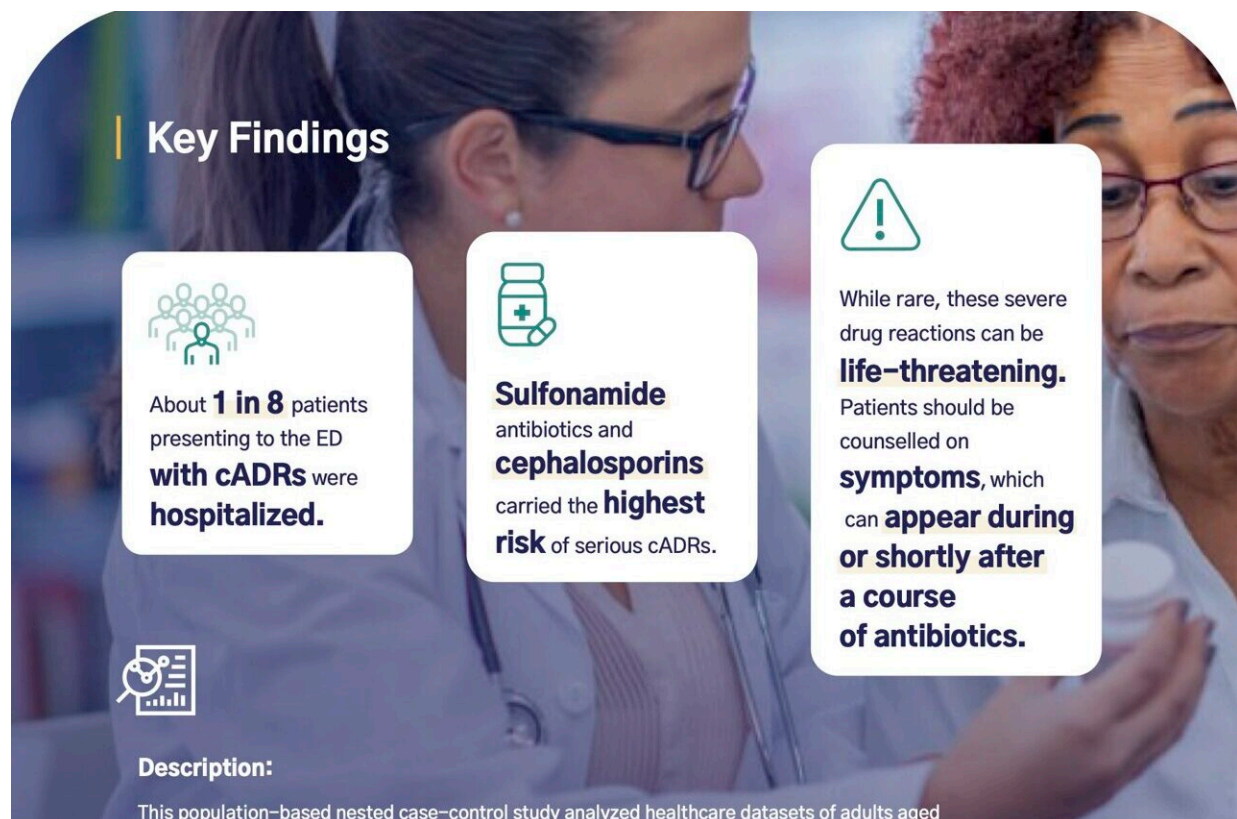




Common antibiotics carry small but serious risks of life-threatening drug reactions, but some are safer than others


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Key Findings

 About **1 in 8** patients presenting to the ED **with cADRs** were hospitalized.

 **Sulfonamide** antibiotics and **cephalosporins** carried the **highest risk** of serious cADRs.

 While rare, these severe drug reactions can be **life-threatening**. Patients should be counselled on **symptoms**, which can **appear during or shortly after a course of antibiotics**.

 **Description:**
This population-based nested case-control study analyzed healthcare datasets of adults aged

Common antibiotics carry serious risk of life-threatening drug reactions, but safer options exist. Credit: ICES

Two classes of commonly prescribed oral antibiotics are associated with

the greatest risk for severe drug rashes that can lead to emergency department visits, hospitalizations and even death, according to a new study.

Researchers from ICES, Sunnybrook Research Institute and the Department of Medicine at the University of Toronto's Temerty Faculty of Medicine suggest that prescribers should consider using lower-risk antibiotics for their patients when clinically appropriate.

Serious cutaneous adverse drug reactions (cADRs), or severe drug rash, are a group of rare but potentially life-threatening delayed reactions involving the skin and, often, internal organs. Some of these reactions carry mortality rates from 20 to 40%. While many different classes of drugs can cause serious cADRs, antibiotics are among the most commonly reported triggers for these reactions.

"Clinicians have speculated that certain antibiotics carry greater risk for these severe reactions, but no study has ever confirmed these claims," says Erika Lee, an allergist and a trainee with ICES and Temerty Medicine's Eliot Phillipson Clinician-Scientist Training Program. "Our objective was to explore the risk for cADRs in a population of older adults, who tend to receive disproportionately more antibiotic prescriptions than younger adults."

The study, "Oral antibiotics and the risk of serious cutaneous adverse drug reactions," was published in *JAMA*. The case-control study used health care data from ICES of adults 66 years or older who received a prescription for at least one oral antibiotic between 2002 and 2022 in Ontario, Canada.

Over the study period, 21,758 adults had an ED visit or hospitalization for a serious cADR following [oral antibiotics](#) and were matched with 87,025 controls who did not have a reaction.

Risk highest for two classes of antibiotics

"The good news is that most patients who visited the hospital with these reactions were discharged without being admitted, so that should be reassuring to providers and patients," says Lee. "However, of those who were admitted to hospital with the most severe reactions, 20% were treated in the ICU, and 5% of hospitalized patients died, which underscores the need for careful prescribing practices."

The most commonly prescribed antibiotics were penicillins (29%), followed by cephalosporins (18%), fluoroquinolones (17%), macrolides (15%) nitrofurantoin (9%) and sulfonamides (6%). Less commonly prescribed antibiotics were grouped together and accounted for 7% of prescriptions.

Key findings include:

- All antibiotics were associated with a higher risk of serious cADRs relative to macrolides, but sulfonamides ("sulfa drugs") and cephalosporins were associated with the highest risk.
- There were two cADR-related hospital visits for every 1,000 [antibiotic prescriptions](#) dispensed.
- About one in eight patients presenting to the ED with antibiotic-related cADRs were hospitalized, likely because their reactions were more severe or because of concerns about potential complications.
- 20% of hospitalized patients with the most severe forms of cADRs were treated in a critical care unit, and 5% of those patients died.

Greater awareness needed

"While rare, these severe drug reactions can be life-threatening. Patients should be aware of rash, fever, and other symptoms, which can start weeks after a prescription has been started and even after the course of antibiotics has stopped," says David Juurlink, a staff internist and head of the Division of Clinical Pharmacology and Toxicology at Sunnybrook Health Sciences Center, senior core scientist with ICES and professor of medicine with Temerty Medicine.

"It's also one more reason why antibiotics should be prescribed only when they're truly needed," he adds.

More information: Oral Antibiotics and Risk of Serious Cutaneous Adverse Drug Reactions, *JAMA* (2024). [DOI: 10.1001/jama.2024.11437](https://doi.org/10.1001/jama.2024.11437)

Provided by ICES

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