Are We Doing Enough to Contain *Acinetobacter* Infections?

To the Editor:

Nosocomial infections caused by antibiotic-resistant strains of *Acinetobacter* are being reported with increasing frequency and are a major source of concern. Many strains have a high level of resistance to multiple antimicrobials and are associated with a high mortality rate, especially for pneumonia and bloodstream infections.[1] Risk factors associated with infection have been reported to include intubation, prolonged stay in the intensive care unit and hospital, prior use of broad-spectrum antibiotics,[2] mechanical ventilation,[3] prior surgery, and urinary catheterization.[4]

Intensive efforts have been applied to preventing or containing outbreaks caused by *Acinetobacter.* The Centers for Disease Control and Prevention (CDC) recommendations regarding control of multidrug-resistant gram-negative rods (including *Acinetobacter)* suggest that, in addition to Standard Precautions, Contact Precautions should be used for infected or colonized patients.[5] However, despite application of these recommendations, nosocomially acquired *Acinetobacter* remains problematic, resulting in substantial associated morbidity and mortality, higher treatment costs, and prolonged hospital stay.

It has been reported previously that *Acinetobacter* may be spread by the airborne route.[6,7] A recent report[8] supports this idea, based on observation that outbreaks of resistant *Acinetobacter* occurred in two facilities in which the index case was placed on Contact Precautions. Sedimentation plates yielded *Acinetobacter* both inside and outside of the infected patient's room. In contrast, no cross-transmission was observed in the facility where the index case was placed on Airborne Precautions.

We also have investigated the potential for multidrug-resistant *Acinetobacter* to spread by the droplet and airborne route in seven patients with respiratory tract infection or colonization.

Sedimentation plates were placed within a patient's room at measured intervals from the patient. The percentage of sedimentation plates with *Acinetobacter* colonies at various distances from the patient were: 1 ft, 42%; 3 ft, 28%; 5 ft, 75%; 7 ft, 60%; 9 ft, 57%; and 11 ft, 40% (maximum spatial separation achievable within the room). In several instances, *Acinetobacter* was also detected on sedimentation plates placed outside of the patient's room and as far away as the nursing station (approximately 22 ft from the room). Strains isolated from the patient's respiratory cultures and from sedimentation plates had the same antibiogram.

The detection of *Acinetobacter* in all areas within the rooms tested, and beyond, suggests a potential for airborne dissemination, as well as for droplet dissemination (which would be confined to a distance of approximately 3 ft from the patient).

Considering the continuing difficulty in controlling the spread of *Acinetobacter* throughout our healthcare facilities, these reports and findings, which suggest the potential for airborne transmission of *Acinetobacter,* are troubling, since current practice, based on CDC guidelines,[5] does not specifically address the potential for droplet or airborne transmission of *Acinetobacter.*

The potential for droplet and airborne transmission must be further evaluated with appropriately designed and controlled studies before any recommendation regarding the widespread use of these enhanced precautions can be considered. However, limited use of airborne precautions for pan-resistant strains of *Acinetobacter* infecting or colonizing the respiratory tract might be prudent for selected cases. This would especially pertain to patients with active cough or on mechanical ventilation requiring frequent suctioning.

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Epidemiology of Nosocomial Infections at Fukuoka University Hospital

To the Editor:

To investigate the epidemiology of nosocomial infections at Fukuoka University Hospital (850-bed), hospital-wide surveillance was conducted from June 1995 to March 1996. The emergency center, the neonatal intensive care unit, and all of the inpatient wards, except the psychiatry ward, were included.

Based on attending physician's reports, bacteriology reports, patient charts, and clinical ward rounds, nosocomial infections were determined by the infection control team (ICT) according to Centers for Disease Control and Prevention definitions.[1] The bacteriology reports were made and prepared by the ICT just on all methicillin-resistant *Staphylococcus aureus* (MRSA) isolates and isolates from blood cultures. The ICT used patient records to determine whether reported cases represented infection or colonization. Once weekly, the ICT made clinical ward rounds to each unit.

Nosocomial infection rates were calculated by dividing the number of nosocomial infections by the number

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of patient days during the term of surveillance.[2]

During the term of surveillance, 184 cases of nosocomial infections were identified (116 males and 68 females), 8,285 patients were discharged, and the total number of patient-days was 229,568. The overall nosocomial infection rates were 2.2/100 discharges and 0.80/1,000 patient-days. The rate of infections/100 discharges was highest in the digestive surgery ward (7.5), followed by the neonatal intensive care unit (6.2), the brain surgery ward (5.9), and hematology-gastroenterology ward (5.8), and the patient-day infection rate was highest in the digestive surgery ward (2.15/1,000 patient-days), followed by emergency center (1.68), the brain surgery ward (1.59), and the hematology-gastroenterology ward (1.45). The distribution by infection site is shown in the Table.

Overall, 190 pathogens were isolated or suspected as causative agents. These included 106 MRSA isolates (56%), 6 methicillin-sensitive *S aureus* isolates (3.2%), 5 *Staphylococcus epidermidis* isolates (2.6%), 8 *Enterococcus* species (4.2%), 5 *Pseudomonas aeruginosa* (2.6%), 8 *Enterobacter* species (4.2%), 4 *Serratia marcescens* isolates (2.1%), 3 *Klebsiella pneumoniae* isolates (1.5%), 2 *Citrobacter* (1.1%), 1 *Escherichia coli* (0.5%), 1 *Haemophilus influenzae* (0.5%), 7 fungi (3.7%), 13 adenovirus (6.8%), and 3 cases of scabies (1.6%).

Although the surveillance showed that MRSA was the major pathogen responsible for nosocomial infections at our hospital, our use of limited sources (ie, the bacteriology lists of MRSA isolates and the isolates from blood cultures) to identify the nosocomial infections in ward rounds might have caused a bias favoring the detection of MRSA infections. Consequently, we performed additional surveillance from April 1997 to March 1998, which showed a 51.3% incidence of MRSA among the causative pathogens of nosocomial infections.

This surveillance was performed based on the complete bacteriology report (the list of all isolates at our hospital) automatically prepared by the clinical laboratory computer. In addition, we carried out targeted surveillance from June 1998 to March 1999 according to the National Nosocomial Infection Surveillance System method.[3] Again, we found that MRSA isolates were the most prevalent type, both surgical-site infections (39.6%) and catheter-associated bloodstream infections (32.6%).

In conclusion, for the primary strategy of infection control, we believe that all the healthcare workers must take further steps to practice and master methods to care for their patients using both Standard Precautions and Contact Precautions[4] to contain MRSA, the major nosocomial pathogen in our hospital.

TABLE
OCCURRENCE OF NOSOCOMIAL INFECTIONS FROM JUNE 1995 TO MARCH 1996, FUKUOKA UNIVERSITY HOSPITAL

Type of Infection	NI	% of Total	Infection Rate*
BSI	42	(22.8)	2.8
SSI	29	(15.8)	1.9
Pneumonia	37	(20.1)	2.4
RTI	3	(1.6)	0.2
UTI	27	(14.7)	1.8
GI	22	(12)	1.4
Scabies	3	(1.6)	0.2
EKC	13	(7.1)	0.9
Meningitis	2	(1.1)	0.1
Skin infection	4	(2.2)	0.3
Arthritis	1	(0.5)	0.1
Otitis media	1	(0.5)	0.1
Total	184	(100)	2.2

Abbreviations: BSI, bloodstream infection; EKC, endemic keratoconjunctivitis; GI, gastrointestinal system infection; NI, nosocomial infection; RTI, respiratory tract infection; SSI, surgical-site infection; UTI, urinary tract infection.
* Nosocomial infection rate=number of nosocomial infections×100/total number of patients discharged.

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Outbreak of *Enterobacter cloacae* Related to Understaffing, Overcrowding, and Poor Hygiene Practices

To the Editor:

In their report about an *Enterobacter cloacae* outbreak in a neonatal intensive care unit (ICU), Harbarth et al discussed the influence of understaffing, overcrowding, and hand washing.[1] Harbarth et al included among their references the findings some years earlier of Haley et al,[2] who concluded, after an outbreak of staphylococcal infection in a neonatal special care unit, that overcrowding and understaffing in neonatal nurseries were significantly associated with cross-infection, because of the near impossibility of frequent hand washing between handling different infants.

That is why in the editorial the question was raised of whether "Too Many or Too Few Hands?"[3] that is, hand washing, or its lack, was really responsible for outbreaks of nosocomial diseases.

If medical personnel have to work in a situation of understaffing and overcrowding, do they really

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