

VIEWPOINT: Basic hygiene important in warding off staphylococcal infections

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I took up surfing and paddling when I came to Hawaii 10 years ago but soon heard rumors of staphylococcal infections from the ocean water, which piqued my interest as a physician and an infectious diseases specialist.

My curiosity led to published reports a decade before that found staphylococci in the water of Waikiki Beach. A grant from the University of Hawaii Sea Grant College allowed me to confirm the findings. We again found up to 100 staphylococci per 100 milliliters of water at Waikiki, although there were far greater numbers of other bacteria. When we tested other beaches, there were almost no staphylococci unless there were swimmers. We concluded the staphylococci were from people, not the ocean. This is consistent with the national studies indicating about one-third of normal people carry staphylococci in their nose without any symptoms. Molecular biology studies found the different strains of the staphylococci at Waikiki came from all over the world, as do the swimmers there.

The colony counts of staphylococci were much lower in the morning and evening when there were no bathers. We speculated this was due to the limited ability of staphylococci to survive in seawater, which is consistent with laboratory studies that suggest they do not live long in the ocean. Their survival depends on a variety of challenging environmental factors, including mineral content, temperature and sunlight. They are also outnumbered a million to one in seawater by a wide variety of bacteria that have adapted better to living in the sea and compete for survival but do not infect people.

We then tried to find evidence that the staphylococci in the seawater lead to infections. We were not able to find any evidence that staphylococcal infections occurred more frequently among paddlers, surfers or swimmers than in other sports such as football or wrestling. They all seemed to be related to wounds, which serve as the entry points and the nidus for infections - whether they come from football pads, mat burns or coral. We also cultured and surveyed university students and homeless people on Oahu for seawater use but could find no correlation. It would likely require a very large number of people to determine if there is a significant difference in infections between those who frequent the sea and those who do not.

When the concerns about staphylococci arose on Maui as to staphylococcus infections related to wastewater disposal, note was made of the Department of Health's routine testing for fecal organisms, which were consistently better than Centers for Disease Control and Present and Environmental Protection Agency standards. It is hard to know if there are high levels of staphylococci in Maui waters because of wastewater disposal as the assay methods are complex and laborious. Reports of wound infections among surfers need to be compared with rates among people who do not use the water. It may also be relevant that staphylococcus aureus strains rarely cause infections in fish or marine mammals and that they do not carry it as humans do.

So far, there does not seem to be credible evidence that staphylococci are causing an inordinate number of infections from the beach waters of Maui. To learn more about the risk, we need a better way to quantitate staphylococci in seawater and are developing molecular methods of detection with a grant from the Hawaii Impact Foundation. We have also recently done a survey of paddlers about infections to see if there is a difference among different areas of Maui water.

So what should we do about staphylococci until we know more? Basic hygiene is important in almost anything we do. Daily bathing and change of clothing help. Hand-washing helps. Prevent getting wounds or breaks in the skin. Do not share clothing, towels or equipment that others have used as one-third of people carry the bacteria. If you have a wound, keep it clean and let it dry. Topical antibiotic therapy may be of some help in preventing an infection but is usually not needed. If a real infection develops with fever, pain, swelling or redness, see a doctor.

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