AN OCCUPATIONAL HEALTH NURSING COMPUTER APPLICATION IN MEDICAL CARE: AN ARMY APPROACH

MAJ Mary K. McKenna, ANC
Division of Preventive Medicine
Walter Reed Army Institute of Research
Washington, D.C. 20307

Abstract

Occupational health nursing has become an increasingly important specialty in the field of nursing during this century. In the broadest concept, occupational health is concerned with all factors which influence the health of people at work. Nurses, as well as other health care professionals, are attempting to apply the evolving technology of the computer to the direct client care applications in the workplace. One such relevant use of the computer has been that of targeted disease surveillance in an occupational health setting. This paper will address the process utilized by community health nurses to assess, plan, implement and evaluate a computerized disease surveillance program in an occupational health setting. The program was a joint effort between the United States Army Medical Department Activity, Fort Irwin, California and the Epidemiology Consultant Service of the Division of Preventive Medicine, the Walter Reed Army Institute of Research, Washington, DC. (WRAIR).

Background

Occupational health nursing traces its early roots back over some 100 years to the home, family and community. First identified as industrial nursing and later by 1895, as occupational health nursing, the field has grown to over 20,000 nurses practicing in the United States alone.

The definition of occupational health nursing has been addressed by various authors including, Brown, Page, Proser and Walker, to name but a few. In the broad aspect, occupational health nursing combines and applies both public health and nursing philosophy and skills to the relationship of individuals to their occupations. The overall purpose being that of prevention of injury and disease and the promotion of optimal health, social adjustment and productivity.

Due to recent legislation and evolving social pressures the philosophy of nursing is changing in the area of occupational health. According the Proser, nurses are now being recognized for their abilities and contributions in the development of health care for individuals.

Occupational health nurses are now according to Cahall, being viewed as those who direct health in the workplace and thereby influence the health of the family and community as well. With the broad implication of their effects on health, felt in the community, these nurses then must utilize an increasingly complex level of assessment and evaluation to solve the daily problems confronting them.

Dyal has described one approach to problem solving utilizing the nursing process (systems theory) in performing a plant profile. I would now like to describe another application of systems theory in approaching the task of establishing a disease surveillance program and with the technology of the 80's computerizing the system.

History of the problem

The Department of Army recently designated Fort Irwin, California as the National Training Center. The reservation is the largest Army post in the United States in terms of land mass consisting of one thousand square miles or over 642,820 acres. This installation is located in the heart of the Mojave Desert and thus provides an excellent opportunity to conduct desert training exercises. It is estimated that by 1984, 80,000 troops will train annually at Fort Irwin with units spending about two to four weeks on site. A training cadre of several thousand will be ultimately assigned as permanent party to Fort Irwin.

Concerns have been expressed over the possibility that desert training at Fort Irwin might produce valley fever infections due to exposure to the dust borne arthropores of the fungus Coccioides immitis. These concerns were based on the knowledge that several areas of the arid southwestern United States are endemic for coccioidiomycosis and that the installation is located within one of these locations. Military installations near Fort Irwin, such as Edwards Air Force Base and Twentynine Palms Naval Base, have had documented human valley fever infections. There had been no clearly established cases of valley fever traced to exposure at Fort Irwin, but it is clear that this infectious agent can represent a health threat in this setting.
The overall surveillance program was envisioned to consist of several phases: first, newly assigned permanent employees, both military and civilian, would be requested to enter a questionnaire; second, the individuals would be evaluated for their reaction to Spherulin; third, those having a negative skin test reaction would be followed with serial skin tests, yearly, or on their departure date; fourth, the information collected would be of assistance in understanding the epidemiology of coccidioidomycosis.

Assessment

A meeting took place between a member of the Epidemiology Consultant Service (EPICON) team, the Hospital Commander (who was also the Preventive Medicine Physician) and the Community Health Nurse (CHN) at Fort Irwin. The outcome was the development of a surveillance program with the EPICON team providing the questionnaires for data collection, computer support for data analysis and roster generation. The Fort Irwin Preventive Medicine Activity, Community Health Nurse would assume the position as onsite program supervisor since the occupational health nurse was not yet on staff. At the inception of this program, the Medical Department Activity (MEDDAC) at Fort Irwin had no Automated Data Processing (ADP) capability to utilize in establishing the surveillance program. Even though questionnaire information wascomputerized, it was appreciated longer than the computer support located at the WRAIR, the time saved in data retrieval and analysis outweighed the alternative of having a cumbersome, old-fashioned, paper file system at Fort Irwin.

Planning

At Fort Irwin the community health nurse was involved with designing the actual process of patient flow and entry into the surveillance program. In addition she determined how the data to be collected would be processed in a timely, effective and efficient manner and how the results would be forwarded to the WRAIR for data entry, evaluation, and analysis. This phase of planning at Fort Irwin occurred simultaneously with the planning taking place at the WRAIR.

The community health nurse member of the EPICON team at the WRAIR, gathered questionnaires from recent screening programs in order to develop a data gathering tool that would satisfy a number of specific criteria. The tool had to be: first, appropriate for gathering information on coccidioidomycosis; second, able to be self administered, simple, and easy to answer in a short period of time; third, composed of retrievable data elements that would be used to prepare a quarterly Occupational Health Report; fourth, able to elicit information that would assist in notifying the individual when to return for further skin testing and/or examination.

Implementation

Once the planning process was completed the implementation phase was initiated. The generated questionnaires were sent to the community health nurse at Fort Irwin who in turn, distributed the questionnaires to the Immunization Clinic at the WRAIR. The clinic had been designated as the entry point for employees into the surveillance program. The completed questionnaires were periodically sent to the WRAIR, entered into the Digital Vax 11/780 minicomputer and analyzed.

The implementation phase proceeded with consideration being given to the following steps.

1. Identify and define data elements from the survey questionnaire.
2. Code and enter into the Vax 11/780 files the defined data elements.
3. Write computer programs in BASIC language to generate output reports.
4. Generate output reports to meet requirements of the Department of Army as well as the Occupational Safety and Health Act (OSHA).
5. Develop rosters by Units (work sites) of all employees enrolled in the program.
6. Establish a scheduling system for repeat screening visits by unit and month which would allow the nurse to: a) generate rosters 30 days prior to testing; b) send rosters to units involved; c) follow up on employees who failed to appear for testing; d) Return surveillance information to the WRAIR.
7. Update existing data files as additional information was received at the WRAIR.

Evaluation

The Occupational Health Surveillance Program has been in place now for a little more than one year. Medical information on over 1936 permanently assigned employees had been entered into the data file. The many man hours previously utilized to record such surveillance data by paper and pencil have been available to be allocated to other important elements of the Occupational Health Program. The occupational health nurse at Fort Irwin now has not only a new method but also a tool
to provide additional quality, timely and effective preventive health care to the population for which she has responsibility.

Further applications of the computer in this surveillance program remain to be explored. For example, a user friendly format could be developed to allow each employee to input some of his own information. This procedure would save input and turn around time in processing the data. Health education information could be developed by the occupational health nurse and be available via computer to the employees' enrolling in the surveillance program.

The design and development of the surveillance system described in this paper demonstrates one way computer technology can be utilized in solving practical, everyday problems of occupational health nursing practice.

"The views of the author do not purport to reflect the position of the Department of the Army or the Department of Defense," (para 4-3, AR 360-5).

References


