

videos, may be limited by low participation rates even in the setting of Internet access. Second, such endeavors should include assessments of why patients fail to use online resources to allow appropriate alterations in strategy. Third, more aggressive efforts to help subjects view the video might have increased usage rates. For example, our nurse could have walked subjects through the process of accessing the video on the reminder call. Fourth, Internet-based patient resources may not be suitable for all older patients or those with limited education. This becomes an important consideration as the nation prepares itself for online insurance exchanges and an expansion of Medicare's Physician Compare website.

The Internet provides a unique platform for disseminating health information. However, limited patient interest and lower rates of internet access among older and less well-educated patients should be considered when planning Internet-based health care initiatives.

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**Published Online:** June 3, 2013.  
doi:10.1001/jamainternmed.2013.6477.

**Author Contributions:** *Study concept and design:* Kakkar, Jacobson.  
*Acquisition of data:* Kakkar, Jacobson.  
*Analysis and interpretation of data:* Jacobson.  
*Drafting of the manuscript:* Kakkar, Jacobson.  
*Critical revision of the manuscript for important intellectual content:* Jacobson.  
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**Conflict of Interest Disclosures:** None reported.

**Previous Presentation:** Findings from this study were presented as a poster at Digestive Disease Week (Kakkar A, Jacobson BJ. Internet-based education and "physician compare" websites may discriminate against older and disadvantaged patient populations); May 7-10, 2011; Chicago, Illinois.

**Trial Registration:** clinicaltrials.gov Identifier: NCT01099553

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## Editor's Note

### Patient Education: One Size Does Not Fit All

There is tremendous enthusiasm for web-based educational tools, particularly as more patients seek health information through the Internet. However, as Kakkar and Jacobson describe in this issue, there is a gap between the interest in web-based educational tools and real-world usage—only 6% of patients in the study viewed the online material. Their results are consistent with other studies showing low viewing rates of web-based interventions. Therefore, although web-based tools are an important avenue for patient education, this study highlights that even well-designed tools will not be effective if they are not used.

Patients have different educational needs and preferences. For example, some patients may not have access to or may not wish to use web-based educational tools. Thus, rather than offering all patients access to the same educational materials, physicians will likely need a menu of different resources using multiple modalities to most effectively educate and communicate with their patients. Assessing patient information needs, collecting usage data, and determining methods to match the right tools to the right patient should be part of future research to assist clinicians in providing the best education for their patients.

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**Published Online:** June 3, 2013.  
doi:10.1001/jamainternmed.2013.7402.

## RESEARCH LETTER

### Management of Antimicrobial Allergies by Infectious Diseases Physicians

Misconceptions about true antimicrobial allergy may result in less effective, more expensive therapy and adverse outcomes.<sup>1,2</sup> Correctly identifying allergies could significantly reduce the immediate and direct risks of drug-related adverse events.<sup>3</sup> For example, 9 of 10 patients who reported an allergy to penicillin were, in fact, not, when evaluated by skin testing (ST).<sup>4</sup> To appropriately use first-line agents, it is important to determine if the patient truly has an antimicrobial allergy. Such efforts could contribute to better antimicrobial stewardship.

**Methods** | To better understand physicians' perceptions and knowledge about allergy, a 10-item survey was e-mailed to Infectious Diseases Society of America (IDSA) Emerging Infections Network (EIN) members, a sentinel network of infectious diseases (ID) physicians across North America. Data were analyzed using SAS version 9.3 statistical software (SAS Institute Inc).

**Results** | Of 1411 IDSA EIN members, 744 (53%) responded: 72% were adult ID physicians; 23%, pediatric ID physicians; and 5%, both. A total of 78% had been consulted at least once in the last month about antimicrobial management of patients with

**Table. Rank Order of Infectious Diseases Physicians' Perceptions About the Usefulness of Each of the Following Questions in the Diagnosis of Allergy<sup>a</sup>**

Perceptions	No. of Respondents	Ranking	
		Mean	Median
Receipt of same antibiotic/class since initial reaction	668	1.11	1
Characteristics of the reaction	667	1.19	1
Patient's recollection of the reaction	669	1.61	1
Reported allergies to other agents	665	2.07	2
Time from beginning antibiotic to onset of reaction	669	2.16	2
Patient's age at the time of the initial reaction	666	2.34	2
Other concurrent medications	669	2.41	2
Purpose of taking antibiotic	669	3.29	3

<sup>a</sup>Ranking: 1 = very useful, 3 = neutral, and 5 = not at all useful.

“antimicrobial allergy.” The most common sources of information for the allergy history were the patient or family member (97%) and medical records (89%). Perceptions of the usefulness of selected questions when assessing an antimicrobial allergy are given in the **Table**. Respondents indicated that ID physicians often “dispel” incorrect allergies and suggested more efforts to educate health care providers.

Penicillin ST was available to 60% of respondents and was performed mostly by allergy and/or immunology physicians (90%). Of the respondents with available testing, 88% reported that preoperative ST was available for elective surgical procedures, but of these, such ST was not routinely performed in 75%. Main barriers to penicillin ST were unavailability of ST materials or personnel (eTable in Supplement).

To assess the care of patients with possible allergies, we developed clinical scenarios. Case 1 was an adult with remote history of mild skin reaction to a sulfa medication, diagnosed as AIDS and severe *Pneumocystis jiroveci* pneumonia. Respondents selected trimethoprim-sulfamethoxazole (TMP-SMX) (35%), TMP-SMX desensitization per protocol (32%), or alternative agents (33%). Case 2 had a remote history of mild pruritic skin reaction to penicillin and was receiving vancomycin for methicillin-susceptible *Staphylococcus aureus* (MSSA) bacteremia. Of the respondents, 64% changed to a  $\beta$ -lactam medication without ST; 24% discontinued vancomycin therapy and started a  $\beta$ -lactam-only therapy if the ST result was negative; and 12% continued vancomycin therapy without ST. Case 3 had a history of mild  $\beta$ -lactam allergy and required treatment for MSSA bacteremia. Respondents selected 1 or more of the following options: cephalosporin (81%), vancomycin (20%), daptomycin (12%), penicillin ST (12%), a  $\beta$ -lactam (7%), and a carbapenem (6%).

An IDSA guideline on management of antimicrobial allergy was perceived as the educational resource most likely to be useful (92%), followed by online training (37%) and campaigns for patients and health care providers (33%).

**Discussion** | Our study shows that ID physicians are frequently consulted to evaluate patients with antimicrobial allergies. This is not surprising because 25% of hospitalized patients requiring antimicrobial therapy report allergy to at least 1 agent, usually penicillin.<sup>5</sup> Most respondents reported that a thorough history and review of the medical record were the most informative and cost-effective ways to avoid the use of unnecessary alternative antimicrobials. Importantly, studies have

shown that “allergy labels” are overused, lead to misclassification of patients as allergic, and are associated with increased length of stay, receipt of more than 1 antibiotic and worse outcomes.<sup>6</sup> Some studies have shown that penicillin ST can reduce unnecessary use of alternative agents.<sup>7</sup> Skin testing has a high negative predictive value (99.3%), and a 40% to 100% positive predictive value for identifying patients at low risk for developing IgE-mediated reaction to  $\beta$ -lactams.<sup>1</sup>

In our vignettes, one-third of respondents would have treated with an alternative antimicrobial, although TMP-SMX is recommended as first-line therapy for *P jiroveci* in national human immunodeficiency virus guidelines. In cases 2 and 3, a nontrivial proportion of respondents selected vancomycin or other non- $\beta$ -lactam antimicrobial. These results have important implications because treatment of MSSA bacteremia with nafcillin or cefazolin is independently associated with a 79%-lower adjusted rate of mortality compared with vancomycin.<sup>8</sup> In addition, switching from vancomycin to a  $\beta$ -lactam therapy in patients with MSSA bacteremia is associated with reduced mortality compared with the patient remaining on vancomycin therapy.<sup>8,9</sup>

When treating severe staphylococcal infections, physicians must balance the relative ease of continued administration of potentially less-effective antimicrobials with the more effective but challenging administration of  $\beta$ -lactams. Despite existing recommendations suggesting prudent vancomycin use, this agent continues to be inappropriately used, particularly for patients reporting questionable penicillin allergy.<sup>5</sup>

In conclusion, our results show that ID physicians play an important role in diagnosing and caring for patients who report antimicrobial allergies. Further research is needed to evaluate the impact of reported allergies on antimicrobial stewardship, the importance of drug reconciliation, a detailed history, and the clinical usefulness of ST to confirm allergy reports. More accurate use of “allergy labels” may improve antimicrobial use by allowing clinicians to safely prescribe more first-line agents (eg, penicillin). Antimicrobial-specific guidelines from IDSA should be considered to assist ID physicians in allergy management.

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**Published Online:** June 3, 2013.  
doi:10.1001/jamainternmed.2013.6480.

**Author Contributions:** *Study concept and design:* All authors.  
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*Analysis and interpretation of data:* All authors.  
*Drafting of the manuscript:* Abbo, Beekmann, Hooton.  
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*Study supervision:* Abbo, Hooton, Polgreen.

**Conflict of Interest Disclosures:** None reported.

**Group Information:** Information about the Infectious Diseases Society of America Emerging Infections Network is available at <http://ein.idsociety.org>.

**Previous Presentation:** Preliminary data from this study were presented at IDWeek: Annual Meeting of The Infectious Diseases Society of America (IDSA), the Society for Healthcare Epidemiology of America (SHEA), the HIV Medicine Association (HIVMA), and the Pediatric Infectious Diseases Society (PIDS); October 17-21, 2012; San Diego, California.

**Additional Contributions:** Antoine Azar, MD, Carver College of Medicine, University of Iowa, contributed to the study design and review of the manuscript.

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### Sources of Discomfort in Persons With Dementia

Current methods to assess discomfort often include ratings scales, such as the discomfort scale for Alzheimer disease, which are also used to assess pain.<sup>1,2</sup> In this study, we take an alternative approach in which we examine the discomfort in the context of its source.

**Methods** | Participants included 179 agitated nursing home residents with dementia (mean age, 86 years; 72% female; mean Mini-Mental State Examination [MMSE] score, 8.79) from 10 nursing homes in Maryland. Residents' discomfort was observed as part of the study for the Treatment Routes for Exploring Agitation (TREA) that received institutional review board approval of Charles E. Smith Life Communities.<sup>3</sup>

The Source of Discomfort Scale (SODS) was developed on the basis of our experience observing persons with dementia and noticing different types of discomfort. It included some questions to the resident, such as "How are you? Are you comfortable?" and mostly observational items, such as seeing a resident's head lying unsupported or a leg dangling. The SODS was completed by several trained research assistants who observed each participant during 3 days (13 hours a day, for 3 minutes every half hour). Each research assistant completed the SODS once, during the shift on the third day of observation of each resident.

Cognitive functioning was assessed by the MMSE.<sup>4</sup> Pain was assessed for half of the participants through administering the Pain Assessment in Elderly Persons (PAINE)<sup>5</sup> to the participants' direct nursing care caregivers. The PAINE has been shown to be useful in detecting pain that responds to analgesic intervention in persons with dementia.<sup>6</sup> Both the MMSE and the PAINE were administered by trained research assistants.

**Results** | The distribution of sources and indicators of discomfort, based on the SODS, is presented in the **Table**. Among participants, the most common sources or indications of discomfort were being sleepy or tired (61.5%); sitting in the same place without movement for over 2 hours (49.7%); having physical restraints (28.5%); having insufficient light (27.4%); and moving in the seat (25.7%). Other sources of discomfort that were observed for more than 10% of the participants were feeling cold and having furniture in the way of the resident. Overall, participants were observed as having 0 to 10 sources of discomfort, with a mean (SD) of 3.0 (2.1).

The correlation between PAINE score and the number of sources of discomfort was  $r = 0.287$  ( $P = .006$  [ $n = 89$ ]), indicating that the PAINE explained 8% of the variance in SODS. Those who answered "no" to the question "How are you? Are you comfortable?" had significantly higher mean PAINE scores than those who either responded in the affirmative or did not respond (5.22 and 3.26, respectively;  $t_{87} = 3.11$  [ $P = .002$ ]); those with their leg dangling had significantly higher mean PAINE scores than those who did not (5.21 and 3.28, respectively;  $t_{87} = 2.87$  [ $P = .005$ ]).

**Discussion** | We found a very high prevalence of discomfort in nursing home residents with dementia. Specifically, 3 to 4 short observations revealed up to 10 sources of discomfort in participants, with a mean of 3 sources per person. While assessment of discomfort is only the first step in alleviating it, it is a necessary step. Furthermore, with some of the sources of discomfort, our methodology directs the caregiver to an intervention. For example, dangling leg and unsupported head have direct seating implications.