

## RESEARCH LETTERS

**Appropriateness of Urinary Tract Infection Diagnosis and Treatment Duration**

**A**lthough urinary tract infection (UTI) is a frequent indication for antimicrobial therapy, the appropriateness of diagnosis and treatment duration is largely unknown.<sup>1</sup> High-quality evidence supports withholding antimicrobial agents for asymptomatic bacteriuria and/or pyuria; similar evidence supports short-duration therapy in women with uncomplicated UTI.<sup>2,3</sup> The optimal treatment duration for men (or women with complicating conditions) with UTI is less well defined, although available evidence and expert opinion suggest that longer treatment durations are needed.<sup>4-6</sup> However, it is unknown to what extent these recommendations are followed.

**Methods.** We retrospectively reviewed records of ambulatory patients diagnosed as having UTI at the Minneapolis Department of Veterans Affairs Medical Center (MVAMC) to determine the frequency of inappropriate UTI diagnosis (ie, receiving therapy for UTI in the absence of clinical manifestations), nonrecommended treatment duration (according to sex and presence or absence of complicating conditions [eTable 1; <http://www.archinternmed.com>]), and practice variability. Assessed outcomes were retreatment and adverse drug events (ADEs), including *Clostridium difficile* infection, 30 days after therapy. Any documentation of a conceivably relevant symptom or finding (eTable 2) qualified a UTI diagnosis as appropriate. Based on available evidence and expert opinion, we defined appropriate treatment duration as follows: if no complicating conditions, 3 days (women) or 7 days (men); if complicating conditions, 7 days (women) or 10 to 14 days (men).<sup>4-6</sup> A sensitivity analysis was performed, in which a less-restrictive definition of appropriate treatment duration was used (3 days for women without complicating conditions; otherwise, 7-14 days).

**Results.** During the 8-month study period, 466 visits to the emergency department or primary care clinic were coded as UTI. Of these, 122 were repeated visits and 114 met exclusionary criteria (historical [vs current] UTI, hospital admission, and no documentation of UTI), leaving 230 unique (by patient) visits involving an acute UTI diagnosis. Of the corresponding 230 patients, 5 were documented as representing asymptomatic bacteriuria, despite being coded as UTI, leaving 225 patients as the study population.

At the index visit, nearly all subjects (98%) had a urinalysis performed; 95% of those yielded an abnormality consistent with UTI. In contrast, only 78% of subjects had a urine culture performed, including 77% of those with complicating conditions; 85% of urine cultures were positive (defined as any microbial growth). Clinical criteria for UTI were absent in 21% (95% confidence interval, 16%-27%) of subjects, implying inappropriate diagnosis and therapy. Of these 47 inappropriately diagnosed subjects, 13 (28%; 6% overall) reportedly had altered mental status or a cognitive or sensory impairment that could render the history unreliable, whereas 34 (72%; 15% overall) lacked even these questionable features.

Treatment duration qualified as appropriate in 57% of subjects (95% confidence interval, 50%-63%), and in the remaining 43%, treatment duration was either inappropriately short (28%) or long (16%) (**Table**). Appropriate therapy duration was significantly more common among subjects with vs without complicating conditions (68% vs 33%;  $P < .001$ ). When we used a less-restrictive definition of appropriate duration for a sensitivity analysis, the number of subjects receiving appropriate-duration therapy increased to 177 (79%), leaving 48 (21%) still with inappropriate therapy duration.

Retreatment for UTI within 30 days occurred for 16% of subjects and was associated with insufficient initial therapy duration. Specifically, among 152 men with a complicating condition (68% of the total population), subsequent retreatment was significantly more frequent among those treated initially for only 3 to 7 days (17 of 49) vs the recommended 10 to 14 days (17 of 103) ( $P = .02$ ). This difference persisted with the less-restrictive definition of appropriate therapy duration, with retreatment being significantly more common among those treated initially for 3 to 5 days (12 of 25) vs 7 to 14 days (23 of 127) ( $P = .003$ ).

Adverse drug events were documented for 10 subjects (4%) (4 with rash and 6 with diarrhea), including 9% of those who were treated inappropriately. *Clostridium difficile* testing was done for 4 of 6 subjects with diarrhea; 2 (both inappropriately treated for UTI) had positive toxin and culture results, giving a 1% overall rate of confirmed posttherapy *C difficile* infection.

**Comment.** We retrospectively found that at our VAMC (1) 21% of subjects treated for UTI lacked evidence of clinically significant disease, (2) urine cultures were underused, (3) UTI treatment duration was often inappropriate, (4) retreatment was more likely when men with complicating conditions received too-short therapy duration (ie, 3-7 days), and (5) adverse drug events were common, including among patients treated unnecessarily. As for why asymptomatic patients are diagnosed as having and treated for UTI, some health care providers

**Table. Appropriateness of Duration of Antimicrobial Therapy According to Sex and Complicating Condition Status Among 225 Veterans With Suspected Urinary Tract Infection<sup>a</sup>**

Complicating Condition(s)	Veterans (N=225)	Duration of Therapy			
		Appropriate <sup>b</sup>	Inappropriate		
			Too Long or Too Short	Too Long	Too Short
<b>Men</b>					
Present	152 (68)	103 (68)	49 (32)	0	49 (32)
Absent	51 (23)	14 (27)	37 (73)	25 (49)	12 (24)
Present or absent	203 (90)	117 (58)	86 (42)	25 (12)	61 (30)
<b>Women</b>					
Present	3 (1)	2 (67)	1 (33)	0	1 (33)
Absent	19 (8)	9 (47)	10 (53)	10 (53)	0
Present or absent	22 (10)	11 (50)	11 (50)	10 (45)	1 (5)
<b>Either</b>					
Present	155 (69)	105 (68)	50 (32)	0	50 (32)
Absent	70 (31)	23 (33)	47 (67)	35 (50)	12 (17)
Present or absent	225 (100)	128 (57)	97 (43)	35 (16)	62 (28)

<sup>a</sup>Data are given as number (percentage) of veterans. A sensitivity analysis also was performed using an alternate definition of appropriate duration, as described in the "Methods" section.

<sup>b</sup>Appropriate duration was defined as 3 days (women without complicating conditions), 7 days (women with complicating conditions and men without such conditions), and 10 to 14 days (men with complicating conditions).

may feel uncomfortable ignoring bacteriuria and/or pyuria, despite an absence of relevant clinical manifestations. Although many health care providers realize that excessive antimicrobial use can be harmful and should be avoided, some clearly need to be reminded about the complete absence of evidence supporting antimicrobial therapy for abnormal urinalysis findings in patients who lack genitourinary symptoms and of the importance of adjusting treatment duration for symptomatic UTI according to host factors. Our findings suggest that management of UTI among veterans offers abundant opportunities for improving efficacy, reducing unnecessary antimicrobial use, and limiting harms.

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**Author Contributions:** Dr Drekonja had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis. *Study concept and design:* Johnson. *Acquisition of data:* Drekonja and Okoye. *Analysis and interpretation of data:* Drekonja, Kuskowski, and Johnson. *Drafting of the manuscript:* Drekonja. *Critical revision of the manuscript for important intellectual content:* Okoye, Kuskowski, and Johnson. *Statistical analysis:* Kuskowski. *Administrative, technical, and material support:* Drekonja and Okoye. *Study supervision:* Drekonja and Johnson.

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**Online-Only Material:** eTables 1 and 2 are available at <http://www.archinternmed.com>.

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### Continuous Deep Sedation Until Death in Belgium: A Nationwide Survey

In recent years much debate has focused on the practice of continuous deep sedation until death and its acceptability on an ethical level. While many view its performance as part of normal medical practice, provided that particular safeguards are met, it is also believed to be a covert form of euthanasia in some cases and thus

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morally equivalent to euthanasia.<sup>1</sup> As a result, several guidelines have been issued worldwide relating to the conditions and modalities of its use.<sup>1-3</sup> First, sedation should not be aimed at hastening death. The patient should be