

infect the earpiece in stethoscopes assigned to individual patients, also.

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Safety Butterfly Needles for Blood Drawing

To the Editor:

Despite safety recommendations, the increased availability of personal protective equipment, and the implementation of improved disposal systems, high-risk needlestick injuries continue to occur in unacceptably high numbers in healthcare settings.¹

Design features of needle devices are relevant to their high injury risk. For example, butterfly-type devices with needle-shielding features to protect against needlestick injuries showed a 25% reduction in needlesticks in a clinical trial.² Any other risk-reducing design enhancements that can be incorporated into butterfly-type devices should be promoted and evaluated, particularly those intended for blood drawing, because of their disproportionate involvement in the transmission of bloodborne pathogens.

In a recent study on device-specific sharps injuries among healthcare workers, of all hollow-bore needles, conventional butterfly needles were associated with the highest injury rate per 100,000 devices used.³ This finding is consistent with the high rate of injury from butterfly-type needles documented in the Italian study on occupational risk of human immunodeficiency virus (HIV) that we reported previously.⁴

Since 1994, our data collection has been expanded to include all occupational exposures, regardless of source patient status, using the Exposure Prevention Information Network surveillance system.⁵ Of a total of 7,240 percutaneous injuries reported through December 31, 1996, 2,079 (29%) injuries were caused by butterfly-type needles. Our data show that more high-risk injuries (those involving blood-filled hollow-bore needles) are caused by butterfly-type needles

than by any other device.^{1,4}

Butterfly-type needles are notorious for producing the "cobra effect" against users when the spiral tubing recoils during disassembly and disposal. This is due to the length of the tubing and the fact that it is wound in a tight coil in its package. Although butterfly-type needles were designed primarily for intravenous therapy, they are used primarily for blood drawing. In the above-mentioned study, the highest use of butterfly-type needles was among laboratory phlebotomists. Similarly, in 569 (27%) butterfly-related needlesticks reported in the Italian Study on Occupational Risk of HIV—Exposure Prevention Information Network study, the device was used to draw blood, and 176 (31%) of these incidents occurred while putting the butterfly into a disposal container.

These data demonstrate that, in relation to current practice, butterfly-type devices frequently are used for blood drawing, a different procedure than that for which they were designed. We suggest that butterfly-type devices intended for blood drawing should have only a short length of tubing and that the tubing should not be packaged in coils. The effectiveness of these kinds of devices should be evaluated.

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Vancomycin Use and Monitoring in Pediatric Patients in a Community Hospital

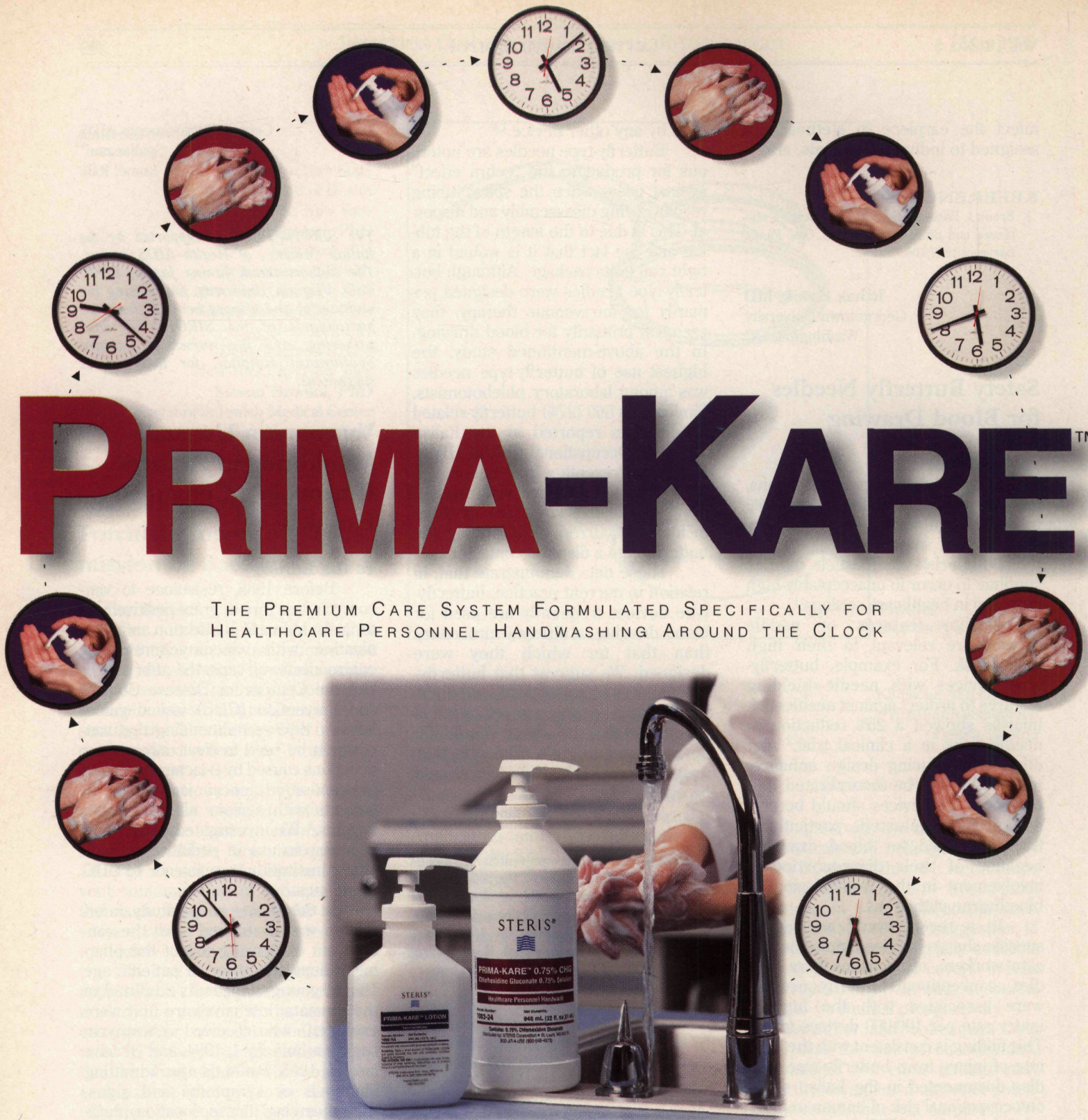
To the Editor:

Before 1988, resistance to vancomycin was rare in gram-positive bacteria. An increase in infection and colonization with vancomycin-resistant enterococci was reported after 1989,¹ and the Centers for Disease Control and Prevention (CDC) issued guidelines in 1995 recommending that vancomycin be used to treat only serious infections caused by β -lactam-resistant gram-positive cocci or used in patients with serious allergies to β -lactams.² We investigated patterns of vancomycin use in pediatric patients at our institution in reference to CDC guidelines.

In this retrospective study, information was abstracted from the vancomycin dispensing log of the pharmacy department on all patients age 18 and younger (patients admitted to the neonatal intensive-care unit were excluded) who received vancomycin between January 1, 1994, and December 31, 1995. Patient's age, admitting diagnosis or symptoms and signs, accompanying illness, location, duration of vancomycin therapy, other antibiotics used, number of serum vancomycin levels obtained, monitoring of blood urea nitrogen and creatinine, number of vancomycin dosages adjusted, development of any adverse reactions, and type, results, and susceptibilities of bacterial cultures were recorded.

During the study period, there were 6,239 admissions, of whom 80 (1.3%) received either parenteral (77

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TABLE

DURATION OF VANCOMYCIN ADMINISTRATION, NUMBER OF PATIENTS WHO RECEIVED OTHER ANTIBIOTIC(S) EITHER WITH OR FOLLOWING VANCOMYCIN ADMINISTRATION, ESTIMATED COSTS OF VANCOMYCIN ADMINISTRATION, AND SERUM DRUG MONITORING IN THREE CATEGORIES OF PATIENTS

	Patients Meeting CDC Guidelines	High-Risk Patients	Other Patients
No. of patients	22	28	30
Days of vancomycin administration, mean (range)	7.7 (1-28)	4.8 (1-28)	3.9 (1-12)
Patients given other antibiotics (%)	14 (53%)	28 (100%)	26 (87%)
Patients given other antibiotics after vancomycin was discontinued (%)	4 (18%)	9 (33%)	11 (37%)
Estimated cost of vancomycin and its administration	\$11,870	\$9,400	\$8,100
Estimated cost of serum drug monitoring	\$4,435	\$5,645	\$6,050

Abbreviation: CDC, Centers for Disease Control and Prevention.

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patients) or oral (3 patients) vancomycin. Of these 80 patients, 23 had a malignancy and a central venous access device, 3 had a ventriculo-peritoneal shunt, 7 had either congenital immune deficiency or serious immunological impairment because of immunosuppressive therapy, 19 were hospitalized for surgery or burn, and 28 could not be categorized in any of the above diagnostic groups.

Patients were classified into three treatment groups: group 1, 22 (28%) patients who met CDC guidelines for vancomycin use; group 2, 28 (35%) high-risk patients (febrile neutropenic oncology patients with central venous access device or patients with suspected ventriculo-peritoneal shunt infection) for whom vancomycin was prescribed empirically; and group 3, 30 (38%) patients who did not fulfill any of the above criteria. Patients who met the CDC guidelines for vancomycin use included those with bacteremia due to methicillin-resistant *Staphylococcus epidermidis* (MRSE)⁷ or methicillin-resistant *Staphylococcus aureus* (MRSA),⁵ suspected bacterial meningitis, severe allergy to penicillin with pneumatoceles on chest radiograph, and ampicillin-resistant *Streptococcus faecalis* infection. The duration of vancomycin administration, number of patients who received other antibiotics, estimated cost of vancomycin administration, and drug monitoring is given in the Table.

Thirty-five patients (44%) received vancomycin for less than 4 days, 38 (48%) for 4 to 10 days, and only 7 for greater than 10 days. The pharmacy

dosing service monitored vancomycin levels in all patients receiving parenteral vancomycin. The number of changes in the dosage of vancomycin ranged from 0 to 3, with a mean of 0.58 per patient. The average cost of drug level assays was \$202 per patient.

In this study, according to CDC guidelines, vancomycin was the appropriate drug in only 22 patients (28%). In 8 (36%) of the 22 patients, treatment with vancomycin was initiated only after culture results were available. Twenty-eight high-risk patients were prescribed vancomycin empirically, following prescribing practices that became common during the past 2 decades because of emergence of methicillin resistance in *S aureus* and *S epidermidis*. Vancomycin use in our hospital appears to be similar to the use patterns reported recently from other children's hospitals or pediatric centers.³ At our institution, the current incidence of MRSA is 31% and MRSE is 78%. Nevertheless, Pizzo and colleagues have shown that ceftazidime alone is adequate in many settings, because infections caused by *S epidermidis* often are not severe and do not progress rapidly.⁴

All patients receiving parenteral vancomycin also were monitored for serum drug concentrations. Recently there have been debates in the literature about the usefulness of therapeutic drug monitoring for vancomycin.⁵ The majority of patients in our study received vancomycin for a very brief period, and all had normal kidney functions. Therefore, drug level monitoring in many patients may not have been necessary. Continued educational efforts are necessary to familiarize

healthcare providers with the CDC guidelines regarding appropriate use of vancomycin treatment in all settings and appropriate guidelines for drug-level monitoring need to be established for pediatric patients.

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