(continued from page 408)
"standard integrated data-base/spreadsheet/word processing programs," one would have to question the wisdom, in terms of people-hours, amount of user frustration and quality of output, demonstrated by such a decision. Generic data-base/spreadsheet software, which would generate basic rates and graphs, is not designed to accommodate epidemiologic analyses and reporting.

How many infection control practitioners would have the specific knowledge required to customize a standard data-base/spreadsheet program to fit their needs as well as a commercial product already developed and on the market? An infection control department would either have to have access to a computer programmer or have personnel extremely knowledgeable in programming before it could justify the time expended to both program and learn an infection control software system "built" from a generic data-base/spreadsheet program.

In addition, consider the number of applications an ICP would have to master if he or she wanted to perform statistical operations beyond the scope of rate calculation. Why learn a data-base/spreadsheet program and a statistics package (file compatability is an important detail to consider when switching between software applications) when there are infection control software packages available that combine features of both?

In most hospitals today, time is money, and it would seem that an infection control department would be "re-inventing the wheel" if it chose to bypass ready-developed software in favor of starting from scratch and creating its own program. While standard data-base/spreadsheet programs may appear to be more cost-effective, it is important to think of long-term costs, such as people-hours required to set up and run the program, technical support from the software company (that may lack the infection control department's specific expertise) and how well the program will continue to serve the department, long after the department programmer has gone.

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Semi-Automated Infection Control Surveillance in a Veterans' Administration Medical Center

To the Editor:

The practice of hospital epidemiology and infection control in the long-term care setting can be greatly facilitated by abbreviated, cost-saving surveillance techniques. Traditional "gold standard" total hospital surveillance has become highly resource-consuming, particularly in the milieu of staffing shortages. Microbiologic-based abbreviated techniques have been demonstrated in the literature is as being effective methods for collecting necessary infection data. We illustrate a new variation of the microbiology laboratory's ongoing role as a critical component of the hospital infection control program, in the chronic as well as the acute care setting.

At our institution, a 600-bed veterans' administration medical center (VAMC) with predominantly long-term care and neuropsychiatric services, microbiologic epidemiology reports are available through the VAMC systemwide decentralized hospital computer program (DHCP). Specifically, urinary tract infections (UTI), methicillin-resistant *Staphylococcus aureus* (MRSA) isolates and bacteremias are tracked by using the "Infection Control Survey" menu of the DHCP laboratory package.

The indications for microbiologic sampling at our VAMC are problem-oriented, based upon symptomatic needs of the patients. To date, there are no culture protocols that would skew the accumulation of line-item culture data. One inherent difficulty with this approach is the generic exclusion of nonbacterial infectious agents. Most of these pathogens are associated with viral upper respiratory and gastrointestinal syndromes. However, specialized extramural reference laboratories are occasionally needed for mycobacteria and other low-prevalence microorganisms.

Although one can elect to directly use individual isolate line-item entries for subsequent rate data calculations, it is more clinically appropriate to couple such line-items with focused chart reviews. In this manner, approved surveillance definitions can be applied to assess whether or not a given isolate represents either true infection or colonization. Furthermore, important supplemental data, such as antibiotic use, can be included, thus enabling ready referral of the data to other committees and/or clinical services.

Any surveillance system must be user-friendly; therefore, automated approaches should be correspondingly accessible to infection control staff with varying degrees of computer experience. The system developed at our VAMC depends upon standard "templates" to which further detail is added. These templates represent the actual reports that are generated from the laboratory system using a few simple commands. Any facility with access to DHCP, or a similar type of total hospital system, can certainly choose to program in additional features, using pharmacy, patient information, etc. data bases.

Figure 1 illustrates a line-itemization of urine culture isolates, by collection date, from a fictitious long-term care ward, with added chart review data. Three major points of epidemiol-

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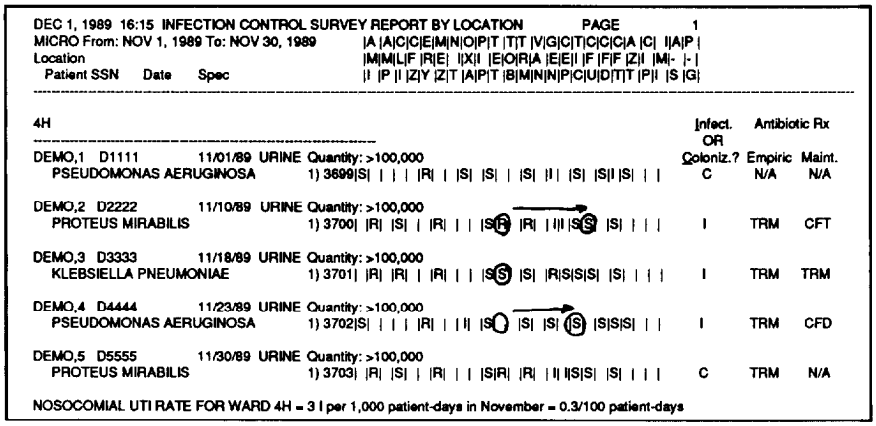
ogic interest should be noted. First, this line listing of isolates by ward, in itself, provides the impetus for preferentially performing focused reviews on certain wards. As a result, the "Infection Control Survey" can serve as a ward-by-ward total hospital screen for, in this case, UTIs.

Second, the monthly nosocomial UTI incidence rate can be calculated by dividing the total number of infections (I) by the total number of patient-days on the ward for that month (arbitrarily set at 1,000 [Figure 1]). The patient-days denominator is highly applicable for a low turnover, long-term care patient population. Average daily census is another convenient long-term care denominator.

Third, note that the superimposition of typed entries onto the UTI template enables chart review results to be integrated with the individual automated line entries. The inclusion of the antibiogram is of considerable value for performing empiric/maintenance antibiotic therapy surveillance, as well as determining possible species uniqueness during clusters or outbreaks. Antibiogram identity patterns are an appropriate screening tool prior to the eventual possibility of needing reference techniques, such as plasmid profiling.

In similar fashion, Figure 2 illustrates a line entry from the MRSA template, which also has a built-in quality assurance monitor for contact isolation initiation. Figure 3 demonstrates the bacteremia template. However, one must employ caution when using microbiologic culture data as "signal" events for possible infection, given the intrinsic potential for lost sensitivity, because culturing practices often vary by practitioner. In addition, whereas urinary isolates can often be correlated with signs and symptoms in the patient, sputum isolates, on the other hand, tend to have lesser clinical and epidemiologic value in the assessment of nosocomial pneumonia, particularly in the absence of other salient findings, such as new pulmonary infiltrates.


DEC 1, 1989 16:15 INFECTION CONTROL SURVEY REPORT BY LOCATION PAGE 1
MICRO From: NOV 1, 1989 To: NOV 30, 1989
Location
Patient SSN Date Spec

4H

DEMO,1 D1111 11/01/89 URINE Quantity: >100,000 — Infect. OR Coloniz.? C; Antibiotic Rx: Empiric N/A, Maint. N/A
PSEUDOMONAS AERUGINOSA 1) 3699

DEMO,2 D2222 11/10/89 URINE Quantity: >100,000 — I; TRM; CFT
PROTEUS MIRABILIS 1) 3700

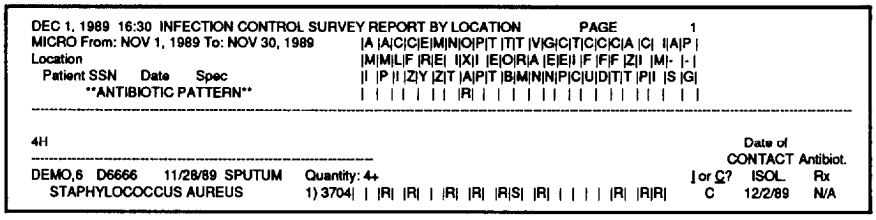
DEMO,3 D3333 11/18/89 URINE Quantity: >100,000 — I; TRM; TRM
KLEBSIELLA PNEUMONIAE 1) 3701

DEMO,4 D4444 11/23/89 URINE Quantity: >100,000 — I; TRM; CFD
PSEUDOMONAS AERUGINOSA 1) 3702

DEMO,5 D5555 11/30/89 URINE Quantity: >100,000 — C; TRM; N/A
PROTEUS MIRABILIS 1) 3703

NOSOCOMIAL UTI RATE FOR WARD 4H = 3 I per 1,000 patient-days in November = 0.3/100 patient-days

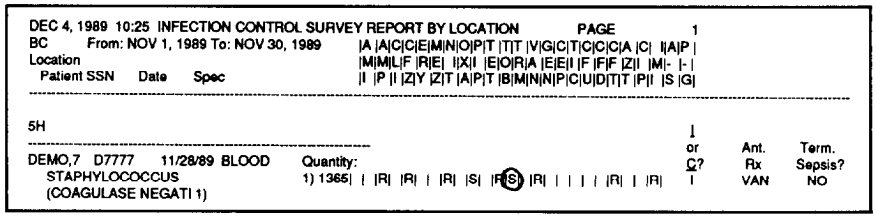
Figure 1.


DEC 1, 1989 16:30 INFECTION CONTROL SURVEY REPORT BY LOCATION PAGE 1
MICRO From: NOV 1, 1989 To: NOV 30, 1989
Location
Patient SSN Date Spec
ANTIBIOTIC PATTERN

4H

DEMO,6 D6666 11/28/89 SPUTUM Quantity: 4+ — I or C? C; Date of CONTACT ISOL. 12/2/89; Antibiot. Rx N/A
STAPHYLOCOCCUS AUREUS 1) 3704

Figure 2.


DEC 4, 1989 10:25 INFECTION CONTROL SURVEY REPORT BY LOCATION PAGE 1
BC From: NOV 1, 1989 To: NOV 30, 1989
Location
Patient SSN Date Spec

5H

DEMO,7 D7777 11/28/89 BLOOD Quantity: — I or C? I; Ant. Rx VAN; Term. Sepsis? NO
STAPHYLOCOCCUS (COAGULASE NEGATI 1) 1) 1365

Figure 3.

Furthermore, routine serologic surveillance may well be a future adjunct to help offset lost sensitivity from classic microbiologic surveillance. The emergence of organisms, such as *Clostridium difficile,* will likely influence the confirmation of both manual and automated/semi-automated reporting systems.

Referring to specificity, it is important to remember that individual line-item isolates need to reflect the proper ward of infection/colonization origin. The DHCP laboratory package enables one to exclude samples within a designated number of days since admission, in order to account for probable community acquisition of the microorganism. However, intrahospital transfers are not included in this feature. As a result, it is important to either custom program or manually adjust such transfers in order to not falsely assess isolates to particular wards. Our facility, for the sake of convenience, has exercised the latter option.

Although this system's admitted lack of optimal sensitivity may not allow the capture of all potential outbreak situations, it is always essential for the hospital epidemiologists to effectively complement both active and passive surveillance. Ford-Jones, et al.[3] recently described a powerful nursing sentinel sheet system that decentralizes the case-finding process. Other similar types of communication are strongly en-

couraged.

The semi-automated approach, while assuming the presence of a functional system for 'batching" individual isolates per ward per unit time (e.g., month), provides a hospital-wide, yet low labor-intensive method of conducting infection control surveillance. Although not as sensitive as the more traditional "gold standard" techniques of bedside observation, total chart review, etc., it can provide highly valuable trend data in facilities where scarce resources often do not permit such time-consuming data collection.

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More on Glutaraldehyde and Tuberculocidal Activity

To the Editor:

I must rebut several elements of William A. Rutala's, et al. response to Marian Kennedy's letter to the editor, both of which appeared in the July 1990 issue (1990;11:334-336).

The authors state that it was not necessary to indicate which 2% glutaraldehyde was used preceding the outbreak "because there is no evidence in the scientific literature that identifies differences in tuberculocidal activity when the disinfectants are used as recommended by the APIC draft guideline (i.e., 20 minutes at room temperature)."

This statement is at odds with the record. Surgikos scientists did the testing and developed the data for the Environmental Protection Agency-(EPA-approved labels requiring 45 minutes immersion for Cidex and 90 minutes for Cidex 7, both at 77°F, and requiring 86°F immersion temperature for the Cidex Automatic Machine Solution.

The Cidex need for heat to achieve tuberculocidal activity was recognized by Surgikos as far back as 1964. In a paper published in the October 1964 issue of the *Journal of Pharmaceutical Service,* Cidex scientists Borick, et al. stated that 30°C (86°F) was used to achieve tuberculocidal activity in ten minutes for Cidex. Also, the inability of test samples of the Cidexes to achieve tuberculocidal activity in ten or 20 minutes at 20°C was determined and reported by the EPA Microbiology Laboratory in December 1977 (EPA Enforcement Case Reviews, Nos. 136726 and 136727, December 8, 1977).

Furthermore, a number of research scientists have reported significant differences in activity among the 2% glutaraldehydes. In the May 1975 issue of ***Applied Microbiology,*** researchers at the Royal Veterinary and Agricultural University of Copenhagen reported that "the rate of inactivation (of coxsackievirus) was about ten times faster at pH 7.4 than at pH 5." Researchers at the Parkland Memorial Hospital, Dallas, Texas, published a paper in the March 1977 issue of ***Respiratory Care*** on efficacy and compatability differences they found between Cidex (alkaline) and Sonacide (acid), both 2% glutaraldehydes.

In October 1984, Dr. Ascenzi and other Surgikos scientists published a paper "Important Information Concerning the Reuse of Glutaraldehyde-Based Disinfectants and Their Tuberculocidal Activity," in which large differences in surviving organisms were shown among five brands of 2% glutaraldehyde (i.e., Cidex, Sonacide, Glutarex, Omnicide, Steril-Ize). Incidentally, the EPA, in a letter dated May 10, 1985, informed Surgikos that this paper contained misleading and inaccurate information and that it was inappropriate for Surgikos to disseminate these conclusions regarding tuberculocidal claims of others.

The authors also cite the "Draft Guideline for Selection and Use of Disinfectants" to suggest that the testing results in this guideline are more accurate than registered tuberculocidal label claims. These conclusions and data were challenged by the EPA in a letter dated January 24, 1989. The authors should be aware that, as stated on the product labels, "it is a violation of federal law to use this product in a manner inconsistent with its labeling."

The authors give as their reason for citing the draft Guideline the fact that it cited two papers suggesting that 20 minutes at room temperature is the minimum exposure time for tuberculocidal activity by 2% glataraldehyde. One of the papers is authored by Ascenzi and other employees of Surgikos, and is entitled, "A more accurate method for measurement of tuberculocidal activity of disinfectants." This "more accurate method" is a quantitative method that has never been corroborated by independent testing laboratories and, because of lack of corroboration, has never been accepted by the Association of Official Analytical Chemists (AOAC), the organization recognized by the government and industry as the source of validated and corroborated test methods. Furthermore, the paper contradicts the official findings of Surgikos as submitted to the EPA as label support. The other paper, by Collins, also used a quantitative method combined with the use of a filter membrane, which is uncorroborated and not generally accepted.

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