

Study shows inappropriate antibiotic prescribing differs by patient age, insurance, race

January 30 2018

A patient's age and race are associated with risk of receiving an unneeded antibiotic prescription for upper respiratory conditions caused by viruses, according to a study published today in *Infection Control & Hospital Epidemiology*, the journal of the Society for Healthcare Epidemiology of America. Additionally, the study found that advanced practice providers, such as nurse practitioners and physician assistants, are 15 percent more likely than physician providers to prescribe antibiotics to adults.

"By undertaking this research, we can help ensure that our local patients receive the most appropriate, safe care, and are not inappropriately prescribed [antibiotics](#)," said Lisa Davidson, MD, an author of the study and medical director for the Antimicrobial Support Network at Carolinas HealthCare System. "These results also show that strategies to reduce inappropriate prescribing must be tailored for outpatient settings. At Carolinas HealthCare System, we've equipped our outpatient providers with scripts and educational materials to help guide conversations with patients about antibiotics. We've also given them checklists for over-the-counter medicines, which they can recommend to patients who have viral symptoms."

The researchers reviewed prescribing patterns of 281,315 adult and [pediatric patients](#) seen across 898 providers and 246 outpatient practices at Carolinas HealthCare System, based in Charlotte, North Carolina.

These patients were treated between January 1, 2014, and May 31, 2016, for four common conditions that do not routinely require antibiotics: viral [upper respiratory infection](#), bronchitis, sinusitis, and non-suppurative otitis (uninfected fluid in the middle ear).

Key findings of the study include:

- Acute bronchitis was the most common indication for which an antibiotic was potentially prescribed inappropriately.
- The risk of receiving an antibiotic at a visit was higher for [adult patients](#) aged 40-64. Prescribing rates declined for [adults](#) older than age 64.
- White adult and pediatric patients, as well as adult patients with commercial insurance, were more likely to receive inappropriate antibiotic treatment for these viral illnesses.
- After adjusting for patient and [practice](#) factors, advanced practice providers were 15 percent more likely to prescribe an antibiotic than physician providers for adult patients.
- The age of the providers was also significantly associated with higher levels of antibiotic prescriptions for these illnesses, increasing as providers aged, up to 61.
- Family medicine practices had the highest rate of prescribing, while pediatric practices had the lowest.
- Pediatric practices were 16 percent less likely to prescribe an antibiotic compared to urgent care practices.
- For adults seen in a metropolitan area, the risk of receiving an antibiotic was 36 percent greater than those seen in rural practices.

As a result of these findings, researchers recommended tailoring interventions to specific settings of care, provider types, and patient characteristics, which could be more effective in improving appropriate prescribing and ultimately reducing antibiotic resistance. Additionally,

they suggest that future national stewardship efforts should target education and antimicrobial stewardship interventions for advanced practice providers, as their role continues to grow. Detailed results indicate that patient and provider education, specifically on appropriate prescribing for bronchitis that includes guidance on correct use of azithromycin, may be particularly effective. To further reduce unnecessary prescribing, researchers cited a need for in-depth qualitative research to understand the interactions between [patients](#) and providers that may influence prescribing for viral illnesses.

"Understanding the factors that impact prescribing is critical to determining how to reduce the misuse of antibiotics," said Melanie Spencer, PhD, executive director of Carolinas HealthCare System's Center for Outcomes Research and Evaluation. "Our findings demonstrate that variation in prescribing patterns exists and is associated with several patient, practice, and provider characteristics."

Data for the study was pulled from [electronic health records](#) to analyze patient, provider, and practice factors. Patient factors included indication for the visit, age, race, gender, health of the patient, and the average number of visits per patient. Providers' prescribing patterns were reviewed by age and type of provider, such as advanced practice providers, and physicians holding a medical doctor or doctor of osteopathy degree. Practice characteristics included practice type, rural versus urban setting, and year of visit.

The authors note several study limitations, including the use of administrative billing data to identify visits (visit-level data from the electronic health records was used in the analysis) and the health system's geographic footprint in the Southeastern United States, which is well-documented to have the highest prescribing rates in the US.

More information: Monica L. Schmidt et al, Patient, Provider, and

Practice Characteristics Associated with Inappropriate Antimicrobial Prescribing in Ambulatory Practices, *Infection Control & Hospital Epidemiology* (2018). [DOI: 10.1017/ice.2017.263](https://doi.org/10.1017/ice.2017.263)

Provided by Society for Healthcare Epidemiology of America

Citation: Study shows inappropriate antibiotic prescribing differs by patient age, insurance, race (2018, January 30) retrieved 20 July 2023 from <https://medicalxpress.com/news/2018-01-inappropriate-antibiotic-differs-patient-age.html>

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