

For children with respiratory infections, antibiotics with narrower targets are better

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When doctors prescribe antibiotics for children with common respiratory infections, a more selective approach is better. Researchers who studied pediatric treatment practices in 30,000 patients with

earaches, strep throat and other common infections found that narrow-spectrum antibiotics, which act against a smaller range of bacteria, had fewer adverse effects than broad-spectrum antibiotics, which target a broader variety of bacteria.

When judged by both practical and [clinical outcomes](#), narrow-spectrum antibiotics performed equally well or better than broad-spectrum ones, with fewer disruptions to family routines.

The study reflects an "antimicrobial stewardship" approach, guiding healthcare providers to prescribe the most appropriate antibiotic for a patient's specific type of infection, with the aim of improving individual outcomes and reducing the overall risk of antibiotic resistance—in which disease-causing microorganisms develop resistance to commonly used antibiotics.

"Many children unnecessarily receive broad-spectrum antibiotics for common infections, which can lead to antibiotic resistance and unnecessary side effects," said study leader Jeffrey Gerber, MD, PhD, associate director for Inpatient Research Activities in the Center for Pediatric Clinical Effectiveness at Children's Hospital of Philadelphia (CHOP). "This study showed that inappropriate prescribing of antibiotics also affects families at a much more practical level, such as missed days from school and work, side effects of the drugs, and costs for extra childcare. These can be a real burden for families."

Gerber and colleagues published their study in the *Journal of the American Medical Association* on Dec. 19, 2017. An award from the Patient-Centered Outcomes Research Institute (PCORI) funded this study.

The study team performed two complementary studies in 31 primary care practices in CHOP's pediatric network in Pennsylvania and New

Jersey, between January 2015 and April 2016. They drew on electronic health records of infants and children up to age 12 diagnosed with an acute respiratory tract infection (ARTI) and prescribed an oral antibiotic. In a retrospective cohort of approximately 30,000 patients, 14 percent received broad-spectrum drugs and 86 percent received narrow-spectrum drugs.

The ARTIs in the analysis were acute otitis media (earache), Group A streptococcal pharyngitis (strep throat) and sinusitis (sinus infection). ARTIs account for the majority of antibiotic exposures in children. In addition to assessing clinical outcomes in a retrospective cohort of 30,000 children, the researchers studied a prospective cohort of 2,472 children, doing telephone interviews with caregivers to measure outcomes that parents had identified as their highest concerns: adverse drug effects, additional childcare costs, lingering symptoms and missed school days.

The study team found a significantly higher risk of adverse events for [broad-spectrum antibiotics](#) compared to narrow-spectrum antibiotics (3.7 percent vs. 2.7 percent as documented by clinicians, and 35.6 percent vs. 25.1 percent, as reported by patients and families). The rates of treatment failure were not significantly different between both types of [antibiotics](#).

CHOP's Center for Pediatric Clinical Effectiveness (CPCE) recently issued a [research brief and policy tip sheet](#) summarizing seven years of research to develop a clinical practice model for antibiotic stewardship in pediatric outpatient settings. "Research tells us that antibiotic stewardship programs not only reduce the overall burden of [antibiotic resistance](#), but also improve patient outcomes," said Gerber, who added, "Our previous research has also shown that these programs can lower costs for insurers and families that pay for prescriptions. These programs are a win-win-win for public health, families and insurers."

More information: Jeffrey S. Gerber et al, Association of Broad- vs Narrow-Spectrum Antibiotics With Treatment Failure, Adverse Events, and Quality of Life in Children With Acute Respiratory Tract Infections, *JAMA* (2017). [DOI: 10.1001/jama.2017.18715](https://doi.org/10.1001/jama.2017.18715)

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