How to Prescribe Fewer Unnecessary Antibiotics: Talking Points That Work with Patients and Their Families

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▶ See related editorial on page 203.

Antibiotic resistance is one of the world's most pressing public health problems. Antibiotic-resistant infections account for an estimated 2 million illnesses and 23,000 deaths annually in the United States.[1] Antibiotic use is a major driver of resistance,[1] and most antibiotics are used in outpatient settings.[2] Nationally, population-based rates of antibiotic prescribing for children decreased from 2000 to 2010, but did not change among adults 18 to 64 years of age and increased for adults 65 years and older.[3] Additionally, broad-spectrum antibiotic prescribing increased for all age groups from 2000 to 2010,[3] and antibiotic prescribing for acute respiratory tract infections remained common in children and adults.[3,4] In 2011, U.S. clinicians prescribed 262.5 million outpatient courses of antibiotics; of these, family physicians prescribed one-fourth, more than any other subspecialty.[5] Thus, family physicians are critical partners in the effort to avoid antibiotic overuse.

Being a good antibiotic steward means protecting patients and the public from antibiotic resistance and adverse events by prescribing antibiotics only when needed, and prescribing the right drug at the right dosage for the right duration. Antibiotic use in childhood has been linked to increased risks of autoimmune diseases and obesity, which are likely mediated via disruptions in the microbiome.[6] Clinicians should carefully weigh the risks and benefits when prescribing these drugs. In focus groups, messages about the risks associated with antibiotic use resonated with parents, who stated that they want to be informed about possible adverse drug events.[7] However, adult patients seemed to be less concerned about the possibility of adverse drug events.[7]

Why do clinicians prescribe antibiotics inappropriately? They generally know—but do not always follow—established clinical guidelines for appropriate antibiotic use.[8] Clinicians cite patient pressure and customer satisfaction as major reasons for inappropriate antibiotic prescriptions.[8-10] Clinicians are more likely to prescribe antibiotics if they perceive that the parent wants them to, but studies have shown that they do not accurately predict parental expectations.[11] Studies suggest that parents are often seeking reassurance that their child's condition is not serious and want to know how to help relieve their child's symptoms, but the clinician perceives them as expecting antibiotics based on things that they say.[11,12] For example, clinicians are significantly more likely to think a parent wants antibiotics if the parent asks questions about the treatment plan (e.g., stating that over-the-counter treatment is not working, questioning whether the clinician thinks the child needs antibiotics), but parents are actually no more likely to do so if they expect to receive antibiotics.[12] Misunderstandings such as these are likely contributing to antibiotic overuse.

Although not all patients and families expect antibiotics, some do. In these cases, how can clinicians prescribe antibiotics appropriately and keep patients and families satisfied? Studies have shown that even if patients expect antibiotics, they are willing to forego them if clinicians explain why antibiotics are not needed, provide positive treatment recommendations, and suggest contingency plans[13,14] *(Table 1[13-18])*. Furthermore, labels are important: patients are less likely to expect antibiotics if they are told they have a "chest

Table 1. Tips on Counseling Patients About Antibiotics

Communication strategy	*Examples*
Explanation for why antibiotics are not needed	"This is a nasty cold, so antibiotics won't make you better faster." "The strep test is negative, meaning your sore throat is caused by a virus, and antibiotics won't help."[14] "You have a chest cold, and antibiotics won't help." *Tip for clinicians: Patients are less likely to expect antibiotics for "chest colds" than for "bronchitis."*[15] *Always combine explanations for why antibiotics are not needed with positive treatment recommendations. Patients are willing to hear that antibiotics are not needed if the message is combined with how to help them feel better.*[14]
Positive treatment recommendations	"Taking ibuprofen and drinking plenty of fluids will help you feel better." "Honey can actually soothe your child's cough and help her sleep better."[14]
Contingency plan	"If you are not better in three or four days, call or come back and we can reassess the need for antibiotics then." "If your child is still sick in a week or if he develops a fever, come back and see me."[13]
Delayed antibiotic prescriptions	"Your child has an ear infection that will likely clear up on its own. If the ear still hurts in two days or gets worse, call or come back and we will recheck the ears." "Your child has an ear infection that will likely clear up on its own. Just in case it doesn't, here is an antibiotic prescription. Fill this prescription in two days if the ear still hurts, or earlier if your child gets worse. Feel free to call me with any questions."[16-18] *Tip for clinicians: When using delayed prescriptions, write an expiration date on the prescription (e.g., five to 10 days in the future) so that the prescription can be filled only during the watchful waiting period and not a few months later.*[17]

Information from references 13 through 18.

cold" rather than "bronchitis."[15] In the Netherlands, communications training for family physicians led to reduced antibiotic prescriptions for acute respiratory infections in patients of all ages, and the effect of this training was sustained over 3.5 years.[19] This communications training focused on teaching the clinician to elicit the patient's baseline knowledge and expectations, discuss the benefits and harms of antibiotics, provide a contingency plan for the illness, and assess the patient's understanding at the end of the visit.[20]

Beyond effective communication, making a public commitment to prescribe antibiotics appropriately and using delayed antibiotic prescribing (i.e., watchful waiting) are evidence-based interventions *(Table 2)*.[16,18-21] One study found that displaying posters in examination rooms with the clinician's photograph, signature, and commitment to use antibiotics appropriately led to a 20% reduction in inappropriate prescribing for acute respiratory infections.[21] Delayed prescriptions can be used for patients with nonsevere infections that are likely to resolve spontaneously but may require antibiotics if they do not improve, such as otitis media or sinusitis. In delayed antibiotic prescribing, patients are given a prescription but instructed not to fill it unless symptoms do not improve or worsen within a certain time. Alternatively, the patient can return for an antibiotic prescription.

Appropriate antibiotic prescribing is a quality-of-care issue; all clinicians have the responsibility to provide the right treatments to their patients while minimizing harm. Effective communication, public commitments, and delayed antibiotic prescriptions are evidence-based tools that family physicians can institute in any office setting. With these interventions, we can continue to improve antibiotic prescribing for children and extend these improvements to patients of all ages.

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Table 2. Evidence-Based Interventions to Reduce Inappropriate Antibiotic Prescribing

Intervention	*Example*	*Results*
Delayed antibiotic prescriptions	Patients are given a prescription or instructed to return to get a prescription if they do not feel better in a specified time or if they feel substantially worse	62% of children with acute otitis media and delayed prescriptions did not fill them; 13% of children with acute otitis media and immediate prescriptions did not fill them.[18] 91% of adults with acute respiratory infections and immediate antibiotic prescriptions used antibiotics; 33% of patients with delayed antibiotic prescriptions did not use antibiotics; 23% of patients who were instructed to return to get a prescription used antibiotics; 12% of patients with no antibiotic prescriptions used antibiotics. Patient satisfaction was similar in all groups.[16]
Effective communication	Training on how to elicit the patient's baseline knowledge and expectations, discussing the benefits and harms of antibiotic use, providing a contingency plan, and assessing the patient's understanding[20]	Antibiotics were prescribed in 26% of visits for respiratory infections to family physicians who had communications training compared with 39% of visits to physicians in the control group.[19]
Public commitments to use antibiotics appropriately	Posters displayed in examination rooms with the clinician's photograph, signature, and commitment to use antibiotics appropriately	20% reduction in inappropriate antibiotic prescribing for adults with acute respiratory tract infections compared with control group.[21]

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Implementing AHRQ Effective Health Care Reviews

Helping Clinicians Make Better Treatment Choices

Interventions to Improve Antibiotic Prescribing for Uncomplicated Acute RTIs

Practice Pointers by AARON SAGUIL, MD, MPH, *Uniformed Services University of the Health Sciences, Bethesda, Maryland*

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The Agency for Healthcare Research and Quality (AHRQ) conducts the Effective Health Care Program as part of its mission to produce evidence to improve health care and to make sure the evidence is understood and used. A key clinical question based on the AHRQ Effective Health Care Program systematic review of the literature is presented, followed by an evidence-based answer based upon the review. AHRQ's summary is accompanied by an interpretation by an *AFP* author that will help guide clinicians in making treatment decisions. For the full review, clinician summary, and consumer summary, go to http://www.effectivehealthcare.ahrq.gov/antibiotics-RTI.

This series is coordinated by Kenny Lin, MD, MPH, Associate Deputy Editor for *AFP* Online.

CME This clinical content conforms to AAFP criteria for continuing medical education (CME). See CME Quiz Questions on page 868.

Author disclosure: No relevant financial affiliations.

Key Clinical Issue

What are the effectiveness and adverse consequences of strategies for reducing antibiotic use in adults and children with uncomplicated acute respiratory tract infections (RTIs)?

Evidence-Based Answer

Procalcitonin point-of-care testing reduces antibiotic prescribing in adults (Strength of recommendation [SOR]: A, based on consistent, good-quality patient-oriented evidence), but increases antibiotic prescribing and adverse consequences in children. (SOR: B, based on inconsistent or limited-quality patient-oriented evidence.) Rapid streptococcal antigen point-of-care testing, viral polymerase chain reaction testing (adults only), and C-reactive protein testing reduced antibiotic prescribing, but studies of adverse consequences were lacking. Delayed prescribing practices reduced antibiotic prescribing, but reduced patient satisfaction and increased symptom length. (SOR: A, based on consistent, good-quality patient-oriented evidence.) Electronic decision supports reduced antibiotic prescribing without affecting the risk of complications.

Practice Pointers

Antibiotic-resistant bacterial infections lead to approximately 23,000 deaths in the United States each year.[1] Inappropriate antibiotic prescribing is the leading cause of resistance and accounts for one-third of all antibiotic prescriptions each year.[2] Clinical, system-level, or educational interventions that reduce inappropriate prescribing *(eTables A and B)* have the potential to dramatically decrease deaths and slow the progression of resistant organisms.

This Agency for Healthcare Research and Quality review considered multiple approaches to antibiotic overprescribing. Although individual studies varied with respect to practice setting, the combination of interventions, and the selection of RTIs for which effectiveness was shown, point-of-care testing generally reduced overprescribing. The addition of rapid streptococcal antigen testing decreased overall antibiotic prescribing by 20% to 52% and decreased inappropriate prescribing by 33% over usual care. Procalcitonin testing reduced antibiotic prescribing in adults by 12% to 72%, but led to a 22% increase in antibiotic prescriptions in children. C-reactive protein testing also reduced prescribing by 1.9% to 33.5%, but was associated with increased hospitalizations at one month (1.1% of those triaged with C-reactive protein testing were hospitalized as opposed to 0.2% of those who received usual care).[1]

Delayed prescribing (e.g., providing a prescription and instructing the patient to delay filling it) reduced antibiotic use by 34% to 76%, but was associated with reduced patient satisfaction and increased persistence of moderate to severe symptoms. Electronic decision support tools produced more modest reductions in overall prescribing (5% to 9%) with no difference in complications, whereas educational interventions targeting physicians, patients, or parents showed some promise (4% to 28% decline in overall prescriptions based on a mix of modalities used), without changing the rate of complications.[1]

Multiple effective interventions exist to help physicians be good stewards of antibiotics. The Institute for Clinical Systems Improvement does not recommend antibiotics for RTIs that are suspected to be viral, and recommends

Clinical Bottom Line: Clinical and System-Level Interventions That Improve or Reduce Antibiotic Prescribing for Acute RTIs*

Outcome	*Absolute change*	*Relative effect/result*	*Number of studies*	*Strength of evidence*
Procalcitonin point-of-care testing vs. usual care				
Overall prescribing (adults only)	–12% to –72%	Greater reduction with procalcitonin testing Acute RTI: OR = 0.14 (95% CI, 0.09 to 0.22) Acute bronchitis: OR = 0.15 (95% CI, 0.10 to 0.23)	1 systematic review of 4 RCTs	●●○
Adverse consequences	—	No difference in number of days of limited activity, missed work, or continuing symptoms at 28 days for upper or lower RTI in primary care	1 RCT	●○○
	—	No difference in hospitalizations or combined adverse effects/lack of efficacy outcome	1 RCT	
	—	No difference in mortality or treatment failure at 30 days for acute bronchitis/upper RTIs in primary care or emergency department care and for upper or lower RTIs in primary care	5 RCTs	
Rapid streptococcal antigen point-of-care testing vs. usual care				
Overall prescribing	–20% to –52%	Greater reduction with rapid streptococcal antigen testing	3 RCTs	●●○
Inappropriate prescribing	–33%	Greater reduction with rapid streptococcal antigen testing	1 RCT	●○○
Adverse consequences	—	No evidence regarding adverse consequences	—	○○○
Rapid viral point-of-care testing (multiviral polymerase chain reaction) vs. usual care in adults				
Overall prescribing	–7.8%; $P < .01$	Greater reduction with multiviral polymerase chain reaction	1 RCT	●○○
Adverse consequences	—	No evidence regarding adverse consequences	—	○○○
C-reactive protein point-of-care testing vs. usual care				
Overall prescribing	–1.9% to –33.5%	Greater reduction with C-reactive protein testing: RR = 0.73 (95% CI, 0.60 to 0.90)	7 RCTs	●●○
Adverse consequences	—	Greater reconsultation rate within 4 weeks with C-reactive protein testing	3 RCTs	●●○
	—	Potential increased risk of hospitalization at 30 days with C-reactive protein testing	7 RCTs	●○○
	—	No effect on symptom resolution	4 RCTs	●○○
Delayed vs. immediate prescribing				
Overall prescribing	–34% to –76%	Greater reduction with delayed prescribing: OR = 0.00 to 0.12	6 RCTs	●●○
Other benefits	—	Reduced multidrug resistance for streptococcal pneumonia strains in acute otitis media with delayed prescribing	1 RCT	●○○
	—	Reduced diarrhea in acute otitis media with delayed prescribing	2 RCTs	●○○
Adverse consequences	—	No difference in reconsultation	4 RCTs	●●○
	—	Reduced satisfaction with delayed prescribing	5 RCTs	●●○
	—	Increased persistence of moderate to severe symptoms with delayed prescribing	2 RCTs	●○○

continues

CI = confidence interval; OR = odds ratio; RCT = randomized controlled trial; RR = relative risk; RTI = respiratory tract infection.

**—All populations are adults and children with acute RTIs unless otherwise specified.*

reserving antibiotics for acute sinusitis when decongestants are ineffective or patients have complications.[3] The American Academy of Pediatrics suggests observation, rather than immediate antibiotic prescription, as an option in children 24 months or older with nonsevere acute otitis media (mild otalgia for less than 48 hours and a temperature less than 102.2°F [39°C]).[4] Despite this, the longer physicians are in practice, the less likely they are to follow the guidelines.[5] Many physicians feel that patient expectations and time constraints make it difficult to explain to a patient why they do not need an antibiotic.[6,7] Of the point-of-care modalities tested, rapid streptococcal antigen testing seems the most helpful in guiding antibiotic prescribing and is recommended by the Infectious

Clinical Bottom Line: Clinical and System-Level Interventions That Improve or Reduce Antibiotic Prescribing for Acute RTIs* *(continued)*

Outcome	*Absolute change*	*Relative effect/result*	*Number of studies*	*Strength of evidence*
Electronic decision support vs. usual care				
Overall prescribing (systems with ≥ 50% use)	–5% to –9%	Greater reduction with decision support: RR = 0.73 (95% CI, 0.58 to 0.92)	2 RCTs	●●○
Inappropriate prescribing (for acute bronchitis and acute otitis media)	–3% to –24%	Greater reduction with decision support	2 RCTs	●●○
Adverse consequences	—	No difference in health care utilization or complications	1 RCT	●○○

Strength of evidence scale

High: ●●● There are consistent results from good-quality studies. Further research is very unlikely to change the conclusions.

Moderate: ●●○ Findings are supported, but further research could change the conclusions.

Low: ●○○ There are very few studies, or existing studies are flawed.

Insufficient: ○○○ Research is either unavailable or does not permit estimation of a treatment effect.

CI = confidence interval; OR = odds ratio; RCT = randomized controlled trial; RR = relative risk; RTI = respiratory tract infection.

**—All populations are adults and children with acute RTIs unless otherwise specified.*

Adapted from the Agency for Healthcare Research and Quality, Effective Health Care Program. Improving antibiotic prescribing for uncomplicated acute respiratory tract infections. Clinician research summary. Rockville, Md.: Agency for Healthcare Research and Quality; January 2016. https://www.effectivehealthcare.ahrq.gov/ehc/products/561/2112/antibiotics-respiratory-infection-report-160128.pdf. Accessed June 27, 2016.

Diseases Society of America.[8] There may be a role for procalcitonin and C-reactive protein testing, but major clinical practice guidelines do not endorse their routine use.[9-11]

EDITOR'S NOTE: *American Family Physician* SOR ratings are different from the AHRQ Strength of Evidence (SOE) ratings.

The opinions and assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the U.S. Army Medical Department or the U.S. Army Service at large.

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eTable A. Categories of Interventions to Reduce Antibiotic Prescribing

Category	*Explanations and examples*
Clinical	Point-of-care tests to rapidly determine the likelihood that a patient has a specific infection (e.g., rapid streptococcal antigen test of a throat swab sample, multiviral polymerase chain reaction, or an influenza-specific test of throat or nasopharyngeal secretions) or has a bacterial infection instead of a viral one (e.g., blood procalcitonin, blood C-reactive protein); tympanometry to aid in diagnosing acute otitis media; delayed antibiotic prescribing (e.g., giving prescriptions to patients with instructions to delay filling, leaving prescriptions for patient collection, postdating prescriptions, requesting recontact with physician); clinical scoring tools based on combinations of signs and symptoms
System-level	Electronic decision support (computer-aided, evidence-based prescribing recommendations); paper-based physician reminders about prescribing; physician audit plus feedback; financial or regulatory incentives for physicians or patients; antimicrobial stewardship programs
Educational	Clinic-based patient or parent education about when antibiotics may be appropriate (e.g., videos, pamphlets, verbal education, waiting room posters); public education campaigns (e.g., billboards, bus advertisements, radio and television advertisements); clinician education about current treatment guidelines; communication skills training programs for physicians
Multifaceted	Combination of interventions from one or more categories

Adapted from the Agency for Healthcare Research and Quality, Effective Health Care Program. Improving antibiotic prescribing for uncomplicated acute respiratory tract infections. Clinician research summary. Rockville, Md.: Agency for Healthcare Research and Quality; January 2016. https://www.effectivehealthcare.ahrq.gov/ehc/products/561/2112/antibiotics-respiratory-infection-report-160128.pdf. Accessed June 27, 2016.

eTable B. Educational Interventions That Improve or Reduce Antibiotic Prescribing for Acute RTI*

Outcome	*Absolute change*	*Relative effect/result*	*Number of studies*	*Strength of evidence*
Combined patient-parent public education campaign and physician education vs. usual care				
Overall prescribing	–7.3% (95% CI, –4.0% to –10.6%)	Greater reduction with the combination intervention: OR = 0.56 (95% CI, 0.36 to 0.87) to 0.62 (95% CI, 0.54 to 0.75)	5 RCTs	●●○
Inappropriate prescribing				
Children with pharyngitis	–10.4%	Greater reduction with the combination intervention: OR = 0.62 (95% CI, 0.54 to 0.75)	2 RCTs	●○○
Adults with acute RTIs	–9.7%	Greater reduction with the combination intervention		
Adverse consequences	—	No difference in acute otitis media complications	1 observational study	●○○
	—	No difference in patient or parent satisfaction	2 RCTs	●○○
Clinic-based education of parents of children aged ≤ 14 years vs. usual care				
Overall prescribing	–21.3% (1 RCT)	Greater reduction with clinic-based parent education: pooled OR = 0.39 (95% CI, 0.26 to 0.58)	2 RCTs	●●○
Adverse consequences	—	No difference in return visits	2 RCTs	●○○
Public education campaigns for parents vs. usual care				
Overall prescribing (children only)	Not reported	Greater reduction with public education campaigns Upper RTI: OR = 0.75 (95% CI, 0.69 to 0.81) Acute otitis media: OR = 0.65 (95% CI, 0.59 to 0.72) Pharyngitis: OR = 0.93 (95% CI, 0.89 to 0.97)	2 observational studies	●○○
Adverse consequences	—	No difference in the diagnosis of complications; subsequent visits were decreased with campaigns	1 observational study	●○○
Communication training for physicians vs. usual care				
Overall prescribing	–9.2% to –26.1%	Greater reduction with communication training: RR = 0.17 to 0.69	5 RCTs	●●○
Adverse consequences	—	Slightly longer duration of symptoms with communication training	3 RCTs	●○○
Physician and patient education, practice profiling, and academic detailing vs. usual care				
Overall prescribing	Acute bronchitis: –24% to –26%	Greater reduction with the combination intervention	3 observational studies	●○○
Adverse consequences	—	Insufficient evidence regarding return clinic visits	1 observational study	○○○
Provider communication training plus C-reactive protein point-of-care testing vs. usual care				
Overall prescribing	–28%	Greater reduction with the combination intervention: OR = 0.30 (95% CI, 0.26 to 0.36)	2 RCTs	●●○
Adverse consequences	—	Increased days of moderately severe symptoms with the combination intervention	1 RCT	●○○
	—	Potentially increased risk of hospital admissions with the combination intervention	2 RCTs	●○○
	—	No difference in reconsultation, diagnostic testing use, or days off work	1 RCT	●○○

Strength of evidence scale

High: ●●● There are consistent results from good-quality studies. Further research is very unlikely to change the conclusions.

Moderate: ●●○ Findings are supported, but further research could change the conclusions.

Low: ●○○ There are very few studies, or existing studies are flawed.

Insufficient: ○○○ Research is either unavailable or does not permit estimation of a treatment effect.

CI = confidence interval; OR = odds ratio; RCT = randomized controlled trial; RR = relative risk; RTI = respiratory tract infection.

**— All populations are adults and children with acute respiratory tract infections unless otherwise specified.*

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Author disclosure: No relevant financial affiliations.

Extended-Release Bupropion for Preventing Seasonal Affective Disorder in Adults

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Clinical Question

Is extended-release bupropion (Wellbutrin XL) more effective than placebo for preventing symptoms of seasonal affective disorder (SAD) in adults?

Evidence-Based Answer

When started in the fall, extended-release bupropion, 300 mg once daily, is effective in preventing recurrent symptoms in high-risk adults with a history of SAD (number needed to treat [NNT] = 5), as well as those at lower risk (NNT = 8). Headaches, nausea, and insomnia may limit adherence to treatment.[1] (Strength of Recommendation: B, based on inconsistent or limited-quality patient-oriented evidence.)

Practice Pointers

SAD is a recurrent depressive disorder that occurs only during a particular season, typically the winter months.[2] SAD is more common at northern latitudes; the prevalence is estimated at 9% in the northern United States,[3] and two-thirds of patients experience the symptoms every year.[4] Preventive measures are of particular interest for this group of patients.

The authors of this Cochrane review sought studies that compared any second-generation antidepressant with placebo, other medications, or other therapies for the prevention of episodes of SAD.[1] They found only three randomized trials, each comparing extended-release bupropion with placebo. The studies enrolled a total of 1,100 patients with a history of SAD at 151 sites in Canada and the northern United States. Patients were excluded if they had medical problems or any other psychiatric illnesses, including major depression. Treatment began between the months of September and November with extended-release bupropion, 150 mg daily, titrated to 300 mg daily for those who were able to tolerate it. In all three studies, the dosage was weaned to 150 mg per day in the first week of spring and then subsequently stopped.

Participants with confirmed SAD were asymptomatic at the start of all three studies. The primary outcome in two studies was the time to onset of depressive symptoms. In the third study, the primary end point was the difference in depression-free participants between the treatment and placebo groups at the end of the study. Depressive symptoms were measured using the Structured Interview Guide for the Hamilton Depression Rating Scale, Seasonal Affective Disorders (SIGH-SAD). The studies did not address the severity of SAD symptoms, quality of life, or quality of interpersonal/social functioning. Although this review did not specify how risk of recurrence was calculated, investigators considered the number of previous episodes of SAD and a patient-reported history of pattern and symptom severity using the Seasonal Pattern Assessment Questionnaire. Extended-release bupropion prevented episodes of SAD in some patients; its effectiveness increased with higher risk of recurrence. Patients with a 50% risk of episode recurrence were more likely to benefit from therapy (NNT = 5; 95% confidence interval [CI], 4 to 7) than patients with a 30% risk of recurrence (NNT = 8; 95% CI, 6 to 12).

Adverse effects were more common in participants taking extended-release bupropion and included headache (number needed to harm [NNH] = 15; 95% CI, 8 to 75), insomnia (NNH = 16; 95% CI, 9 to 56), and nausea (NNH = 20; 95% CI, 11 to 72). However, the overall discontinuation rate from adverse effects was not significantly different between treatment and placebo groups. None of the included studies compared extended-release bupropion with

nonpharmacologic therapies, including light therapy or psychotherapy. The studies also did not compare extended-release bupropion with other antidepressants. The three studies were sponsored by the pharmaceutical company that manufactures extended-release bupropion.

The United States does not currently have formal guidelines for the treatment or prevention of SAD. The Canadian Consensus Guidelines for the Treatment of Seasonal Affective Disorder discuss pharmacologic and nonpharmacologic treatment options.[5] However, well-designed trials directly comparing pharmacologic with nonpharmacologic options are lacking. When using extended-release bupropion for the prevention of SAD, the possibility of adverse effects should be considered in a shared decision-making process between physician and patient.

The practice recommendations in this activity are available at http://www.cochrane.org.

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Interventions to Facilitate Shared Decision Making to Address Antibiotic Use for Acute Respiratory Tract Infections in Primary Care

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Clinical Question

Do interventions that aim to facilitate shared decision making reduce the prescribing of antibiotics for acute respiratory tract infections in primary care?

Evidence-Based Answer

Interventions to facilitate shared decision making reduce the prescribing of antibiotics for acute respiratory tract infections in the short term (within six weeks of the consultation) without increasing return visits or decreasing patient satisfaction (number needed to treat [NNT] = 6).[1] (Strength of Recommendation: A, based on consistent, good-quality, patient-oriented evidence.)

Practice Pointers

Multiple systematic reviews have shown that antibiotics prescribed for acute respiratory tract infections have minimal benefit because these are predominantly viral infections.[2,3] According to the Centers for Disease Control and Prevention, more than one-half of antibiotic prescriptions in outpatient settings are inappropriately written for viral infections, contributing to resistant bacteria causing more than 2 million illnesses in the United States each year.[4,5] Shared decision making is a process by which the physician and patient share information including risks, benefits, the best available evidence, and personal values, ultimately reaching agreement on a plan of action.[6] This Cochrane review evaluated whether interventions educating physicians on shared decision making for acute respiratory tract infections reduce antibiotic prescribing for these infections in primary care.[1] For the purposes of this review, respiratory tract infections included acute cough, rhinosinusitis, pharyngitis, tonsillitis, laryngitis, otitis media, bronchitis, exacerbated chronic obstructive pulmonary disease, and influenza.

This Cochrane review included approximately 492,000 patients in nine randomized trials and one follow-up of an original trial.[1] Studies varied by the specific type of intervention and number of study arms. All interventions involved educating physicians about shared decision making and how to discuss differences between bacterial and viral infections. All included studies explicitly addressed shared decision making and had interventions that involved training or tools such as decision aids to assist physicians.

Pooled results from eight studies showed that interventions to facilitate shared decision making significantly decreased antibiotic prescriptions in the short term (less than six weeks) with an NNT of 6 (95% confidence interval, 4.8 to 6.7). Thus, for every six encounters for an acute respiratory tract infection with a physician educated on shared decision making, one fewer patient received a prescription for antibiotics. There was no significant increase in reconsultations for the same illness, hospital admissions, incidence of pneumonia, or mortality from respiratory illness, and no significant decrease in patient satisfaction. However, pooled results from three long-term studies showed that interventions did not lead to a sustained decrease in antibiotic prescriptions after 12 months.

Studies did not report on the incidence of infection caused by antibiotic-resistant organisms or the incidence of acute otitis media complications. One

limitation of this study is that the primary outcome is antibiotic prescribing. Because some clinicians may choose to write "wait-and-see" antibiotic prescriptions, data on prescriptions filled or actually taken would be more accurate. Additionally, all trials were conducted in Europe and Canada.

The Institute for Clinical Systems Improvement recommends using patient education measures as the primary treatment for acute respiratory tract infections and reserving antibiotics for bacterial infections.[7] A recent randomized controlled trial implemented clinician-focused interventions to require peer-justification and peer-comparison of antibiotic prescriptions; it showed a significantly lower rate of inappropriate antibiotic prescribing in the intervention group.[8] Additionally, the American Academy of Family Physicians' Choosing Wisely list recommends against prescribing antibiotics for otitis media in children two to 12 years of age when observation is a reasonable option and against prescribing antibiotics for acute sinusitis.[9] Health system leaders should consider interventions to facilitate shared decision making as one effective option to assist primary care physicians in reducing inappropriate antibiotic use for acute respiratory tract infections.

The practice recommendations in this activity are available at http://www.cochrane.org.

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