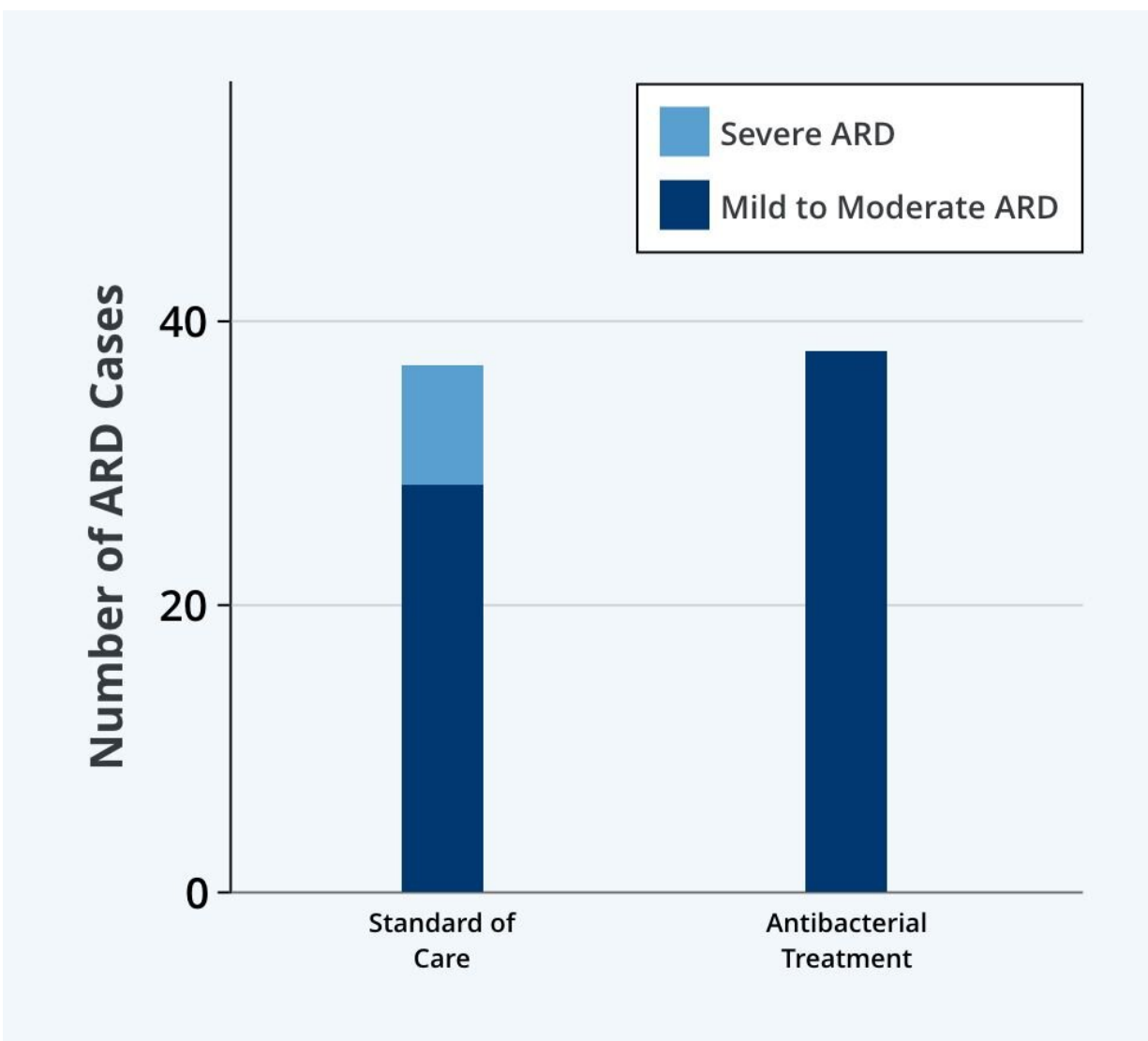


# A simple antibacterial treatment can solve a severe skin problem caused by radiation therapy

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A new study in *JAMA Oncology* found that a simple antibacterial treatment prevents severe cases of radiation dermatitis (ARD): No patients in the treatment group developed severe ARD, while severe ARD affected 23% of patients treated with the current standard of care. (Mild to moderate ARD = Grade 2-MD). Credit: Courtesy Albert Einstein College of Medicine

Acute radiation dermatitis (ARD)—characterized by red, sore, itchy or peeling skin—affects up to 95% of people undergoing radiation treatment for cancer. Severe cases can cause significant swelling and painful skin ulcers that can severely impair quality of life, yet little is known about why this condition occurs and no standardized treatments for preventing severe ARD have been widely adapted.

Researchers at Montefiore Einstein Cancer Center (MECC) have found that many cases of ARD involve a common [skin](#) bacterium and that a simple, low-cost treatment can prevent severe cases, potentially setting a new standard of care for people undergoing [radiation therapy](#). Their findings were reported in two papers published today (May 4) in *JAMA Oncology*. Each year, 10 million people are treated with [radiation](#) therapy to reduce the size of their tumors.

"Until now, ARD was assumed to result simply from the skin being burned by the radiation, which meant that not much could be done to prevent it," said Beth N. McLellan, M.D. director, supportive oncodermatology at Montefiore Einstein Cancer Center, chief of the division of dermatology at Montefiore Health System and Albert Einstein College of Medicine, and senior author of the two studies. "The readily available treatment we've developed and clinically tested could potentially save hundreds of thousands of people each year in the U.S. from severe ARD and its excruciating side effects."

## Identifying the source

Staphylococcus aureus (SA) bacteria, often shortened to "staph," typically live harmlessly on the skin, often in the nose and armpits. But they can cause infections if the skin is broken by a cut. Radiation weakens the skin's structure at the treatment site and can result in infection by allowing SA to break through the skin's outer layer. Courses of radiation therapy—routinely requiring daily treatments over several weeks—increase the risk for skin infection to occur.

Since SA is implicated in common skin disorders that lead to a breakdown in the skin such as eczema, Dr. McLellan and her colleagues reasoned that the bacteria might also play a role in ARD. In one of the *JAMA Oncology* studies, the MECC researchers enrolled 76 [patients](#) undergoing radiation therapy for cancer. Bacterial cultures were collected from patients before and after radiation treatment, from three different body sites: inside the nose, from skin in the radiated area, and from skin on the side of the body not exposed to radiation.

Before treatment, approximately 20% of patients tested positive for SA but did not have an active infection. Following treatment, 48% of those patients who developed severe ARD tested positive for the presence of SA, compared with only 17% of patients who developed the mildest form of the condition. Many patients with SA on their skin also tested positive for nasal SA, suggesting that SA from the nose might be infecting the skin.

"This study clearly showed that SA plays a major role in ARD," said Dr. McLellan. "The good news is we have a lot of tools to fight this bacteria. In a second study, we tested a topical antibacterial drug combination we thought would be effective and easy for people to use."

## Preventing Severe ARD

The second study enrolled 77 patients undergoing radiation therapy, all but two of whom had breast cancer. Participants were randomized to receive either the standard of care at MECC (normal hygiene and moisturizing treatment such as Aquaphor), or the experimental antibacterial regimen. This treatment involved using the body cleanser chlorhexidine along with mupirocin 2% nasal ointment twice a day for five days, every other week, throughout their [radiation treatment](#).

Although more than half the patients treated with the antibacterial regimen developed mild-to-moderate ARD, no patients developed moist desquamation—the most severe type of ARD that causes the skin to break down and develop sores—and no patients experienced adverse effects from the treatment. In contrast, severe ARD affected 23% of participants receiving the standard of care.

"Our regimen is simple, inexpensive, and easy so we believe it should be used for everyone undergoing radiation therapy, with no need to first test individuals for SA," said Dr. McLellan. "I expect this will completely change protocols for people undergoing radiation therapy for breast cancer."

Dr. McLellan also noted, "Like most of our trials at MECC, a majority of our participants were Black and Hispanic members of our community, meaning this protocol is generalizable and effective for people of different races and ethnicities. This is especially important because people with darker skin types are more likely to develop severe ARD."

**More information:** Staphylococcus aureus colonization predicts severity of acute radiation dermatitis" and "Bacterial decolonization for prevention of radiation dermatitis: a randomized clinical trial, *JAMA Oncology* (2023).

Provided by Albert Einstein College of Medicine

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