that focus on improving health.

C. OCCUPATIONAL HEALTH PROFESSIONALS AND ALLIED HEALTH WORKERS

86. ANA, Special Committee of Nurses engaged in occupational health nursing.

Functions and qualifications for an occupational health nurse in a one-nurse unit.

ANA Publication Code No. 1, Kansas City, Mo., 1968.

The booklet provides a complete outline of the OHN's functions in industry, in-

cluding management and nursing care functions. The OHN collaborates with management for health education and health evaluation policies, programs for absenteeism and environmental health. Nursing care functions include: administering nursing care, coordinating nursing and medical responsibilities for health evaluation, providing health education and counseling, recordkeeping, developing policy and procedure manuals for the employee health service, working with the community as a referral source, and establishing methods of OHP evaluation. Qualifications for the OHN include a B.S.N. and experience in occupational health and general duty nursing.

87. BROWN, M. L.

The extended role of the nurse in occupational mental health programs.

IMS 40: 17-23, Dec. 71.

The author emphasizes the use of the crisis intervention model in the occupational health setting for psychiatric emergencies. The author sees this model as helpful when the nurse is counseling individuals with situational or maturational crises.

88. BROWN, M. L.

Trends for the future of occupational health nursing.

OHN: 7-11, Aug. 73.

The author discusses the expanding role of the industrial nurse effected by OSHA and the HMO concept. Three areas of occupational health nursing are dealt with: environmental control, epidemiology, and health education.

89. GARDINER, H. GLENN.

Utilization of corpsmen in the occupational health setting.

JOM: 13: 503-506, Nov. 71.

In one occupational health unit, medical corpsmen (medical technicians) are responsible to the staff nurse and perform the following functions: patient care, routine physical therapy, bandaging, dispensing of medications (except narcotics), taking blood samples, and taking routine x-rays and EKG's. The salary scale for the corpsman is somewhat lower than the RN salary.

90. HOWARD, D. R.

The physician's associate in occupational medicine.

JOM 13: 507-510, Nov. 71.

In the occupational health setting, the physician's associate can perform physical examinations, carry out and evaluate special diagnostic and therapeutic procedures (EKG, chest x-rays, pulmonary function tests), assist in the organization and management of preventive medical programs, and provide rehabilitative and administrative support. The legal status of the physician's associates is still uncertain although several states have passed legislation to sanction their use.

91. JONES, W. D.

Hospital engineering is technology management.

Hospitals 48: 99-100, 160, Sept. 74.

The author discusses increasing interest in improving the safety and reliability of medical facilities and equipment, as evidenced by new and stricter laws, regulations, and codes promulgated by government, professional and trade groups. Acceptance of this philosophy should move the hospital engineer out of the basement and up to "management row." The author lists the responsibilities and qualifications of the hospital engineer.

92. KELLER, M. (Ed)

Symposium on occupational health nursing.

NCNA 74: 95-132, 153-17, Mar. 72.

The symposium contains a number of articles of particular interest to the occupational health nurse. Included in the book is the theory "plant as the patient," and the use of Erickson's growth model to identify vocational and psychological needs of employees. Articles on alcohol prevention and control programs and the function of the nurse epidemiologist are also included.

93. KICKLIGHTER, L.

The nurse epidemiologist.

Hospitals 47: 48-56, Jan. 73.

The author sees the following as goals of the infection control committee: to identify susceptible individuals; to protect them before they acquire infection; to identify spreaders and vehicles of bacterial or viral diseases; to segregate them before they disseminate infection; to develop a knowledge of working conditions under which personnel care for patients. The author emphasizes the importance of surveillance and documentation to establish a baseline or endemic level for an institution and for

specific medical services and nursing units. The hospital infection committee reviews information collected by the hospital epidemiologist, makes recommendations for infection control, and reviews hospital procedures.

94. LINDELL, B.

Professional responsibilities of the health physicist in relation to the medical profession.

Health Physics 20: 475-483, May 71.

The article refers mainly to the need for the hospital physicist to design radiation equipment that is safer to patients and staff, to develop methods of dose calculation, and to devise instruments that measure staff doses obtained during radiotherapeutic and diagnostic procedures.

95. TRICHTER, S.

Environmental health activities at Metropolitan Hospital Medical Center.

J. Environ. Health 33: 93-96, July/Aug. 70.

The environmental health specialist has the following responsibilities at a large urban hospital: providing for maximum environmental health and safety; interpreting and applying rules and regulations pertaining to environmental health factors to agencies involved in hospital infection control; assisting the various departments in hospital infection control.

96. WEATHERBY, R.

Manpower needs.

Hospitals 46: 73-80, Oct. 72.

The need for a hospital environmentalist in the hospital is the focus of the article. Areas of concern for the environmentalist include general environmental health, infection surveillance and control, environmental and biomedical studies, occupational, environmental and radiological health, injury and accident prevention and community support. Guidelines for the education and training of the environmentalist are described in the article.

D. OSHA AND OTHER LEGISLATION AFFECTING HOSPITAL OCCUPATIONAL HEALTH PROGRAMS

97. .....

Occupational Safety and Health Standards: Code of Federal Regulations, Title 29, Part 1910.

Federal Register 39: No. 125, June 27, 74; OSHA, Washington, D.C.

Issue contains the revised occupational safety and health standards under Public Law 91-596, the Occupational Safety and Health Act.

98. .....

A handy reference guide.

The Williams-Steiger Occupational Safety and Health Act of 1970. US Dept. of Labor, GPO Washington, D.C., 1971.

The pamphlet gives a summary of the provisions of the Act, the enforcement of the Act and also organizations involved in implementing the Act. Listing of OSHA regional offices is included.

99. .....

Occupational Safety and Health Act of 1970.

Law and Explanation. Commerce Clearing House, Inc., Chicago, Ill., 1971.

The book covers two main areas; the first section deals with an explanation of OSHA and the second section presents the text of the law with committee reports and debates.

100. .....

Recordkeeping Requirements Under the Williams-Steiger Occupational Safety and Health Act of 1970, Revised 1975.

US Dept. of Labor, Bureau of Labor Statistics, Washington, D.C.

Forms necessary to maintain OSHA records are contained in this folder with instructions for completing forms. The centerfold, describing OSHA, must be posted in a noticeable place in all industries.

101. .....

What every employer needs to know about OSHA recording.

US Dept. of Labor, Bureau of Labor Statistics, Washington, D.C. 1973.

This booklet contains the most frequently asked questions regarding injury and illness recordkeeping and reporting requirements under OSHA.

102. .....

Analysis of workmen's compensation laws. 1974 Ed. (Issued Annually)

Chamber of Commerce of the U.S. 1615 H St., NW, Washington, D.C., 20006, Jan. 74.

The analysis of workmen's compensation laws attempts to provide ready reference to the statutory provisions found in the laws of the 50 states, D.C., Guam, Puerto Rico and Canadian province. Fourteen charts are included in the booklet under the following categories: coverage of the law, benefits provided by workmen's compensation laws, and administration of the laws.

103. .....

The most frequently cited OSHA violations.

American Laundry Digest: July 72.

Article consists of a one page list of the most common OSHA violations found in hospital settings by OSHA inspectors.

104. Occupational Safety and Health Act of 1970.

Public Law 91-596

91st Congree, S. 2193

December 29, 1970.

This pamphlet is the complete text of the law.

105. COUNCIL ON OCCUPATIONAL HEALTH

Physician's guide to the occupational safety and health act of 1970.

JAMA 219: 905-907, Feb. 72. AMA Pub No. 320

The author lists some of the specific tasks required by the physician under OSHA, including recordkeeping. The author recognizes the physician's need for orientation into the field of occupational medicine and includes a bibliography or references, in the article, relating to preventive and occupational health.

106. GOLDSTEIN, D. H.

The occupational safety and health act of 1970.

AJN 71: 1535-1538, Aug. 71.

Provisions of OSHA are cited, and operations of the act are presented, including complaints of violations, penalties for violations, and the recordkeeping system. With pressure on industry to conform to state and local standards for occupational health, the need for safety and health manpower in industry increases.

107. KEY, M. M.

The occupational safety and health act and the Department of Health, Education, and Welfare.

OHN 20: 7-10, Feb. 72.

The author describes the functions of NIOSH as related to OSHA. The article presents more specifically what NIOSH can offer occupational health nurses in terms of reading materials and inservice education.

108. LEE, J. A.

The plant nurse and OSHA.

Chemtech: 483-485, Aug. 74.

The author reviews the traditional role of the plant nurse before discussing the expanded role as implied by OSHA. The plant nurse must be made more aware than ever before of the work environment and its effect on the employee patient. To gain this new awareness, the nurse needs to become better informed about toxicology, occupational diseases, dose and response reactions, medical and environmental monitoring of workers and the work site, job demands and man job interactions.

109. NORTON, M. C.

Implications of OSHA for hospitals uncertain.

Hospitals 43: 82-89, May 74.

Issues about OSHA that concern hospital administrators include the role of hospital departments in compliance with the Act, the respite they can expect in meeting cost of compliance with OSHA and OSHA standards that should be used as guidelines for compliance.

110. PACELA, A. F.

Introduction to the occupational safety and health act of 1970.

Supplement Newsletter of Biomedical Safety and Standards: Dec. 71.

OSHA and its implications for hospitals is described in the article. A brief summary of the recordkeeping procedures, inspection authority, fines, standards and inspection rights are presented. Several reprints on the compliance officer and questions about the act are also included in the booklet.

111. PHILLIPS, D.

The occupational safety and health act of 1970.

Hospitals 46: 33-37, May 72.

The author presents the hospital administrators' view of the Occupational Safety and Health Act of 1970. Specifically included in the article are sections pertaining to variances, standards of the Act and compliance officer use of citations. The last section emphasizes steps that hospital administrators may need to use to comply with the Act.

V. SOURCES FOR CONSULTATION AND ASSISTANCE

The following organizations having special interest in occupational safety and health may be of assistance to hospital administrators and other personnel who wish to improve and extend occupational health services. Most of the organizations provide a list of publications upon request and also publish journals or newsletters.

American Association of Industrial Nurses (AAIN)
79 Madison Avenue
New York, New York 10016

Journal:
Occupational Health Nursing
Chas. B. Slack, Inc.
6900 Grove Road
Thorofare, New Jersey 08086

American Board for Occupational Health Nurses, Inc. (ABOHN)
521 W. Westfield Avenue
Roselle Park, New Jersey 07204

Application Kit for Certification

American Conference of Governmental Industrial Hygienists (ACGIH)
1014 Broadway
Cincinnati, Ohio 45202

Newsletter, Guides

American Hospital Association (AHA)
840 North Lake Shore Drive
Chicago, Illinois 60611

Journal:
Hospitals, Journal of the American Hospital Association
(Same address)

American Industrial Hygiene Association (AIHA)
25711 Southfield Road
Southfield, Michigan 48075

Journal:
American Industrial Hygiene Association Journal
66 S. Miller Road
Akron, Ohio 44313

American Medical Association (AMA)
Division of Scientific Activities
Department of Environmental, Public, and Occupational Health
535 N. Dearborn Street
Chicago, Illinois 60610

Journal:
Journal of the American Medical Assoc.
Archives of Environmental Health
(Same address)

American Nurses' Association (ANA)
2420 Pershing Road
Kansas City, Missouri 64108

Journal:
American Journal of Nursing
The American Journal of Nursing Company
10 Columbus Circle
New York, New York 10019

American Occupational Medical Association (AOMA)
150 North Wacker Drive
Chicago, Illinois 60606

Journal:
Journal of Occupational Medicine
P.O. Box 247
Downers Grove, Illinois 60515

American Public Health Association (APHA)
1015 Eighteenth Street, N.W.
Washington, D.C. 20036

Journal:
American Journal of Public Health
(Same address)

Joint Commission on Accreditation of Hospitals (JCAH)
645 North Michigan Avenue
Chicago, Illinois 60611

Information on Accreditation

National Council for Radiation Protection (NCRP)
Washington, D.C. 20008

National Fire Protection Association (NFPA)
60 Batterymarch Street
Boston, Massachusetts 02110

List of Publications on Codes, Guides, Standards

National Safety Council (NSC)
425 North Michigan Avenue
Chicago, Illinois 60611

List of Publications, Films, Posters

U.S. Atomic Energy Commission
Washington, D.C. 20545

U.S. Department of Health, Education and Welfare, Center for Disease Control

National Institute for Occupational Safety and Health (NIOSH)
Office of Technical Publications
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, Ohio 45226

List of Publications

U.S. Department of Labor
Occupational Safety & Health Administration (OSHA)
Washington, D.C. 20219

List of Publications, OSHA Standards

U.S. Government Printing Office
Superintendent of Documents
Washington, D.C. 20402

VI. GLOSSARY OF OCCUPATIONAL HEALTH TERMS

EMPLOYEE

An employee is any person engaged in activities for an employer from whom he receives direct payment for his services. Included are working owners and officers. *USAS 216:1 - 1967.*

EXPOSURE

The total number of employee-hours worked by all employees including those in operating, production, maintenance, transportation, clerical, administrative, sales and other activities. *USAS 216:1 - 1967.*

HEALTH

A condition of complete physical, mental and social health and not merely the absence of disease or infirmity. *World Health Organization.*

INDUSTRIAL HYGIENE

Industrial Hygiene is that science and art devoted to the recognition, evaluation and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well being, or significant discomfort and inefficiency among workers or among the citizens of the community. *The American Industrial Hygiene Association.*

INDUSTRIAL HYGIENIST

An industrial hygienist is a person having a college or university degree or degrees in engineering, chemistry, physics, or medicine or related biological sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities: (1) to recognize the environment factors and to understand their effect on man and his well being; (2) to evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of these stresses in terms of ability to impair man's health and well being; and (3) to prescribe methods to eliminate, control or reduce such stresses when necessary to alleviate their effects. *The American Industrial Hygiene Association.*

OCCUPATIONAL DISEASE

1. An occupational disease is one arising out of and in the course of employment; a causal relationship must be established between the worker's illness and his occupational exposure. Whether or not the illness has resulted from a potentially hazardous occupational environment depends on the character, intensity and duration of exposure. AMA, *Guide to Diagnosis of Occupational Illness,* AMA #278, Revised 1974.

2. An occupational disease is a disease caused by exposure to environmental factors associated with employment. ANSI, *Methods of Recording & Measuring Work Injury Experience* 216, 1967, NY.

OCCUPATIONAL HEALTH NURSING

1. Occupational health nursing is the application of nursing and public health procedures for the purpose of conserving, promoting and restoring the health of individuals and groups through their places of employment. Brown, M. L.: *Occupational Health Nursing,* Chapter II, Page 15, Springer, NY, 1956.

2. Occupational health nursing is the application of nursing principles in conserving the health of workers in all occupations. It involves prevention, recognition and treatment of illness and injury, and requires special skills and knowledge in the fields of health education and counseling, environmental health, rehabilitation, and human relations. American Association of Industrial Nurses - 1968.

3. Occupational health nursing is that specialty which applies professional nursing principles in developing and carrying out a nursing service tailored to the changing environment of the specific company as well as the needs of its employees. American Nurses' Association - 1968.

OCCUPATIONAL HEALTH PROGRAM

1. The term "occupational health program" as used in this statement, means a program, provided usually by management, to deal constructively with the health of employees in relation to their work. AMA, *Scope, Objectives, and Functions of Occupational Health Programs* Revised 1971. AMA Pub. #213.

2. An occupational health program is a service provided by the management of a company, business, or organization to deal constructively with the health of its employees through the maintenance of a healthful work environment. It consists of competent professional emergency care and rehabilitation of the ill and injured as well as encouragement of maximum personal health habits. The objectives of management for the health of employees are met by employing staff specialists from medicine, nursing, safety, and industrial hygiene to give direct educational and consultative services. American Nurses' Association - 1968.

OCCUPATIONAL INJURY

A work injury is an injury (or occupational disease) suffered by a person which arises out of and in the course of his employment; i.e. resulting from work activity or environment of employment. ANSI, *Method of Recording and Measuring Work Injury Experience* 216 NY 1967.

OCCUPATIONAL MEDICINE

1. Occupational medicine deals with the restoration and conservation of health in relation to work, the working environment, and maximum efficiency. It involves prevention, recognition and treatment of occupational disabilities and requires the application of special techniques in the fields of rehabilitation, environmental health, toxicology, sanitation, and human relations. Industrial Medical Association.

2. A sub-specialty field of preventive medicine concerned with: (1) the appraisal, maintenance, restoration, and improvement of the health of the worker through application of principles of preventive medicine, emergency medical care, rehabilitation, and environmental medicine; (2) the promotion of a productive and fulfilling interaction of the worker with his work, through the application of principles of human behavior; (3) the active appreciation of the social, economic, and administrative needs and responsibilities of both the worker and the work community; and (4) a health and safety team approach involving cooperation of the physician with occupational hygienists, occupational nurses, safety personnel and toxicologists. American Occupational Medical Association, *JOM* Vol 17, No. 6, 1975.

SAFETY ENGINEER

Safety Engineering is that specialty branch of professional engineering which requires such education and experience as is necessary to understand the engineering principles essential to the identification, elimination and control of hazards to man and property; and requires the ability to apply this knowledge to the development, analysis, production, construction, testing, and utilization of systems, products, procedures and standards in order to eliminate or optimally control hazards. The above definition of Safety Engineering shall not be construed to permit the practice of civil, electrical or mechanical engineering. State of California, Board of Registration for Professional Engineers.

THRESHOLD LIMIT VALUES FOR PHYSICAL AGENTS

Threshold limit values refer to levels of physical agents and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. Threshold limit values refer to levels of exposure for an 8-hour workday for a 40-hour work week. ACGIH, Cincinnati 1970.

THRESHOLD LIMIT VALUES OF AIRBORNE CONTAMINANTS

Threshold limit values refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. Threshold limit values refer to time-weighted concentrations for a 7-8 hour workday and 40-hour work week. ACGIH, Cincinnati 1970.

APPENDIX A

INSTRUCTIONS FOR COMPLETING QUESTIONNAIRE FOR HOSPITAL EMPLOYEE HEALTH SERVICES SURVEY

The information supplied by this questionnaire will be treated as confidential and will be used for statistical purposes only.

The questions in this survey are of two basic types: some may be answered by marking an "X" in a closed box (X), others will require writing a number in a box (5). The small numerals near the boxes are for data processing only and should be disregarded.

Some questions with closed boxes call for a "Yes" or "No" answer.

Example: Do you have a routine immunization program? ☐ ☐

Another kind of closed box question calls for more than one box to be marked.

Example: For which of the following is a physical examination required? (Check all applicable boxes)

Applicants for Full-Time Employment ..... ☐
Applicants for Part-Time Employment ..... ☐
Employees Returning from Illness or Absence ..... ☐
Terminating Employees ..... ☐
None of the above ..... ☐

Another kind of closed box question requires selection of a single answer from a list provided, and marking the box indicating the answer selected.

Example: To whom is the nurse administratively responsible?

The Physician in Charge of Employee Health Services ..... ☐
The Director of Nursing ..... ☐
The Hospital Administrator ..... ☐
The Personnel Director ..... ☐
Other (specify) ..... ☐

The open-box question will require a numerical answer that you will be asked to provide from information contained in your records. In this type of question, open boxes will be connected ( ), and each selection should be filled.

Example: How many hours per week does the nurse spend in this assignment: (Enter 1 hour as 01, 3 hours as 03, etc.)

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
OCCUPATIONAL HEALTH PROGRAMS
HOSPITAL SURVEY

ASSURANCE OF CONFIDENTIALITY

The United States Public Health Service hereby gives its assurance that your identity and your relationship to any information obtained by reason of your participation in the Hospital Employee Health Services Survey will be kept confidential in accordance with PHS Regulations (42 CFR 1.101—1.108) and will not otherwise be disclosed.

SECTION A. GENERAL INFORMATION ☐ 1

(Computer Generated Mailing Label)

2 3 4 5 6 7 2 3 4 5 6 7

SECTION B. ORGANIZATION AND ADMINISTRATION OF EMPLOYEE HEALTH SERVICES

I. Policies and Practices

1. Has your hospital established a formal program (i.e., based on written guidelines or directives) for the provision of occupational health care to employees?

Yes	No	
1 ☐	2 ☐	8

2. Who is the primary source for day–to–day health care services to employees in your hospital?

(Check one)

Occupational Health Nurse	1 ☐	
Floor Nurse	2 ☐	
House Physician	3 ☐	
Outpatient Department Staff	4 ☐	9
Emergency Room Staff	5 ☐	
Other (specify) _____	6 ☐	
None of the above	7 ☐	

3. If a worker requires treatment for an injury or illness on the job, where is the treatment usually obtained?

(Check one)

Emergency Room	1 ☐	
Outpatient Clinic	2 ☐	
Employee Health Unit	3 ☐	10
Other (specify) _____	4 ☐	
None of the above	5 ☐	

4. Do you have a separate room or facility exclusively for the health care of hospital employees?

Yes	No	
1 ☐	2 ☐	11

If the answer to question 4 is yes, please answer the following.

a. Is the facility staffed by regularly assigned personnel?

Yes	No	
1 ☐	2 ☐	12

b. When is the facility open or accessible to employees?

(Check all applicable boxes)	Day Shift	Evening Shift	Night Shift
Monday	☐ 13	☐ 20	☐ 27
Tuesday	☐ 14	☐ 21	☐ 28
Wednesday	☐ 15	☐ 22	☐ 29
Thursday	☐ 16	☐ 23	☐ 30
Friday	☐ 17	☐ 24	☐ 31
Saturday	☐ 18	☐ 25	☐ 32
Sunday	☐ 19	☐ 26	☐ 33

5. If there is no separate facility, or when this facility is not open, do employees receive care within your hospital?
   Yes 1 ☐ No 2 ☐ **34**

6. Is an employee normally seen by a physician or nurse who provides occupational health care:
   Before going home due to illness or injury? Yes 1 ☐ No 2 ☐ **35**
   Upon return to work after illness or injury? Yes 1 ☐ No 2 ☐ **36**

7. Does your hospital have a formal policy with respect to pregnancy which includes provisions for:
   (Check all applicable boxes)
   Early Reporting of Pregnancy ☐ **37**
   Medical Clearance to Continue Employment ☐ **38**
   Reassignment to Safer Working Conditions ☐ **39**
   Maternity Leave ☐ **40**
   Pre and Postnatal Counseling by Empoyee Health Services ☐ **41**
   None of the above ☐ **42**

II. Staffing

8. Which physician (or physicians) has responsibility for medical treatment of job–related health problems?
   (Check all applicable boxes)
   House Physician ☐ **43**
   Outpatient Physician ☐ **44**
   Emergency Room Physician ☐ **45**
   Physician on Call ☐ **46**
   Employee's Family Physician ☐ **47**
   Other (specify) _____ ☐ **48**
   None of the above ☐ **49**

9. How many hours per week does he spend in this assignment?
   (Enter 1 hour as 01, 3 hours as 03, etc.) 50 51

10. Is there a registered nurse (or nurses) whose primary responsibility is the provision of employee health services?
    Yes 1 ☐ No 2 ☐ **52**

    If the answer to question 10 is yes, please answer the following.

    a. How many hours per week does the nurse spend in this assignment:
       (Enter 1 hour as 01, 3 hours as 03, etc.) 53 54

    b. To whom is the nurse administratively responsible?
       (Check one)
       The Physician in Charge of Employees Health Services 1 ☐
       The Director of Nursing 2 ☐
       The Hospital Administrator 3 ☐ **55**
       The Personnel Director 4 ☐
       Other (specify) _____ 5 ☐

    c. How is the nurse usually given medical direction to provide employee health care?
       (Check one)
       Other (specify) _____ 1 ☐
       Written Individual Orders 2 ☐ **56**
       Written Standing Orders 3 ☐

SECTION C. PROVISION OF OCCUPATIONAL HEALTH SERVICES

11. Which of the following health services are offered for the benefit of employees?
(Check all applicable boxes)

Care for illness	☐ 57
Care for Injury	☐ 58
Physical Examinations	☐ 59
Multiphasic Screening	☐ 60
Immunizations	☐ 61
Counseling of Workers With Personal, Family Health, or Social Problems	☐ 62
Physical Therapy	☐ 63
Rehabilitative Services	☐ 64
Health and Safety Education	☐ 65
None of the above	☐ 66

I. Examinations

12. For which of the following is a physical examination required?
(Check all applicable boxes)

Applicants for Full–Time Employment	☐ 67
Applicants for Part–Time Employment	☐ 68
Employees Returning from Illness or Absence	☐ 69
Terminating Employees	☐ 70
None of the above	☐ 71

13. Are employees who transfer within the hospital given preplacement examinations to determine their ability to meet specific job requirements? Yes 1 ☐ No 2 ☐ 72

14. On which of the following employees are periodic examinations performed?

All Employees (If you check this box, do not check boxes below)	☐ 73
Employees in Certain Age Groups (e.g., Over 40, etc.)	☐ 74
Employees in Selected Job Categories	☐ 75
None of the above	☐ 76

15. If routine physical examinations are given, which of the following tests are included? ☐ 1

(Check all applicable boxes)

Blood Tests:	All Employees	Employees in Certain Age Groups	Employees in Selected Job Categories
Complete Blood Count (CBC)	☐ 8	☐ 18	☐ 28
Blood Sugar	☐ 9	☐ 19	☐ 29
Cholesterol	☐ 10	☐ 20	☐ 30
Serology (VDRL, Hinton, etc.)	☐ 11	☐ 21	☐ 31
Urinalysis	☐ 12	☐ 22	☐ 32
Chest X–Ray	☐ 13	☐ 23	☐ 33
Electrocardiogram	☐ 14	☐ 24	☐ 34
Vision Tests	☐ 15	☐ 25	☐ 35
Other (specify) _____	☐ 16	☐ 26	☐ 36
None of the above	☐ 17	☐ 27	☐ 37

II. Immunizations

16. Do you have a routine immunization program? Yes 1 ☐ No 2 ☐ 38
If the answer to question 16 is yes, please answer the following:

a. Is the program based on written policies and procedures? Yes 1 ☐ No 2 ☐ 39

b. Which of the following do you provide routinely?

(Check all applicable boxes)

	All Employees	Employees in Certain Age Groups	Employees in Selected Job Categories
Tetanus	☐ 40	☐ 48	☐ 56
Smallpox	☐ 41	☐ 49	☐ 57
Influenza	☐ 42	☐ 50	☐ 58
Diphtheria	☐ 43	☐ 51	☐ 59
Polio	☐ 44	☐ 52	☐ 60
Immune Serum Globulin (for Hepatitis)	☐ 45	☐ 53	☐ 61
Other (specify)_____	☐ 46	☐ 54	☐ 62
None of the above	☐ 47	☐ 55	☐ 63

III. Health Counseling of Employees

17. Which of the following sources normally provide health counseling in your hospital?

(Check all applicable boxes)

Employee's Immediate Supervisor	☐ 64
Health Unit Physician	☐ 65
Health Unit Nurse	☐ 66
Other (specify)_____	☐ 67
None of the above	☐ 68

SECTION D. EMPLOYEE HEALTH RECORDS

18. Does your hospital have an established system for recording and maintaining health information on your employees?

Yes 1 ☐ No 2 ☐ 69

If the answer to question 18 is yes, please answer the following.

a. Which of the following are included in the employee health record?

(Check all applicable boxes)

Personal Health History	☐ 70
Occupational History	☐ 71
Physical Examination	☐ 72
Report of Injury	☐ 73
Report of Illness	☐ 74
Record of Visits to Clinic, Emergency Room, or Employee Health Nurse	☐ 75
Referrals	☐ 76
Workmen's Compensation Records	☐ 77
Other Insurance Claims	☐ 78

b. Where are your employee health records filed?

(Select answer which is closest or applies to most employees)

Employee Health Unit	1 ☐
Personnel Department	2 ☐
Emergency Department	3 ☐ 79
Outpatient Department	4 ☐
Other (specify)_____	5 ☐

c. Does your hospital have written policies and procedures governing access to and the release of employee health information?

Yes 1 ☐ No 2 ☐ 80

SECTION E. EMPLOYEE HEALTH STATISTICS ☐ 1

19. Do you keep employee absenteeism records?

(Check one)

Yes, Showing Specific Nature of Sickness when Absent	1 ☐	
Yes, Showing Only the Type of Absence	2 ☐	
Yes, Without Showing Type of Absence	3 ☐	8
No	4 ☐	

20. What is your rate of unscheduled absenteeism (days per year per employee)? (Enter 1 as 01, 3 as 03, etc.) 9 10

21. What are the most frequent causes of absenteeism among your employees? (Indicate all that apply in order of frequency of occurence by writing 1, 2, 3, 4.)

Illness	☐ 11
Injuries	☐ 12
Family Health Problems	☐ 13
Other or Unspecified Personal Problems	☐ 14

22. What are the **four** most frequent **occupational** health problems, excluding injuries, which have occurred in your hospital during the most recent **1–year** period for which you have records? (Indicate the four in order of frequency of occurrence by writing 1, 2, 3, 4.)

Dermatitis	☐ 15
Hepatitis	☐ 16
Other Infection	☐ 17
Radiation Illness or Exposure	☐ 18
Respiratory Problems	☐ 19
Volatile Organic Solvent Exposure	☐ 20
Drug or Medication Reactions	☐ 21

23. What are the **four** most frequent types of **injury** occurring in your hospital during the most recent **1–year** period for which you have records? (Indicate the four in order of frequency of occurrence by writing 1, 2, 3, 4.)

Back Injuries	☐ 22
Strains and Sprains	☐ 23
Fractures	☐ 24
Burns	☐ 25
Puncture Wounds (from Needles, etc.)	☐ 26
Lacerations	☐ 27
Abrasions and Contusions	☐ 28
Hernias	☐ 29
Eye Injuries	☐ 30

24. Please provide the following data for the most recent **1–year** period for which you have records.

(Indicate 1 as 0001, 10 as 0010, etc. If you do not have data for any item, mark boxes with XXXX.)

Number of Occupational Injuries 31 32 33 34

Number of Occupational Illnesses 35 36 37 38

Total Number of Injuries and Illnesses Involving Lost Time 39 40 41 42

Number of Cases for which Workmen's Compensation Claims were **Filed** 43 44 45 46

SECTION F. ENVIRONMENTAL HEALTH AND SAFETY CONTROL

I. Safety and Health Education

25. Do you provide safety and health orientation for new employees?

Yes, General Orientation	1 ☐	
Yes, Specific Job Orientation	2 ☐	
Yes, Both of the Above	3 ☐	**47**
No	4 ☐	

26. Does your hospital have a formally organized safety and health education program?

Yes	No	
1 ☐	2 ☐	**48**

If the answer to question 26 is yes, please answer the following:

a. Of the personal health topics listed below, which areas receive emphasis in your program?

(Check all applicable boxes)

Personal Hygiene	☐ **49**
Eye Health and Safety	☐ **50**
Drug Addiction	☐ **51**
Pregnancy	☐ **52**
Family Planning	☐ **53**
Venereal Disease	☐ **54**

b. Do you provide routine in-service training programs for the following?

(Check all applicable boxes)

Radiation Exposures	☐ **56**
Chemical Exposures	☐ **57**
Infectious Disease Exposure	☐ **58**
Safe Use of Equipment	☐ **59**
Use of Personal Protective Equipment or Clothing	☐ **60**
Proper Lifting and Body Mechanics	☐ **55**

II. Environmental Hygiene and Safety

27. Of the following departments or individuals:

Administrative Assistant (1)
Employee Health Service (2)
Engineering Maintenance (3)
Safety Committee (4)
Hospital Environmentalist (5)
Outside Consultant (6)
Other (specify)_____.....(7)

which have primary responsibility to perform the following environmental hygiene and safety functions in your hospital? (For each item below, enter the number of the best answer from the list above.)

Analyze Accident Reports ☐ **61**
Conduct Safety Inspections ☐ **62**
Evaluate Hazard Reports and Recommend Safety Improvements ☐ **63**
Monitor Hazard Corrective Actions ☐ **64**

28. Do hospital personnel conduct periodic inspections and report on the following?

	Yes	No	
Hospital Safety Equipment	1 ☐	2 ☐	**65**
Working Conditions Involving Health and Safety Hazards	1 ☐	2 ☐	**66**

29. Are air and biological sampling procedures regularly performed in your hospital for your employees (e.g., operating room gases, employee throat cultures, etc.)?

1 ☐ 2 ☐ **67**

SECTION G. SPECIAL INFORMATION

30. How many persons in the following categories perform services in your hospital? (Indicate 1 as 001, 10 as 010, etc.)

Contract Workers 68 69 70
Volunteers 71 72 73

31. Do you impose the same immunization requirements on contract workers and volunteers that you do on hospital employees?

	Yes	No	
Contract Workers	1 ☐	2 ☐	**74**
Volunteers	1 ☐	2 ☐	**75**

32. Do you provide the same health services for contract workers and volunteers that you do for hospital employees?

	Yes	No	
Contract Workers	1 ☐	2 ☐	**76**
Volunteers	1 ☐	2 ☐	**77**

33. Does any union or other formal employees' organization participate in development of policy and procedures for your health and safety programs?

Yes, Employee Health Program ..... 1 ☐
Yes, Safety Program ..... 2 ☐
Yes, Both Programs ..... 3 ☐ **78**
No, Neither Program ..... 4 ☐

34. Would you be interested in receiving a copy of the results of this survey and associated statistical analyses when they are published?

Yes 1 ☐ No 2 ☐ **79**

APPENDIX B

TECHNICAL NOTES

The hospitals to be studied were defined as:

1. Located in the United States, excluding Alaska, Hawaii, Commonwealths, territories, and trust areas.
2. Be a member of the American Hospital Association (A.H.A.)
3. Have 25 or more beds, excluding bassinets.
4. Have an average length of patient stay of 30 days or less.
5. Classified as non-Federal by the A.H.A.
6. Classified as other than an alcoholism, psychiatric, tuberculosis, or other respiratory disease hospital by the A.H.A.

Selection Methods

A copy of the 1970 National Hospital Facilities Inventory, on magnetic tape, was obtained from the National Center for Health Statistics. From the Inventory, a data file was constructed which contained the hospitals meeting the definition presented above. There were 5,311 hospitals included. This later reduced to 5,298 due to closings (See Tables 1 and 2).

This data was reviewed for each state (and the District of Columbia). If the number of hospitals in a State was 120 or less, all hospitals were included in the survey. If the number of hospitals in the State was greater than 120, the hospitals were stratified by number of beds:

Strata	Number of Beds
Small	25–99
Medium	100–299
Large	300 or more

Random sampling was conducted within each strata according to the following rules:

1. If 40 or less hospitals fall in a strata, all hospitals are included.
2. If more than 40 hospitals are in a strata, select 40 hospitals by simple random sampling methods.

There were 3,699 hospitals included in the survey.

Development of Form

In designing the questionnaire, the wording and format of each question was carefully constructed to insure that respondents would be able to understand what information was desired and to respond accordingly. Hundreds of questions were considered originally, but most were discarded. Only those that remained were the ones which best described the overall profile of the situation.

The survey form was then pre-tested in six hospitals from 88-698 beds and in three geographic locations. The results of the pre-test were as follows:

1. All items were completed by all respondents.
2. All respondents felt the instructions were clear and easily understood. There was one problem on how to rank in order of frequency (Items 22 and 23), since only two injuries and two occupational health problems occurred in the prior 12 months.
3. All respondents felt the survey form to be of a length and complexity which would not inhibit full and rapid response.

In addition, all respondents indicated that the survey form had brought at least one item to their attention where the hospital's program could be improved.

Conduct of the Survey

The mailing was made in early June, 1972. Upon receipt, the forms were logged, edited, and key punched. Closing of hospitals were verified and reduced the total of hospitals and the sample. The sample at completion was 3,687. In mid-July a follow-up post card was sent to each hospital not responding. In mid-September, the final tabulations were started.

The overall response rate was 72.4% but there was a wide variation among States (44% to 92%). The response rate by strata was:

Strata	Percent Responding
Small	65.2
Medium	76.7
Large	83.9

Telephone Survey

Since there was a wide variation of response

rates among strata, and states, it was felt necessary to examine whether there were biases introduced. A telephone survey of a sample of those hospitals which had not responded to the survey was conducted. The non-respondent hospitals were stratified by State and number of beds (small, medium, large). The sampling fraction was about one-third. There were 387 hospitals called with a response rate of 91.4%.

Questions asked were limited to a dozen (2, 3, 4, 4b, 10, 10c, 11, 14, 15, 16, 16b, 34). There were no significant differences found between the mail survey and telephone survey. Thus we can conclude that there are no detectable biases.

Projections

The results as presented are estimates of the total hospital population - 5,298.

The computer tabulations were prepared as follows:

1. For each strata (number of bed grouping) within each State, count the number of appropriate responses.
2. Multiply the result by the ratio of the entry for the population to the entry for the number of responses in the survey, both for appropriate State — bed size group.
3. Round the result to the next higher integer.
4. Accumulate the results to obtain state, regional, and national estimates.

Using this method, there can be (and were) slightly inconsistent results from table to table. These were adjusted to provide consistent total for each strata, geographic region, and answer to question. Usually there was no problem in this adjustment. If there was some doubt as to where the adjustment should be made, it was prorated on the basis of size — the largest getting the most increase or decrease.

TABLE 1

REGIONAL DISTRIBUTION OF THE 5,298 HOSPITALS INCLUDED IN THE STUDY POPULATION

U.S. BUREAU OF THE CENSUS DIVISIONS

1. New England — 277 hospitals
   - Connecticut
   - Maine
   - Massachusetts
   - New Hampshire
   - Rhode Island
   - Vermont

2. Middle Atlantic — 663 hospitals
   - New Jersey
   - New York
   - Pennsylvania

3. South Atlantic — 718 hospitals
   - Delaware
   - District of Columbia
   - Florida
   - Georgia
   - Maryland
   - North Carolina
   - South Carolina
   - Virginia
   - West Virginia

4. East North Central — 878 hospitals
   - Illinois
   - Indiana
   - Michigan
   - Ohio
   - Wisconsin

5. East South Central — 422 hospitals
   - Alabama
   - Kentucky
   - Mississippi
   - Tennessee

6. West North Central — 694 hospitals
   - Iowa
   - Kansas
   - Minnesota
   - Missouri
   - Nebraska
   - North Dakota
   - South Dakota

7. West South Central — 703 hospitals
   - Arkansas
   - Louisiana
   - Oklahoma
   - Texas

8. Mountain — 289 hospitals
   - Arizona
   - Colorado
   - Idaho
   - Montana
   - Nevada
   - New Mexico
   - Utah
   - Wyoming

9. Pacific — 654 hospitals
   - *Alaska
   - California
   - *Hawaii
   - Oregon
   - Washington

*States omitted from this study

Source of Data NIOSH *Hospital Occupational Health Services Study*, U.S., 1972.

TABLE 2

HOSPITAL POPULATION FROM WHICH SAMPLE WAS SELECTED, BY U.S. BUREAU OF THE CENSUS DIVISION, AND BY SIZE OF HOSPITAL[1]

U.S. Bureau of the Census division	Hospital population				Sample of hospitals			
		Hospital size[1]				Hospital size[1]		
	Total	Small	Medium	Large	Total	Small	Medium	Large
Total	5,298	2,710	1,824	764	3,687	1,799	1,221	667
New England	277	110	128	39	242	110	93	39
Middle Atlantic	663	162	327	174	341	99	127	115
South Atlantic	718	355	245	118	596	256	222	118
East North Central	878	338	365	175	557	205	198	154
East South Central	422	264	119	39	375	217	119	39
West North Central	694	449	174	71	591	345	174	72
West South Central	703	477	174	52	412	238	122	52
Mountain	289	186	77	26	289	186	77	26
Pacific	654	369	215	70	284	143	89	52

[1]Hospital Size based upon number of beds: (Small: 25-99) (Medium: 100-299) (Large: 300+)
Source of Data: NIOSH *Hospital Occupational Health Services Study*, U.S., 1972.

☆U.S. GOVERNMENT PRINTING OFFICE: 1976 - 657-696/5546

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HEW Publication No. (NIOSH) 76-115