Letters to the Editor

Hand Antisepsis: Evaluation of a Sprayer System for Alcohol Distribution

To the Editor:

Hand hygiene is still the single most important infection control measure for preventing nosocomial infections, and we welcome any new method or tool to increase compliance with it.

In the March issue of *Infection Control and Hospital Epidemiology*, Barrau et al.[1] reported the evaluation of an alcohol sprayer system for hand antisepsis. Some readers may have environmental and safety concerns regarding the type of gas used to vaporize the alcohol and local laws regarding aerosolized flammable fluids. Aside from these concerns and that the interpretation of the results presented in Table 2 would require knowledge of patient-days per stage of care necessity as well as information on how the investigators were able to assign alcohol use to one of the categories, we believe that the study methodology deserves further discussion.

Barrau et al.[1] compared a wall-mounted, hand-activated sprayer system with "bottles on a table," whereas dispensers are usually activated with clean elbows to avoid their contamination.[2] Furthermore, the study protocol[1] asked for hand cleansing before and after every visit to a patient's room, regardless of whether healthcare workers (HCWs) had had contact with the patient or the room environment or had previously washed their hands with soap and water. Compliance of HCWs with spray use was scored, disregarding hand washes or disinfection in the patient rooms. On the whole, the study setting seemed contradictory to state-of-the-art recommendations for the use of fast-acting alcohol-based hand rubs at the bedside,[2,3] which can bypass the time constraints associated with a high workload and thereby lead to better compliance.[4-6] New methods for increasing compliance with hand hygiene need to provide HCWs with not only the most effective products and application systems, but also rational indications for their use.

The results of this study[1] suggest a possible benefit of the sprayer system. Conclusions are entirely based on the estimated differences in the number of hand rinses per day derived from laboratory experimentation, which may not reflect actual practices on the wards. Were the amounts of alcohol used in the laboratory similar to those used on the wards? How is it possible that the actual amount of hand rub used (1.35 mL) was less than half of what was recommended? How much of the alcohol sprayed would end up on the hands? Furthermore, sprays may not adequately spread on the hands and thus may be less effective than a fluid, as evidenced by the results of a study on surface disinfection.[7] Would the significantly greater amount of alcohol poured from the individual bottle (1.35 mL per rinse) as compared with that obtained from the sprayer (0.79 mL per rinse) be associated with greater efficacy for bacterial hand antisepsis? The small amount obtained from a sprayer is likely to be insufficient to kill most bacteria on the hands.[8] Furthermore, before an alcohol-based spray is recommended for hand antisepsis, it should be considered that state-of-the-art hand disinfectants always include an emollient to care for the skin of HCWs; such an emollient had not been added.

We are surprised by the high rate of compliance by physicians (95% versus 28% for nurses) on entering a patient's room, which contrasts with that of previous studies. Observation bias could be an explanation, but, most importantly, the compliance level at the bedsides of patients was not accounted for and, as stated above, the opportunities for hand antisepsis were much different from those that have appeared in the literature or recommendations of guidelines.

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The authors reply.

We are pleased to reply to the comments of Drs. Voss, Widmer, and Pittet, who promote the use of alcohol in hand antisepsis.[1,2] Alcohol in a sprayer system is propelled with nitrogen, a gas that is known to be safe for the environment and not flammable. For physicians who practice evidence-based medicine, guidelines should be given with an appropriate grade of recommendation and level of evidence.

The recently published guideline for the use of alcohol hand antisepsis states that "If hands are not visibly soiled, use an alcohol-based hand rub for routinely decontaminating hands (IA). Alternatively, wash hands with an antimicrobial soap . . . (IB)."[3] Systematic disinfection before entering and leaving a patient's room complies with this guideline and, as recommended, might be a good educational means to improve hand washing, as noted by Voss et al.[1] In the same guideline, the technique recommended for hand disinfection is stated: "When decontaminating hands with an alcohol-based hand rub, apply product to palm of one hand and rub hands together, covering all surfaces of hands and fingers, until hands are dry (IB)."[3] No mention is made of time or of the quantity of alcohol to be used because too few data are given in the literature. The guideline concludes, "The efficacy of alcohol-based hand-hygiene products is affected by several factors, including the type of alcohol used, concentration of alcohol, contact time, volume of alcohol used, and whether the hands are wet when the alcohol is applied. The ideal volume of product to apply to the hands is not known and may vary for different formulations."[3]

Although the "Frequent use of alcohol-based formulations for hand antisepsis can cause drying of the skin unless emollients, humectants, or other skin-conditioning agents are added to the formulations,"[3] our study clearly shows that this is not true in our setting and that alcohol spray has had only a few adverse reactions. The only goal of this study was to demonstrate that a sprayer system may improve compliance with alcohol hand antisepsis. Since the publication of this study, more than 3,000 beds at the university hospital in Marseilles have been equipped with this sprayer. A study of the impact of this system on nosocomial infections is under way.

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Use of Glycopeptides at a French Teaching Hospital

To the Editor:

Since the emergence of methicillin-resistant *Staphylococcus aureus* (MRSA), glycopeptides have been the only uniformly effective treatment for staphylococcal infection. However, vancomycin exposure has been a risk factor for infection with vancomycin-resistant enterococci, and is associated with decreased susceptibility of *S. aureus* to vancomycin.[1,2] Prudent use of glycopeptides is essential to prevent further emergence of glycopeptide resistance in gram-positive bacteria. Using the guidelines issued by the Hospital Infection Control Practices Advisory Committee (HICPAC),[3] we attempted to determine the appropriateness of glycopeptide prescribing patterns at our institution. This study was conducted at a 1,560-bed university teaching hospital. Standard pharmacy protocol requires that all glycopeptide orders be rewritten every 5 days, and teicoplanin has been restricted so that the approval of an infectious disease physician is required. A prospective chart review was conducted, and 100 consecutive orders for oral and intravenous glycopeptides were screened for appropriateness of use and dose. Clinical and laboratory information was collected for each new course of glycopeptide treatment. Empiric therapy was defined as the administration of glycopeptides without a microbiological diagnosis at the time of ordering.

A total of 79 orders of vancomycin and 21 orders of teicoplanin were evaluated during the study period. Patients receiving a glycopeptide were predominantly male (67%), with ages ranging from 0 to 91 years. Forty-one glycopeptide orders originated from medical specialties, 32 from the intensive care unit, and 18 from surgical specialties; 9 were for outpatients. Nine orders were oral prescriptions. Glycopeptides were used empirically in 28 courses and prophylactically in 11 (vancomycin only). Sixty-one patients had a microbiological diagnosis. For 75 patients, use was for hospital-acquired infections. Five orders were for patients with gram-positive infections who had a history of beta-lactam allergy. The frequency of appropriate use was 71%: 53 (67%) of 79 for vancomycin and 18 (86%) of 21 for teicoplanin. Of the 29 courses that did not meet the recommendations, 19 were for continued empiric therapy for infections in critically patients whose cultures were negative for beta-lactam–resistant, gram-positive microorganisms (although 9 had nosocomial pneumonia in units where MRSA rates were high), 9 were for prophylactic use (oral decontamination of the digestive tract in hematology–oncology patients), and 1 was for infection due to a beta-lactam–susceptible, gram-positive microorganism. Inappropriate prescribing was more frequent when a glycopeptide was initiated for empiric therapy (19 [68%] of 28) than for documented infection (1 of 61). Incorrect doses were ordered in 11 of the 100 cases (9% for vancomycin and 5% for teicoplanin).

On the basis of Centers for Disease Control and Prevention guidelines, the rate of inappropriate use of glycopeptides was 29% and the rate of incorrect doses was 11%. Restrictive orders for teicoplanin may have helped optimize glycopeptide use. Studies suggest that, in the absence of restriction policies, only 20% to 40% of vancomycin use has conformed to HICPAC guidelines.[4-8] After a vancomycin control policy similar to the HICPAC recommendations was initiated, Roghmann et al. found inappropriate vancomycin use to be substantially lower (32%) than before restriction.[9] Our report concurs with another French study showing the rate of appropriate courses to be 66.7%.[10] Our rate of inappropriate use was lower than that in other studies; however, empiric and prophylactic use occurred less often in our study.