

roccocal infections. Approximately 50% of bloodstream isolates exhibited high-level gentamicin and streptomycin resistance, suggesting that synergistic therapy with an aminoglycoside and a cell-wall active agent is often not possible. These findings may have important implications for clinical outcomes, particularly in the setting of endovascular infections.

There were several potential limitations to our study. First, because we did not routinely identify enterococci to the species level, it is possible that our results may reflect the particular distribution of enterococcal species at our institution. Nevertheless, the implications of our findings for antimicrobial therapeutic options remain unchanged. Another potential limitation was the unavailability of isolates to permit molecular epidemiologic analysis. As such, we were unable to determine whether our results were due to the presence of multiple unrelated strains or the clonal dissemination of a few strains. Whereas such analysis would be important for understanding possible nosocomial spread of resistance, this study focused on potential therapeutic options for enterococcal infections. Finally, our study was conducted at a large academic medical center and our results may not reflect those at other dissimilar institutions.

We found significant decreases in susceptibilities for nearly all traditional anti-enterococcal agents, particularly among bloodstream and non-urine isolates. These results have important implications for the empiric and directed treatment of enterococcal infections and suggest that these infections will continue to present difficult therapeutic decisions.

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Improving Healthcare Workers' Compliance With Hand Hygiene: Is a Picture Worth a Thousand Words?

To the Editor:

The hands of healthcare workers are a major source for spread of nosocomial pathogens.¹ Several investigators have demonstrated that large numbers of pathogenic bacteria may be acquired on hands during routine patient care activities.^{2,4} For example, nurses caring for patients colonized with *Klebsiella* species frequently acquired hundreds of these organisms on their hands.² Even seemingly low-risk contacts, such as measuring blood pressure or touching environmental surfaces, have been shown to result in transmission of significant numbers of organisms to hands.^{2,6} Healthcare workers may not appreciate the extent of the contamination that occurs because microorganisms cannot be seen on their hands.

As a means to educate healthcare workers in our institution, we have

used hand cultures and molecular typing techniques to illustrate the spread of pathogens from patients and environmental surfaces to hands. One such illustration involved a 54-year-old man with vancomycin-resistant *Enterococcus faecium* stool colonization who was incontinent of feces, and quantitative cultures revealed that his stool contained more than 100 million vancomycin-resistant *E. faecium* per gram.⁶ Broth enrichment cultures from various surfaces in his hospital room were performed as previously described.^{6,7} A gloved hand imprint culture was obtained after briefly examining his abdomen (Fig. 1). The imprint culture was performed by placing the fingertips of the gloved hand onto Enterococcosel agar (Becton Dickinson, Cockeysville, MD) containing 6 µg/mL of vancomycin. A similar culture obtained after contact with his bed rail and bedside table yielded 9 colonies of vancomycin-resistant *E. faecium* (data not shown). Pulsed-field gel electrophoresis was performed as previously described.⁷ Multiple stool, environmental, and hand isolates were either genetically identical or closely related (Fig. 2). Cultures of sterile gloves obtained prior to contacting the patient or environmental surfaces were negative.

Convincing healthcare workers of the importance of hand hygiene remains an important challenge for infection control practitioners. Clear demonstrations of the hand contamination that occurs during routine patient care activities may be helpful as one component of an educational program. Healthcare workers from our institution have frequently expressed surprise that contamination of hands could be demonstrated after only minor contact with patients or environmental surfaces. In addition to distributing pictures illustrating hand contamination, we have used cultures of healthcare workers' hands with subsequent feedback regarding contaminating organisms as a means to provide personal examples and direct feedback. Others have recommended such culture exercises as a means to educate medical students and other personnel.^{8,9}

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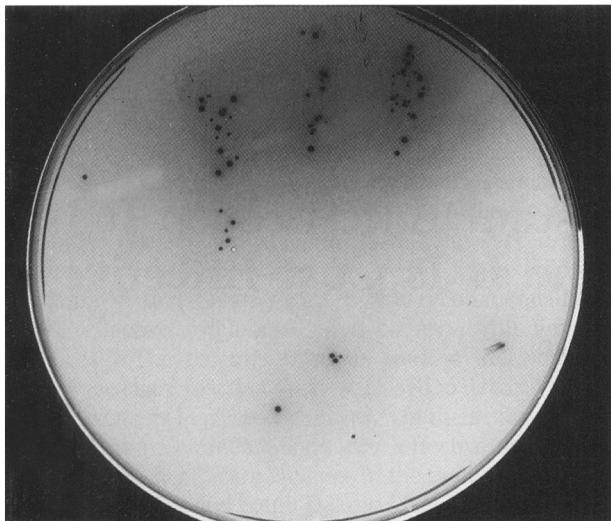


FIGURE 1. Gloved hand imprint culture demonstrating vancomycin-resistant *Enterococcus faecium* contamination after brief examination of the study patient's abdomen.

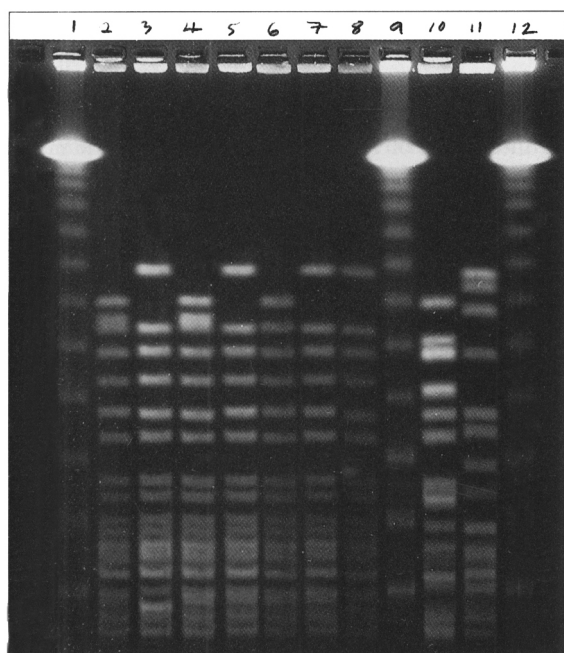


FIGURE 2. Results of pulsed-field gel electrophoresis for vancomycin-resistant *Enterococcus faecium* isolates associated with the study patient. Lanes 1, 9, and 12 show the molecular-size standards (lambda ladder); lanes 2, 3, and 4 show stool isolates; lanes 5 and 6 show bed rail isolates; lane 7 shows an isolate from a cardiac monitor; lane 8 shows a gloved hand imprint isolate; and lanes 10 and 11 show strains obtained from other patients.

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