Use of Marginal Punched Data Cards in Surveillance of Hospital-Acquired Infections

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TNFECTIONS acquired during hospitalization constitute a significant hazard to patients' health and contribute to the increasing cost of medical care (1). Contemporary approaches to reducing this hazard center about systems of infection surveillance. Investigators at the Center for Disease Control, Health Services and Mental Health Administration, have carefully developed model surveillance methods which have been tested in selected community hospitals (2-4) and are now rapidly being introduced into many hospitals across the country. Such systems usually employ nurse-epidemiologists who use a

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The development of the method reported was supported in part by Public Health Service grants A1-03082 and A1-00323. Tearsheet requests to Lewis B. Lefkowitz, Jr., M.D., Department of Preventive Medicine and Public Health, Vanderbilt University School of Medicine, Nashville, Tenn. 37203. variety of data-gathering techniques to calculate infection rates, identify problems, and effect remedial measures (5-7).

Although there have been problems in implementing methods of data collection, hospital epidemiologists may have their greatest difficulty in analysis of the data, without which appropriate control measures cannot be instituted. As most programs use various forms (8- by 11-inch sheets), a major impediment to rapid analysis is the cumbersome mass of paper to sort and tabulate. At present, only a few hospitals have access to computers that are free to be used to store and retrieve information on hospital-acquired infections. We describe in this report the use of specifically designed cards which can be punched on the margins to record information concerning each hospital-acquired infection. This card is simple, inexpensive, compact, and allows rapid analysis of data.

Methods and Discussion

The techniques of surveillance and definitions of what constitutes a hospital-acquired infection have been carefully detailed elsewhere (1-3). At the Vanderbilt University Hospital, the nurse-epidemiologist identifies those patients considered likely to have hospital-acquired infections and completes the patientinfection card (see chart) during

her work rounds, using data obtained from the patient's chart and from the bacteriology laboratory. The card is stamped with the patient's identification, and the nurse checks the appropriate boxes around the margin. She also records additional pertinent information on the card. Comments and progress notes may be entered in the remarks section and on the reverse side of the card.

A separate card is used for each hospital-acquired infection. A patient with both hospital-acquired urinary tract and surgical wound infections would have two cards. If the urinary tract infection also produced a secondary bacteremia, this fact would also be noted on the card describing the urinary tract infection. A "primary" bacteremia associated with an intravenous catheter, however, would be recorded on a card. Antimicrobial separate drugs are checked only if they have been given within the 72 hours preceding the first positive culture. Decisions on whether or not the infection was hospital acquired are made by the hospital epidemiologist.

The 8- by 5-inch card fits comfortably into the side pocket of most laboratory coats and is thick enough to file easily. The checked spaces on the card are punched daily in the office. When the card has been completed, it can be used immediately to collate clinical, bacteriological, and epidemiologic information. It may be modified with relative ease when new antibiotics are introduced or if it becomes apparent that micro-organisms not listed are being encountered frequently. For example, the card may be modified to include such antibiotics as gentamicin and carbenicillin and the micro-organCard of patient with a hospital-acquired urinary tract infection caused by *Klebsiella* species. The Foley catheter is a predisposing factor



Note: Card is manufactured and printed by Litton Automated Business Systems, 310 Philfre Ct., Nashville, Tenn. 37217.

isms *Serratia* and *Candida*. Additional predisposing factors may also be incorporated, because there are several blank spaces on the card for additional information.

If computer facilities are readily available for use in a hospital infection surveillance program, considerably more data can be collected and stored regarding predisposing factors, characterization of infections, antimicrobial sensitivity patterns of micro-organisms. and other pertinent data. Such facilities offer clear advantages over the marginal punched cards, provided the epidemiologist has ready access to the information through a computer terminal. Many institutions do not yet have the capability of producing such useful but more elaborate analyses. These hospitals should find the card useful in collating data, so as to produce regular surveillance reports, and to alert epidemiologists to current problems. In our experience, a

particular advantage of these cards has been the ease and speed with which retrospective analyses have been carried out as specific questions have arisen.

Summary

The use of marginal punched cards for recording surveillance data on hospital-acquired infections provides a current, convenient, rapidly analyzable source of information on the status of such infections in the Vanderbilt University Hospital. Its use for tabulation, calculation, and analysis is simple and rapid. It is especially suited to those hospitals that do not have access to computers for surveillance of infections.

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