

Off-Label Spironolactone Use Rising as Antibiotic Use Declines for Acne Treatment in Women

Team A: Kersten Bartelt, RN; Alex Piff

Team B: Tony Dunnigan, MD; Joe Deckert, PhD

Last updated 23 May 2024 • Check for updates at EpicResearch.org

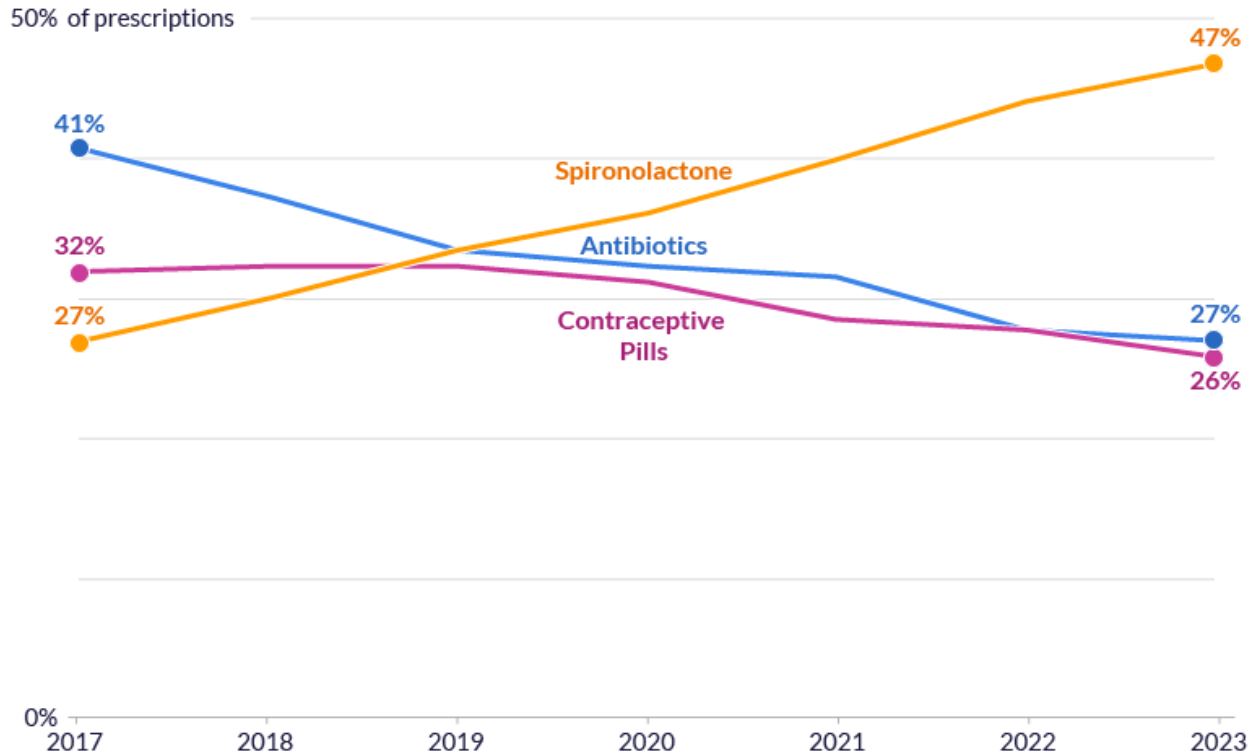
Key Findings:

- The use of oral antibiotics for acne treatment declined from 41% to 27% of prescriptions between 2017 and 2023, while the prescription of spironolactone for acne treatment increased from 27% to 47% of prescriptions in the same period.

There are many treatment options available for hormonal acne in women, including topical treatments and oral medications such as antibiotics, contraceptive pills, and off-label use of spironolactone.¹ However, with growing concerns surrounding antibiotic resistance, the prescription of oral antibiotics necessitates further review of risk-benefit analysis.² Additionally, there have been reports of spironolactone effectively treating acne.³ To understand how the prescribing of oral antibiotics and spironolactone for acne treatment has changed over time, we studied 972,439 prescriptions for oral antibiotics, oral contraceptives, or spironolactone placed during encounters with an acne diagnosis between 2017 and 2023.

We found that in 2017 and 2018, oral antibiotics were the most frequently prescribed acne treatment of those studied, accounting for more than one-third of prescriptions. However, this trend shifted in 2019 when spironolactone became the most commonly prescribed medication among the three groups. As of 2023, spironolactone constituted nearly half of the acne-related prescriptions studied.

Proportion of Oral Acne Treatment Prescriptions by Type Over Time



N=972,439 prescriptions

"Proportion of Oral Acne Treatment Prescriptions by Type Over Time," 2024. EpicResearch.org

Figure 1. The proportion of prescriptions for oral acne treatments by prescription type over time.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 246 million patient records from 1,400 hospitals and more than 32,500 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Mark LeBay.

References

1. Ludmann P. Acne: Diagnosis and treatment. American Academy of Dermatology. Published March 19, 2024. <https://www.aad.org/public/diseases/acne/derm-treat/treat>. Accessed April 24, 2024.
2. Baldwin H. Oral Antibiotic Treatment Options for Acne Vulgaris. J Clin Aesthet Dermatol. 2020 Sep;13(9):26-32. Epub 2020 Sep 1. PMID: 33133338; PMCID: PMC7577330.
3. Stubborn acne? Hormonal therapy may help. Aad.org. <https://www.aad.org/public/diseases/acne/derm-treat/hormonal-therapy>. Accessed May 3, 2024.

Data Definitions

Term	Definition
Study period	2017 to 2023
Study population	Female patients aged 18 to 40 who were prescribed an acne medication in an encounter with an acne diagnosis.

	Transgender patients were excluded from the study as spironolactone can be used for gender-affirming care and the use for acne was the focus of the study.
Acne medication	A prescription for spironolactone, oral contraceptive pills, or oral antibiotics.
Spironolactone	Medication with RxNorm code 9997
Oral contraceptive pills	Medications with a simple generic name containing “Estrad” and “Noreth,” “Norges,” “Noges,” “Drosp,” “Gesto,” or “Desoges.”
Oral antibiotics	Doxycycline - Medication with RxNorm code 3640 Azithromycin - Medication with RxNorm code 18631 Minocycline - Medication with RxNorm code 6980 Cephalexin - Medication with RxNorm code 2231
Acne	A diagnosis with ICD-10-CM code L70* (excluding L70.4) or L73.0
Transgender	The following gender identities: “Transgender Male / Female-to-Male” “Transgender Female / Male-to-Female”

Table 1: Proportion of Oral Acne Treatment Prescriptions by Type Over Time

Year	Total Orders	Spironolactone	Antibiotic	Oral Contraceptives
2017	97,691	27.3%	40.7%	32.0%
2018	113,959	30.3%	37.2%	32.5%
2019	125,862	33.7%	33.7%	32.5%
2020	137,383	36.2%	32.5%	31.3%
2021	162,967	39.8%	31.6%	28.6%
2022	167,810	44.1%	28.0%	28.0%
2023	166,767	46.8%	27.1%	26.1%