



## Medical Education and Research Grant Outcome Report

**Name:** Epidemiology of Antibiotic Resistance in Wisconsin Nursing Homes

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**Department:** Medicine – Infectious Diseases

**Program:** New Investigator Program

**Grant Duration:** 03-01-07 to 08-31-08 (18 months)

**Expenditures:** \$98,462 of \$100,000 (98% expended)

**Use of Funds (Taxonomy):** Clinical research

**Research Keywords:** Long-term care, antibiotic resistance, methicillin-resistant *Staphylococcus aureus*

► **Description:** Infections caused by antibiotic-resistant bacteria significantly increase patient morbidity and mortality. Most efforts to understand the epidemiology of antibiotic resistance are focused on hospitals; there is very little research on the dynamics of resistance in nursing home settings.

The long-term objectives are to understand the scope and patterns of antibiotic-resistant bacteria in nursing homes. Researchers focused on three aims, using a sample of nursing homes in central Wisconsin: (1) estimate the prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) and fluoroquinolone-resistant gram-negative bacilli (FQRGNB), (2) estimate the incidence of MRSA and FQRGNB, (3) estimate the variation in MRSA and FQRGNB cross-transmission.

► **Results:** Preliminary data show a surprisingly high prevalence: 53% of subjects were colonized with one or more antibiotic-resistant bacteria. Rates of MRSA colonization ranged from 12 to 38%; rates of FQRGNB ranged from 21 to 49%.

Preliminary analysis of data provides indirect evidence that cross-transmission is occurring in these nursing homes. Interestingly, subjects who had two or more roommates were three times as likely to be colonized with MRSA and/or FQRGNB. Data further indicated considerable clustering, suggesting a common source exposure for these subjects.

Data collection and analysis is still under way, but the data to date demonstrate that antibiotic-resistant bacteria are ubiquitous in nursing homes. Rather

than acting as passive reservoirs, nursing homes can play an active role in generating antibiotic resistance—through cross-transmission between residents.

These findings are an important step towards developing interventions for infection control in nursing homes. Investigators' future work will clarify the amount of cross-transmission in nursing homes and will begin to evaluate the mechanisms that facilitate cross-transmission.

► **Met Objectives:** Project completed

► **Timeline for Application of Results:** 3-5 years

► **New Partnerships or Collaborations:** Potential collaborations with Wisconsin Institute for Clinical and Translational Research (ICTR) and active collaborations with investigators at three other universities and VA facilities.

► **Matched Dollars (cash or in-kind):** \$253,913

► **Dissemination:**

- Published abstracts: Society for Healthcare Epidemiology of America
- Poster and presentation: 2008 American Geriatrics Society and 2009 ASP-T Franklin Williams Scholars Alumni meetings
- Article submitted for publication: *Journal of the American Geriatrics Society*

► **Additional Funding:** An RO1 application to the National Institute of Aging will be submitted in the fall, followed by a Merit grant application to the VA HSR&D in the early winter.