

Super-Bacteria Are Becoming Resistant to Alcohol-based Disinfectants

A new Australian study has discovered that *Enterococcus faecium*, a bacteria already resistant to several drugs, has also evolved in response to the alcohol solutions used to disinfect in hospital settings. According to the study,

Alcohol-based disinfectants and particularly hand rubs are a key way to control hospital infections worldwide. Such disinfectants restrict transmission of pathogens, such as multidrug-resistant Staphylococcus aureus and Enterococcus faecium. Despite this success, health care infections caused by E. faecium are increasing. We tested alcohol tolerance of 139 hospital isolates of E. faecium obtained between 1997 and 2015 and found that E. faecium isolates after 2010 were 10-fold more tolerant to killing by alcohol than were older isolates."

Understanding Balance

Sanitation has been hailed as one way to combat antibiotic-resistant bacteria, particularly methicillin-resistant *Staphylococcus Aureus* (MRSA) and *Clostridium difficile* (C.diff). Sanitizers with at least 60 percent alcohol are recommended by both the World Health Organization (WHO) and the Centers for Disease Control (CDC). Both organizations cite alcohol-based disinfectants ability to annihilate bacteria. This leaves the microbiome like a blank slate, and like with any power vacuum, a new bacteria steps in to fill the void. In this case, it's *E. faecium*.

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Enterococci bacteria are behind some of the most commonly experienced infections, particularly UTIs, pelvic infections, and endocarditis. Most of the *E. faecium* strains that cause these infections originate in the gut, which isn't a surprise. Like another likely cause of infection, candida, *E. faecium* is found in 90% of human intestines. It isn't an inherently harmful bacteria. The problem occurs when the gut isn't able to balance out the microbes, and *E. faecium* takes over to the detriment of the entire system.

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Looking at It Right Side Up

This is the biggest problem with our understanding of microbes and antibiotics. We talk about how dangerous a bacteria is or how serious infections caused by that fungus are...but odds are good you have been living with those organisms all of your life without issue. What's changed?

The importance of your gut bacteria and properly balancing them cannot be overstated. By killing all of the bacteria, antibiotics allow the quickest ones to take over more easily. Antibiotics also destroy the hard work of building up your beneficial bacteria. Think of them like a helpful two-year-old. They want to do the right thing and help clean up, but you're left with an even bigger mess than you started with.

Sources:

- *Increasing tolerance of hospital Enterococcus faecium to handwash alcohols* – Science Translational Magazine
- *5 facts about Enterococcus faecalis* – BioCote
- *Hospital Superbugs are Evolving to Survive Hand*

Sanitizers – Ars Technic