

Public release date: 20-Apr-2010

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Who is at risk for MRSA?

New study identifies, quantifies and characterizes its prevalence

PROVIDENCE, RI – A multi-center study led by a researcher at Rhode Island Hospital has determined that long-term elder care, HIV-infected and hemodialysis patients are at increased risk of carrying methicillin-resistant *Staphylococcus aureus* (MRSA) in their nose. The study also found that patients have vastly different quantities of MRSA in their noses, a potential indicator for their risk of developing an infection after surgery. The study appears in the June 2010 edition of the journal *Infection Control and Hospital Epidemiology* and appears online in advance of print.

In order to better understand the prevalence of MRSA in different patient populations, lead author Leonard Mermel, DO, ScM, worked with researchers at The Cleveland Clinic, Johns Hopkins Medical Institutions, Emory University and other organizations to obtain specimens from the noses of a variety of patients. Mermel is the medical director, department of epidemiology & infection control at Rhode Island Hospital.

In general, one in three individuals is colonized with *Staphylococcus aureus*, most often involving the nose. In the US, approximately 1 percent of people carry MRSA in their nose. Carrying MRSA in the nose increases the risk



 **IMAGE:** A multicenter study led by Leonard Mermel, D.O., of Rhode Island Hospital has determined that long-term elder care, HIV-infected and hemodialysis patients are at increased risk of carrying methicillin-resistant *Staphylococcus...*

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of developing an invasive MRSA infection such as bloodstream infection, pneumonia, surgical site infection, etc.

Staphylococcus aureus is the second most common pathogen causing health care-associated infections in the United States, and 49 percent of those infections are caused by the highly antibiotic-resistant bacteria MRSA. A strain called USA100 is the most common type of MRSA involved in health care-associated infections in U.S. hospitals.

In this study, 444 nose cultures of 2,055 patients from 13 enrollment centers resulted in growth of MRSA. The researchers found that 14 percent and 15 percent of inpatient and outpatient hemodialysis patients, respectively, carried nasal MRSA, as did 16% of HIV infected patients, and 20 percent of long-term elder care residents. Based on these findings, Mermel, who is also a professor of medicine at The Warren Alpert Medical School of Brown University and a physician with University Medicine, recommends, "Hospitals performing active surveillance for MRSA should consider such patient populations for screening cultures."

The researchers also found different strains of MRSA in different patient populations. For example, while USA100 was the most common MRSA strain detected, the USA 300 strain was much more commonly found in HIV-infected patients. The researchers also detected some MRSA strains not previously identified in the US, such as an MRSA clone common in Brazil.

Mermel and his colleagues also found dramatic diversity in the quantity of MRSA colonizing the noses of people. Some people had as few as 3 colonies of MRSA in their nose detected with a nasal swab whereas others had as many as 15 million colonies of MRSA. Mermel notes, "This finding is important because heavy MRSA colonization of the nose is an independent risk factor for the development of a surgical site infection."

Mermel says the study findings identify patient populations at increased risk for MRSA carriage and infection. Future studies can use this information to determine a biologic explanation for differences in strains and quantities of MRSA that some people carry in their noses.

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About Rhode Island Hospital: Founded in 1863, Rhode Island Hospital (www.rhodeislandhospital.org) in Providence, RI, is a private, not-for-profit hospital and is the largest teaching hospital of The Warren Alpert Medical School of Brown University. A major trauma center for southeastern New England, the hospital is dedicated to being on the cutting edge of medicine and research. Many of its physicians are recognized as leaders in their

respective fields of cancer, cardiology, diabetes, emergency medicine and trauma, neuroscience, orthopedics, pediatrics, radiation oncology and surgery. It has been recognized by Nursing Professionals magazine as one of its "Top 100 Hospitals to Work For." Rhode Island Hospital receives nearly \$50 million each year in external research funding. It is home to Hasbro Children's Hospital, the state's only facility dedicated to pediatric care, which is ranked among the top 30 children's hospitals in the country by Parents magazine. Rhode Island Hospital is a founding member of the Lifespan health system.

About University Medicine: University Medicine (www.umfmed.org) is a non-profit, multi-specialty medical group practice employing many of the full-time faculty of the department of medicine of the Alpert Medical School.
