

## Colonization With Multiresistant Bacteria and Quality of Life in Residents of Long-Term-Care Facilities

### To the Editor:

Little is known about the impact of multiresistant bacteria on the quality of life of residents in long-term-care facilities (LTCFs).<sup>1</sup> This may include the effects of the precautions themselves, such as being displaced from roommates, or the more subtle effects from the changes in behavior and the attitudes of nursing home staff, who may distance themselves from residents for fear of acquiring the multiresistant bacteria themselves. The benefit of such precautions to residents is uncertain. Cross-transmission and infection with multiresistant bacteria, such as methicillin-resistant *Staphylococcus aureus* (MRSA) or vancomycin-resistant enterococci (VRE), appear to be limited in LTCFs.<sup>2,4</sup> Since the risk posed by these bacteria to individual residents appears to be low, it is important to examine how the quality of life of residents identified as being colonized is affected. The detection of important changes in health-related quality of life, which denotes the functional, psychological, and social well being of LTCF residents, would argue strongly for a need to reevaluate current protocols.

To assess whether important differences in quality of life exist between residents of LTCFs who are colonized with multiresistant bacteria and those who are not colonized, we conducted a matched cross-sectional study. Residents from seven Ontario LTCFs (four community-based nursing homes, two chronic-care facilities, and two 30-bed long-term-care units in an acute-care hospital) who were identified as being colonized with MRSA or VRE for at least 2 weeks participated. Residents had been identified as colonized either on a previous admission to hospital or by a screening procedure prior to admission to the LTCF.

Each colonized resident was matched to one noncolonized resident residing on the same ward or unit by age (within 5 years), gender, and cognitive status, using the Reisberg Global Deterioration Scale (RGDS). For the

TABLE 1  
MATCHED ANALYSIS OF COGNITIVE PERFORMANCE SCALE

CPS Level* for Case Residents	CPS Level for Control Residents			
	0	1	2	3
0	1 <sup>†</sup>			
1	1	3 <sup>†</sup>		1
2	1	1	†	1
3		1	2	3 <sup>†</sup>

Abbreviations: CPS, Cognitive Performance Scale; CI<sub>95</sub>, 95% confidence interval.

\* CPS level ranges from independent to severe impairment where "0" represents independent; "1," mild impairment; "2," moderate impairment; and "3," severe impairment. Numbers represent pairs of case- and control-residents.

† The daggers represent similar cognitive performance levels. There are six pairs represented below the daggers, demonstrating cases to have higher scores (more impairment) than matched controls, and two pairs above, demonstrating lower impairment. The odds ratio is therefore 6/2 or 3 (CI<sub>95</sub> 0.65-10.4).

purpose of matching, colonized residents were matched within two points of non-colonized residents on the RGDS. Health-related quality of life was determined in both colonized and non-colonized residents using measurement instruments previously demonstrated to be valid and reliable in the long-term-care setting. A number of domains were assessed, including affect (Geriatric Depression Scale [GDS]), behavior (Dysfunctional Behavioural Rating Instrument [DBRI]), activities of daily living (ADL) Minimum Data Set (MDS ADL Hierarchy), and cognition (The Cognitive Performance Scale). The GDS was administered to residents by experienced geriatric research staff; scores range from 0 (no depression) to 30 (severe depression). The DBRI scored the frequency of 25 different behaviors and the burden each behavior placed on caregivers; higher scores denote greater burden. Scores were assigned by the nurse most familiar with the resident. The MDS ADL Hierarchy assigns scores for bed mobility, transferring, locomotion, eating, and toileting, based on selected items from the MDS. The Cognitive Performance Scale also was computed from MDS variables. To provide a global measure of residents' health-related quality of life, we used the MDS Health Status Index (HSI). Residents with severe dementia and no immediate family to serve as respondents, residents who were not English-speaking (or had severe dementia and no English-speaking family members), residents expected to die within 1 week, and residents with acute illnesses were excluded

from the study. Paired *t* tests were used to analyze differences in continuous quality-of-life measures (GDS, DBRI, MDS HSI). For categorical cognition and ADL scores, a matched analysis was performed.

Fourteen eligible individuals known to be colonized with MRSA and 1 known to be colonized with VRE were identified during the data collection period (November 1998-March 1999). The mean age of the case-residents was 82 (range, 69-93) years; 80% (12/15) were women. The median time from admission to colonization with multiresistant bacteria was 5.7 months (range, 0 days-6.7 years). The median duration of time when precautions were used was 57 days (range, 21 days-1.6 years). The mean difference in length of stay in the long-term-care unit among matched pairs of residents was 215 days in favor of noncolonized residents; this difference was not significant ( $P=.2$ ). Colonized residents had 1.1 more disease diagnoses than their matched pairs ( $P=.02$ ). Infection control precautions differed among colonized residents. Two of the 15 residents were in single rooms, whereas the rest were in multi-bed rooms. Infection control signs were posted on the door of all colonized residents. For 4 residents, the facility required that masks be worn when staff provided personal care. Seven of the 15 residents dined alone (because of being colonized); the other 8 dined with the other residents. For the 3 residents in chronic-care settings, gloves and gowns were required for staff and visitors entering the residents' rooms. For 10 resi-

**TABLE 2**  
MATCHED ANALYSIS OF HIERARCHICAL ADL SELF-PERFORMANCE

ADL Hierarchy Level* for Case Residents	ADL Hierarchy Level* for Control Residents			
	0	1	2	3
0	†			
1		1†		1
2		2	4†	2
3		2	2	1†

Abbreviations: ADL, activities of daily living; CI<sub>95</sub>, 95% confidence interval.

\* ADL Hierarchy levels range from independent to very dependent, where "0" represents independent; "1," assistance required; "2," dependent; and "3," very dependent. Numbers represent pairs of case- and control-residents.

† The daggers represent similar ADL Hierarchy levels. There are six pairs represented below the daggers, demonstrating cases to have higher ADL Hierarchy levels (more dependent) than matched controls, and three pairs above, demonstrating less dependency. The odds ratio is therefore 6/3 or 2 (CI<sub>95</sub>, 0.69-13.0).

dents, gloves had to be worn by staff providing personal care. For 2 residents in nursing home beds, gown and gloves were required for everyone entering their rooms.

Colonized residents scored a mean of 4.5 points more on the GDS (more depressed;  $P=.16$ ) and had a mean of 4.3 points more in dysfunctional behavior burden scores ( $P=.8$ ) than matched controls. Colonized individuals had lower MDS-HSI scores for all domains assessed and had a lower mean score (.10) than controls ( $P=.16$ ). Residents who were colonized had more cognitive impairment (odds ratio, 3.0; 95% confidence interval, 0.65-10.4) and were more likely to be dependent (odds ratio, 2.0; 95% confidence interval, 0.69-13.0) than controls (Tables 1 and 2, respectively).

Our findings demonstrate a trend towards more depressive symptoms, dysfunctional behavior, dependency in activities of daily living, and lower health-related quality of life in residents colonized with multiresistant bacteria compared to noncolonized residents. The small sample size of our study is a limitation. Also, colonized residents had more comorbid conditions than controls, which may have confounded the relation between colonization status and quality-of-life scores. The findings may not apply to residents with VRE, since only one resident was colonized with this organism. Based on these findings, a prospective study of the impact of multiresistant bacteria on the quality of life in residents of LTCFs is warranted.

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*This study was supported by a grant from the JP Bickell Foundation. The authors are grateful to the staff of the long-term-care facilities who participated in this study for their willing collaboration in this project.*

## Infection Control in Africa South of the Sahara

### To the Editor:

The translation of US-style infection control practices into healthcare provision in Africa, espe-

cially for the extremely poor African countries, is not an easy program to envisage. Procedures that are standard practices in the United States may be practically impossible to implement in most African countries. This letter discusses some of the universal problems associated with infection control in the African context. There are also problems due to ignorance, poverty, and the resulting lack of even the most basic resources for health care. Solutions to some of these problems are suggested.

Africa south of the Sahara consists of several developing countries, some of which are the "poorest among the poor" (in the words of Dr. Kurt Waldheim).<sup>1</sup> These very poor countries include Chad, Guinea, Mali, and Sudan. Some African countries like Angola and Mozambique have been in the process of recovering from several years of devastating civil war, while others like the Sudan and Congo are still being ravaged by civil strife. The resulting unstable governments accentuate poverty.

The quality of health care in Africa south of the Sahara varies considerably between countries (and even within the same country). In large cities such as Lagos, Nigeria, and Nairobi, Kenya, there are modern well-equipped hospitals, whereas in the rural areas clinics are few and some have very poor facilities. In isolated rural communities, there may be no clinics at all, and the people have to depend on herbalists, traditional healers, and quack doctors or travel long distances to the cities for medical care.

Surveillance data on nosocomial infection from the region are few. In African countries, the nosocomial infection rate might be higher than the 5% to 10% reported from North American and Western European countries,<sup>2</sup> due to the poor facilities available in most hospitals. In most countries the extent of the problem is unknown; most hospitals do not have designated staff for infection control, and surveillance is not done routinely. Even in the few reported cases, it is difficult to compare rates of nosocomial infection since case definitions vary and surveillance is usually inadequate.

In the relatively few institutions that have infection control nurses, the nurses may not have had special training; they often are working as part-