

# Doing the Right Thing for Asymptomatic Bacteriuria: Knowing Less Leads to Doing Less

Aanand D. Naik<sup>1,2</sup> and Barbara W. Trautner<sup>1,2</sup>

<sup>1</sup>Houston Center for Innovations in Quality, Effectiveness, and Safety, Michael E. DeBakey Veterans Affairs Medical Center, and <sup>2</sup>Department of Medicine, Baylor College of Medicine, Houston, Texas

(See the Brief Report by Leis et al on pages 980–3.)

**Keywords.** clinical practice guidelines; asymptomatic bacteriuria; asymmetric paternalism; behavioral economics; decision psychology.

Clinical practice guidelines are the preferred method among professional societies for defining safe and effective healthcare. Despite widespread dissemination by professional societies, the impact of guidelines on routine clinical practice remains suboptimal [1]. The Infectious Diseases Society of America guidelines for asymptomatic bacteriuria (ASB) are a particularly salient example [2], with one-third to two-thirds of patients with ASB inappropriately receiving treatment with antimicrobial agents [3, 4]. Urine cultures are often ordered reflexively when patients are admitted to the hospital or have any change in status in long-term care, regardless of the absence of urinary symptoms [3–5]. Clinicians react to positive results on these cultures by prescribing unnecessary antimicrobial agents, frequently swayed by guidelines-

discordant cognitive biases regarding older age and frailty, pyuria on urinalysis, and the particular types of bacterial organisms (eg, gram-negative rods) on urine culture results [3, 5].

In this context, the very simple intervention by Leis et al [6] published in this edition of *Clinical Infectious Diseases* is particularly elegant. The authors explored the effectiveness of suppressing reporting of urine culture results when ordered for noncatheterized patients. Instead of receiving urine culture results as the default option, clinicians received a standardized statement declaring, “The majority of positive urine cultures from inpatients without an indwelling urinary catheter represent asymptomatic bacteriuria” [6]. They were encouraged to call the microbiology laboratory if they “strongly suspected” a urinary tract infection. The positive results of this study are provocative on many levels. First, they confirm the significantly higher prevalence of ASB (86%) vs urinary tract infections (14%) among the 74 cultures from patients without urinary catheters. Second, in patients whose urine cultures were reported openly, as per the standard approach, nearly half of all patients with confirmed ASB received antibiotics. Third, the intervention design

had a strong effect on clinician behavior. When the default of reporting culture results was removed, the rate of guidelines-discordant treatment for ASB dropped from 48% to 12%, and clinicians called the microbiology laboratory for only 14% (5 of 37) of suppressed culture results. Only 4 urinary tract infections occurred in noncatheterized patients, and in each of these cases clinicians had empirically started therapy, with the presumption that clinically significant symptoms of urinary tract infection were present. Furthermore, no untreated patients had clinically significant signs of sepsis or urinary tract infection 72 hours after urine culture collection.

The study has limitations that should be addressed prior to conducting a large-scale evaluation. The investigators acknowledge that they studied a small sample of patients and clinicians at only one institution. The rationale for using patients with urinary catheters as the comparison group to the intervention sample of noncatheterized patients is not clear. Treatment decisions may differ between these groups in ways that are better explained by clinical factors rather than customary and default decision errors. Finally, any large-scale intervention

Received 13 December 2013; accepted 29 December 2013; electronically published 26 February 2014.

Correspondence: Barbara Trautner, MD, PhD, Houston Health Services Research and Development Center of Excellence (152), Michael E. DeBakey VAMC, 2002 Holcombe Blvd, Houston, TX 77030 (trautner@bcm.edu).

**Clinical Infectious Diseases** 2014;58(7):984–5

Published by Oxford University Press on behalf of the Infectious Diseases Society of America 2014. This work is written by (a) US Government employee(s) and is in the public domain in the US. DOI: 10.1093/cid/ciu011

trial will encounter both safety and ethical challenges requiring tight oversight by a data and safety management board to follow the outcomes of patients who do not receive therapy after a urine culture is ordered but not reported [7].

Interventions to improve concordance with clinical practice guidelines are often complex, with multiple components and/or clinical targets. An alternative approach adapted from behavioral economics advocates the selective use of “asymmetric paternalism to improve health behaviors [8].” Asymmetric paternalism is a policy approach that attempts to help individuals achieve their own goals, especially when individuals are prone to decisional biases and errors, without actually limiting choices or freedoms. The most common strategy consists of reframing the description of choices to bias decision making in favor of more beneficial options [8, 9]. In other words, the provider is presented with information selectively in a manner that makes the right choice the most obvious and easy one to select [7]. For example, the microbiology laboratory at our institution only displays the sensitivities of an organism for antibiotics on our formulary, so that providers will choose from among agents readily available at our hospital.

Asymmetric paternalism is new term but an old concept. A poem by Emily Dickinson (1830–1886) exhorts us to “Tell all the Truth,” but to reveal the truth gradually rather than all at once, lest the full truth “dazzle” the recipient’s eyes. The study by Leis et al [6] represents an interesting proof-of-concept study for the use of asymmetric paternalism to reduce inappropriate treatment of ASB. Because positive results from urinalysis and urine cultures for ASB are likely to trigger cognitive biases favoring initiation vs withholding treatment, it may be prudent to change the standard and default practices regarding ordering and reporting of

urine culture results in patients with likely ASB. The study’s change in the default option likely forced clinicians to more deliberately reassess the pretest probability of urinary tract infection vs ASB. If physicians do not really want the results, there is no need to present them with a positive urine culture that will blind them to the lack of urinary-associated symptoms and trigger inappropriate prescribing behavior [7].

Behavioral economics approaches have limitations [9]. Changes to default options are effective at avoiding biases and errors, but they need to be coupled with an intervention that can correct the source of these errors to ensure a more lasting effect. Clinicians make errors (treat ASB with antibiotics) when they use the wrong clinical cues (patient is a frail older adult) or rules of thumb (treat when pyuria is present on urinalysis) to guide their decisions [5]. We are currently testing a brief “fast and frugal” algorithm [10] to alert clinicians to guidelines-concordant symptoms of urinary tract infections and embedding the algorithm within an audit and feedback intervention to reduce treatment for ASB [5, 11]. Our study, like the one by Leis et al [6], highlights the importance of integrating evidence-based theories from the social and behavioral sciences to ensure safe and effective healthcare. In the bigger picture, interventions that lead to fewer courses of unnecessary antibiotics given in hospital settings may in turn decrease the rates of *Clostridium difficile* and multidrug-resistant infections. Now, that in truth would be a dazzling result.

## Notes

**Disclaimer.** The opinions expressed are those of the authors and do not necessarily represent those of the Department of Veterans Affairs. The funding source had no role in the preparation, review, or approval of the manuscript.

**Financial support.** This work was supported in part by the Center for Innovations in Quality,

Effectiveness and Safety (CIN 13–413) at the Michael E. DeBakey VAMC.

**Potential conflicts of interest.** Both authors: No reported conflicts.

Both authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

## References

1. Laine C, Taichman DB, Mulrow C. Trustworthy clinical guidelines. *Ann Intern Med* **2011**; 154:774–5.
2. Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. *Clin Infect Dis* **2005**; 40:643–54.
3. Lin E, Bhusal Y, Horwitz D, Shelburne SA, Trautner BW. Overtreatment of enterococcal bacteriuria. *Arch Intern Med* **2012**; 172:33–8.
4. Leis JA, Gold WL, Daneman N, Shojania K, McGeer A. Downstream impact of urine cultures ordered without indication at two acute care teaching hospitals. *Infect Control Hosp Epidemiol* **2013**; 34:1113–4.
5. Trautner BW, Bhimani RD, Ampsokor AB, et al. Development and validation of an algorithm to recalibrate mental models and reduce diagnostic errors associated with catheter-associated bacteriuria. *BMC Med Inform Decis Mak* **2013**; 13:48.
6. Leis JA, Rebick GW, Daneman N, et al. Reducing antimicrobial therapy for asymptomatic bacteriuria among noncatheterized inpatients: a proof-of-concept study. *Clin Infect Dis* **2014**; 58:980–3.
7. Blumenthal-Barby JS, Cantor SB, Russell HV, Naik AD, Volk RJ. Decision aids: when ‘nudging’ patients to make a particular choice is more ethical than balanced, nondirective content. *Health Aff* **2013**; 32:303–10.
8. Loewenstein G, Brennan T, Volpp KG. Asymmetric paternalism to improve health behaviors. *JAMA* **2007**; 298:2415–7.
9. El-Serag HB, Naik AD. Surveillance in Barrett’s esophagus: lessons from behavioral economics. *Gastroenterology* **2009**; 137:763–5.
10. Gigerenzer G, Gaissmaier W. Heuristic decision making. *Annu Rev Psychol* **2011**; 62:451–82.
11. Trautner BW, Kelly PA, Petersen N, et al. A hospital-site controlled intervention using audit and feedback to implement guidelines concerning inappropriate treatment of catheter-associated asymptomatic bacteriuria. *Implement Sci* **2011**; 6:41.