Acute sinusitis is diagnosed in over 3 million visits annually among adults and children in the United States. Of these, more than 80% result in an antibiotic prescription; however, many of these prescriptions may be unnecessary, since sinusitis is most often of viral origin and benefits of antibiotics may be limited. Prior to 2012, amoxicillin was the recommended empirical treatment for acute bacterial sinusitis; current guidelines now recommend amoxicillin-clavulanate. In light of recent studies and new treatment guidelines, we sought to examine visit rates and antibiotic prescribing patterns for adults with acute sinusitis in the United States.

Methods. We analyzed data from the National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey (NHAMCS) between 2000 and 2009 to estimate visit rates and antibiotic prescribing for acute sinusitis in adults. We estimated the annual number of acute sinusitis visits per 1000 adults in the United States. Acute sinusitis was designated for visits in which any of 3 diagnosis fields contained the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) code for acute sinusitis (461.x). We excluded visits for acute sinusitis that had concomitant diagnoses that could potentially require antibiotics (eg, urinary tract infections) and visits that resulted in hospital admission. We also excluded visits where an aminoglycoside or vancomycin was prescribed, since those patients were presumed to have more serious or atypical infections.

In analyses of antibiotic selection, we restricted our sample to those visits where acute sinusitis was the primary diagnosis. The primary outcome measures were the proportion of visits for acute sinusitis in which any antibiotic was prescribed (antibiotic visits) and the proportion of antibiotic visits in which amoxicillin was prescribed.

All statistical analyses were performed using STATA 11 software (StataCorp) and accounted for the components of the complex survey design. For analysis of time trends, we grouped the survey data and census denominators in five 2-year intervals as recommended by the National Center for Health Statistics.

Results. Between 2000 and 2009, there was a mean of 4.3 million (95% CI, 3.6-4.9 million) outpatient visits per year. Acute sinusitis was diagnosed in 0.5% (95% CI, 0.4-0.5%) of all outpatient visits among adults during this period. The annual visit rate averaged 19.4 visits (95% CI, 16.5-22.3) per 1000 adults and did not change during the study period.

Antibiotics were prescribed in 83% (95% CI, 78%-86%) of visits for acute sinusitis, and this proportion did not change significantly during the study period (P=0.85), which ranged from 74% (95% CI, 62%-83%) to 87% (95% CI, 78%-93%) of visits during this period. In addition, there were no changes in the overall rates of prescribing for any specific antibiotic class or antibiotic agent among visits (n=1934) where an antibiotic was prescribed. The proportion of visits in which amoxicillin, the recommended agent, was prescribed was 17% (95% CI, 12%-23%) (Figure). Among the antibiotics prescribed other than amoxicillin, the most commonly prescribed were macrolides (29%), quinolones (19%), and amoxicillin-clavulanate (16%).

Comment. In the present study, using a nationally representative data set of ambulatory visits, we found that more than 80% of patients diagnosed as having acute sinusitis receive an antibiotic, despite mounting evidence that the benefits of antibiotic treatment for sinusitis are limited. Furthermore, we found that nearly 50% of patients diagnosed as having acute sinusitis received either a macrolide or a quinolone, while fewer than 20% received amoxicillin, the recommended first-line treatment during the study period. The frequent use of macrolides, as shown in this study, is particularly concerning because macrolide use has been associated with treatment failures for respiratory tract infections. Although likely to be effective, fluoroquinolones are usually unnecessary for sinusitis, and overuse is an important risk factor for colonization and infection with resistant organisms.
We acknowledge limitations to this study. Because sinusitis is diagnosed based on physical examination findings and symptoms, data not captured in NAMCS/NHAMCS, we were unable to determine which patients had acute bacterial sinusitis as strictly defined based on the criteria suggested by recent clinical guidelines. We were also not able to determine if patients receiving antibiotic treatment had recurrent sinusitis or had previously experienced treatment failure with narrow-spectrum therapy for sinusitis, either of which might have made prescription of a broad-spectrum agent acceptable. Previous studies have suggested, however, that bacterial sinusitis composes a relatively small fraction of acute sinusitis cases seen in primary care, and treatment failure is also uncommon. We were also unable to determine which patients had an allergy to recommended agents.

This study highlights that prescribing of broad-spectrum antibiotics for sinusitis, especially quinolones and macrolides, is extremely common. This is an important target for antimicrobial stewardship efforts partially because the benefits of antibiotic therapy are limited. Qualitative research to explore the health care provider and patient attitudes that influence antibiotic selection is a next step to understanding the problem. Also critically important are adoption of clinical guidelines that promote appropriate antibiotic use. Changes in prescribing behavior of health care providers for sinusitis are urgently needed to improve health care quality and stem the rising tide of antibiotic resistance in the United States.

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Periprocedural Management of the Patient With Diabetes Mellitus Undergoing Coronary Angiography: Current Practice

Despite advances in procedural technique and pharmacotherapy, patients with diabetes mellitus (DM) experience worse outcomes than patients without DM undergoing percutaneous coronary intervention (PCI). Periprocedural hyperglycemia is associated with adverse clinical outcomes in patients undergoing PCI, and studies have suggested that treating periprocedural hyperglycemia may improve outcomes by attenuating glucose-mediated ischemic injury at the time of PCI. Simple preventive strategies, such as continuing long-acting hypoglycemic medications, have not been evaluated, and there are no guidelines for periprocedural use of these medications.

We conducted an anonymous electronic survey of cardiologists referring patients for coronary angiography using the American Heart Association Cardiology Fellows Society of Greater New York and the Society of Cardiovascular Angiography and Interventions from March through July 2011. Of the 144 survey responders, 24% were fellows-in-training, and 33% were faculty at a medical school. Among this cohort, 60% believed that hyperglycemia at the time of PCI is harmful, and 94% believed that hypoglycemia at the time of PCI is harmful. Although most clinicians routinely hold oral hypoglycemic medications prior to angiography, substantial numbers do not, with nearly half routinely continuing thiazolidinediones on the morning of coronary angiography (Table). Clinicians are more likely to continue insulin-based regimens than oral medications, but again there is no uniformity of practice. In patients with uncontrolled DM (glycosylated hemoglobin level >10% or blood glucose levels >200 mg/dL), a little more than one-third of physicians reported they would change their usual practice and continue hypoglycemic medications prior to coronary angiography. (To convert glycosylated hemoglobin to a proportion of total hemoglobin, multiply by 0.01; to convert serum glucose to millimoles per liter, multiply by 0.0555.)