

# Antibiotic Use and Resistance in Dermatology

**A**ntibiotics play a significant role in the treatment of multiple dermatologic conditions, with a long history of proven efficacy and a well-known safety profile. However, there are also important downsides to their use and, particularly, their overuse. Antibiotic resistance has become a worldwide problem, and many published guidelines urge caution when prescribing antibiotics for an extended period of time.

In this conversation, two experts discuss the rationale behind antibiotic stewardship among practicing dermatologists and detail their approaches when utilizing these medications in clinical practice.

**James Del Rosso, DO:** One of the things that I've observed is there are different camps when we talk to our colleagues in dermatology regarding antibiotic resistance. There are those who are aware of it and try to treat their patients responsibly to the best of their ability, and then there are those who say, "I just don't see it," or "I don't believe that it makes a difference in my patients at these small doses."

Dr. Baldwin, what is your observation regarding your colleagues' opinion of antibiotic resistance?

**Hilary E. Baldwin, MD:** I equate the dermatology community's response to antibiotic resistance to the overall population's response to global warming. You have people who recognize that it exists and are doing the best that they possibly can to combat it. Then you have the folks who are nonbelievers and say that

they need more data. They aren't buying into the whole concept of antibiotic resistance.

At this point, I'm not sure what more data they need. I don't know how one "sees" antibiotic resistance, at least not visually. It's not as if the bacteria have a scarlet R on their chest. It's a real challenge for us to find a way to bring our community together so that every dermatologist has a healthy respect for the phenomenon of antibiotic resistance and is able to recognize the problem on a daily basis within their clinical practice.

**Dr. Del Rosso:** I see opinions changing, albeit slowly. Obviously, antibiotics are important. In some circumstances, they can be lifesaving. They don't pack quite that big a punch in dermatology, but we use them a lot to treat infections and inflammatory diseases such as acne and rosacea.

**Dr. Baldwin:** I think that the people who were on the fence four to five years ago about the impact of antibiotic resistance in dermatology have switched over to being believers, but I'm still worried about that group that doesn't "see resistance." I've had a hard time making headway with them.

**Dr. Del Rosso:** When I use an antibiotic in my patients with acne, it's typically one of the tetracycline derivatives such as doxycycline or minocycline. What I find important is to discuss your exit plan as soon as you write the initial antibiotic prescription with patients. That involves setting a timeline for the drug's use

and planning for its removal.

Is that something that you prioritize as well?

**Dr. Baldwin:** I agree that the development of an early antibiotic exit strategy is vital. We have to make sure that our patients recognize that although the antibiotics may serve as the heavy lifters initially to get their symptoms under control, we can't use them chronically to manage their condition.

What I tell my patients is that we are going to use an antibiotic for a maximum of two to three months, so they better get used to using topical agents as well from the very start. While there are times I will extend the use of the antibiotic beyond that three-month period, the whole point of that initial conversation is so that patients recognize the importance of topical agents as our long-lasting maintenance therapy.

What I always find interesting when I'm talking to a patient who has been prescribed an oral antibiotic as well as two topicals is that they'll tell me, "I just took the pills because the topicals weren't working." I ask them why they came to the conclusion that it was the antibiotic that was helpful and not the topicals, and they don't usually have a good answer.

**Dr. Del Rosso:** A significant proportion of our use of antibiotics in dermatology comes when we are treating acne and rosacea. I know a lot of us use oral antibiotics to kickstart therapy, but how do you decide when the antibiotics aren't working well enough and it's time to shift to something else, such as oral isotretinoin?

**Dr. Baldwin:** I consider myself to be an early transitioner away from antibiotics. If I'm convinced the patient is adherent to their regimen of the oral antibiotic and topical medications and they aren't improving, I'll often switch to oral isotretinoin after the first or second follow-up visit. In women, hormonal therapy is also an option. I don't find it useful to continue trying with an oral antibiotic for too long if it is clear that it is destined to fail.

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Johnson Medical Center in New Brunswick, NJ. Dr. Baldwin has lectured extensively both nationally and internationally and published prolifically in peer-reviewed journals. She also served as a founding board member and second president of the American Acne and Rosacea Society. Her areas of expertise include acne, rosacea, and keloid scars.

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**Dr. Del Rosso:** There was a paper in 2016 from New York University that reviewed patient records to look at the duration of systemic antibiotic use in patients with inflammatory/nodulocystic acne who eventually required isotretinoin. Some patients were treated by different clinicians for their acne over time. The study authors found that a significant percentage of these patients — 66.2% — had been treated with an oral antibiotic for at least six months and 33.6% of patients for longer than one year. A lot of patients were treated with antibiotics multiple times and at multiple centers during the period of the records review.<sup>1</sup> That study really hammered home how frequently some of our patients are exposed to oral antibiotics.

**Dr. Baldwin:** The study authors also pointed out how foolhardy we are when a patient comes to us who, for example, used doxycycline in the past that didn't work particularly well. Yet we'll try it again thinking that, because we wrote the prescription, it will magically work better the second time around instead of jumping right to oral isotretinoin. Logically, that makes no sense.

**Dr. Del Rosso:** When we're treating acne, antibiotics have a known effect in impacting the bacterium that we now call *Cutibacterium acnes*. But in rosacea patients, we aren't using antibiotics to treat any specific bacterium. Instead, their impact is limited to anti-inflammatory mechanisms. Consequently, will you use antibiotics differently in rosacea versus acne patients?

**Dr. Baldwin:** Absolutely. I almost never use full-dose antibiotics in my rosacea patients. For years, I would use doxycycline, but since the introduction of topical ivermectin, we now have a choice of agents that are equally efficacious. I use doxycycline and ivermectin both independently and in combination, but I will very rarely prescribe a full antibiotic dose of doxycycline.

**Dr. Del Rosso:** There are a lot of clinicians who have asked me if it's OK to start with a full antibiotic dose and then wean down to a subantibiotic dose. I caution against that. Typically, I'll start my rosacea patients on a 40-mg modified-release dose of doxycycline, which is a subantibiotic dose. I authored a paper back in 2007 showing that a subantibiotic dose of doxycycline is just as effective as the full 100-mg dose in reducing rosacea lesions and overall disease severity, with a reduction in adverse events at the lower dose.<sup>2</sup> Some clinicians simply assume that the higher dose of the antibiotic is going to give them a better effect, but that's not necessarily the case in rosacea patients.

Let's switch paths for a moment. I had a clinician say to me recently, "I get the idea that antibiotics cause resistance, but most of the antibiotic resistance is because of antibiotics in animal feed or use in industrial sources. In dermatology, we're such a small specialty, how can we possibly make a significant difference?" What do you tell people with that viewpoint?

**Dr. Baldwin:** Dermatologists make up approximately 1% of all physicians in the United States, but we prescribe more antibiotics per physician than any other medical specialty, so we're not as small a contributor as some people think.<sup>3</sup> As physicians, we have to recognize that what we do in every patient matters, and that, while every clinician is only a very small part of the problem, we are all nonetheless involved. Every patient I put on a full-dose antibiotic who develops resistance is now part of the global problem. I tell my patients that my primary goal is to make them better, but if I can make them better and save the planet at the same time, that's what I'm going to do.

**Dr. Del Rosso:** There are a lot of good data, mostly from Asia and Scandinavia, where they've changed prescribing patterns of different antibiotics and followed the resistance

patterns in specific communities. It takes a few years to demonstrate an effect, but the long-term results clearly show that reducing the frequency of antibiotic prescribing has an impact on overall levels of resistance.<sup>4,5</sup>

What about topical antibiotics? They can cause resistance as well, but we don't talk about them as much as oral antibiotics.

**Dr. Baldwin:** For years, both you and I have been harping on the importance of using benzoyl peroxide and never using an antibiotic as monotherapy in acne patients. I think it's starting to catch on. One of the problems with benzoyl peroxide is that patients complain about the way in which it bleaches fabric, and a lot of clinicians are loathe to prescribe it because they get so much pushback from their patients. I think we need to learn not to give in so easily because benzoyl peroxide works well in acne patients and can prevent or reverse the development of resistant bacteria.

**Dr. Del Rosso:** That's a great perspective with which to end our discussion. I hope we've been able to offer insight for the dermatology community today that will force clinicians to think about their current and prospective future use of antibiotics in their acne and rosacea patients.

#### References

1. Nagler AR, Milam EC, Orlow SJ. The use of oral antibiotics before isotretinoin therapy in patients with acne. *J Am Acad Dermatol.* 2016;74(2):273-279.
2. Del Rosso J, Schlessinger J, Werschler P. Comparison of anti-inflammatory dose doxycycline versus doxycycline 100 mg in the treatment of rosacea. *J Drugs Dermatol.* 2008;7:573-576.
3. Barbieri JS, Bhatte K, Hartnett KP, Fleming-Dutra KE, Margolis DJ. Trends in oral antibiotic prescription in dermatology, 2008 to 2016. *JAMA Dermatol.* 2019 Jan 16. [Epub ahead of print]
4. Mölstad S, Löfmark S, Carlin K, et al. Lessons learnt during 20 years of the Swedish strategic programme against antibiotic resistance. *Bull World Health Organ.* 2017;95(11):764-773.
5. Zellweger RM, Carrique-Mas J, Limmathurotsakul D, et al. A current perspective on antimicrobial resistance in Southeast Asia. *J Antimicrob Chemother.* 2017;72(11):2963-2972.