

MRSA's Silent Threat: What happens at the beach doesn't always stay at the beach

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Staphylococcus aureus is a common commensal bacterium found colonizing humans, their pets and thriving in the environment. In addition to peaceful co-existence with humans, these bacteria are capable of causing numerous types of serious infections when given the opportunity. *S. aureus* are responsible for infections ranging from simple infections of the middle ear to those of the blood, bones and major organs. Adding to the challenges faced in treating staphylococcal infections; these organisms have acquired resistance to virtually all antibiotics used against them. Infections with *S. aureus*, and especially the multi-drug resistant MRSA, have become responsible for huge healthcare costs and are projected to be responsible for more deaths this year than HIV/Aids. The serious health threat posed by *S. aureus* is not limited to the hospitals or healthcare setting as acquired infections from community sources are emerging as a significant threat. In fact, infections by MRSA are now the most common cause of skin and soft tissue ailments in people who go to the nation's emergency rooms for care. As infections with these organisms increase, the search for all the sites or sources where they may survive and be shared among individuals is paramount. By determining the locations where the bacteria are harbored and the factors that may contribute to spreading these bacteria, plans can be devised to decrease the spread and therefore the risk. Our studies investigate a popular marine recreational beach as a potential reservoir for MRSA to be shared by those individuals using these waters. Our hypothesis is that the bathers using recreational waters not only contribute to the organisms in the water, and therefore serve as a source of pathogens, but might also become colonized or infected by the organisms that they are exposed to while in the water or on the beaches. In the first large epidemiology study investigating potential pathogens at a beach not impacted by sanitary sewage discharges, 1303 adult habitual bathers were randomly assigned to bather or non-bather groups, with subsequent follow-up for reported illness and environmental sampling of indicator organisms and potential pathogens. *S. aureus*, including MRSA, were isolated from the water associated with 37% (2.7% MRSA) of the bathers during recreational use. Additional studies using marine waters in small and large pool settings confirmed that bathers, both adults and young children in diapers, were a source of *S. aureus* and MRSA isolated from the study waters and sand samples. These findings support our hypothesis and demonstrate that human health risks occur in non-point source recreational marine beaches.

