

Things We Do for No Reason™: Obtaining Urine Testing in Older Adults With Delirium Without Signs or Symptoms of Urinary Tract Infection

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Inspired by the ABIM Foundation's Choosing Wisely® campaign, the "Things We Do for No Reason™" (TWDFNR) series reviews practices that have become common parts of hospital care but may provide little value to our patients. Practices reviewed in the TWDFNR series do not represent clear-cut conclusions or clinical practice standards but are meant as a starting place for research and active discussions among hospitalists and patients. We invite you to be part of that discussion.

CLINICAL SCENARIO

A 78-year-old female nursing home resident presents to the emergency department for evaluation of a several-hour history of confusion and restlessness. The patient is accompanied by one of her caregivers from the nursing home. Initial evaluation reveals an awake but inattentive, disoriented, and agitated woman who can answer basic questions appropriately. The caregiver denies the patient having had any antecedent concerns, such as pain with urination, abdominal pain, subjective fevers, chills, or night sweats. Vital signs include a temperature of 37.5 °C (99.5 °F), heart rate of 90 beats per minute, blood pressure of 110/60 mm Hg, respiratory rate of 14 breaths per minute, and oxygen saturation of 98% on room air. The patient has a normal lung and abdominal exam without any suprapubic or flank tenderness. There is no Foley catheter in place.

BACKGROUND

Delirium, defined by the World Health Organization's 10th revision of the *International Classification of Diseases* as "an etiologically nonspecific organic cerebral syndrome characterized by concurrent disturbances of consciousness and attention, perception, thinking, memory, psychomotor behavior, emotion, and the sleep-wake schedule," is associated with poor clinical outcomes in older patients.^{1,2} Mental status changes, which can arise rapidly over the course of hours to days, often fluctuate, with most cases resolving within days of onset.³ In the United States, more than 2.6 million adults aged 65 years and older develop delirium each year, accounting for an estimated \$38 to \$152 billion in annual healthcare expenditures.⁴

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Received: December 24, 2020; Revised: March 10, 2021;

Accepted: March 16, 2021

© 2021 Society of Hospital Medicine DOI 10.12788/jhm.3620

WHY YOU MIGHT THINK URINE TESTING IS HELPFUL IN OLDER ADULTS WITH DELIRIUM WHO HAVE NO SIGNS OR SYMPTOMS OF URINARY TRACT INFECTION

Some clinicians believe that the evaluation for delirium should include an empiric urinary infectious workup with urinalysis and/or urine cultures, even in the absence of local genitourinary symptoms or other signs of infection. In fact, altered mental status is the most common indication for ordering a urine culture in older adult patients.⁵

Urinary tract infections (UTIs) account for almost 25% of all reported infections in older patients, with delirium occurring in up to 30% of this patient population.⁶ As one study demonstrated, given this population's very high prevalence of asymptomatic bacteriuria (ASB), urine studies sent during a delirium workup often yield positive findings (defined as $\geq 10^5$ colony-forming units [CFU]/mL [$\geq 10^8$ CFU/L]) in older patients with no signs or symptoms attributable to UTI.⁷ The incidence of ASB increases significantly with age, with prevalence estimated to be between 6% and 10% in women older than 60 years and approximately 5% in men older than 65 years.⁵ Among older patients residing in long-term care facilities, up to 50% of female residents and up to 40% of male residents have ASB.⁸ These findings, in part, created the common perception of causation between UTI and delirium.

WHY YOU SHOULD NOT OBTAIN URINE TESTING IN OLDER ADULTS WITH DELIRIUM IF THEY HAVE NO SIGNS OR SYMPTOMS OF URINARY TRACT INFECTION

A recent systematic review demonstrated that there is insufficient evidence to associate UTI with acute confusion in older patients.⁹ The Centers for Disease Control and Prevention's National Health Safety Network notes that at least one of the following criteria must be present for the diagnosis of UTI in noncatheterized patients: fever (>38 °C), suprapubic tenderness, costovertebral angle tenderness, urinary frequency, urinary urgency, or dysuria.¹⁰ Recent studies have identified that ASB—by definition, without dysuria, frequency, bladder discomfort, or fever—is an unlikely cause of delirium.^{6,11}

The 2019 Infectious Diseases Society of America (IDSA) practice guidelines suggest that clinicians not screen for ASB in older functionally or cognitively impaired patients with no local genitourinary symptoms or other signs of infection. The IDSA acknowledges that the potential adverse outcomes of antimicrobial therapy, including *Clostridioides difficile* infection,

increased antimicrobial resistance, or adverse drug effects, outweigh the potential benefit of treatment given the absence of evidence that such treatment improves outcomes for this vulnerable patient population (strong recommendation, very low-quality evidence).¹² Per the IDSA guidelines, recommendations are strong when there is “moderate- or high-quality evidence that the desirable consequences outweigh the undesirable consequences for a course of action” and “may also be strong when there is high-quality evidence of harm and benefits are uncertain (ie, low or very low quality),” as in this case scenario. Studies of older institutionalized and hospitalized patients have found that ASB often results in inappropriate antimicrobial use with limited benefit.^{7,13,14} In addition to noting the lack of benefit from treatment, these studies have found that these patients treated with antimicrobials have worse outcomes when compared to untreated patients with ASB. One study of hospitalized patients treated for ASB concluded that participants given antimicrobial agents experienced longer durations of hospitalization, with no benefits from treatment.¹³ Moreover, another study identified poor long-term functional recovery in patients treated for ASB.¹⁴

Overtreatment also has public health implications given that it may increase the prevalence of multidrug-resistant bacteria in long-term care facilities.¹⁵ One recent study of nursing home residents demonstrated an association between bacteriuria, increased antibiotic use, and subsequent isolation of multidrug-resistant gram-negative organisms.¹⁶ The increased prevalence of these organisms limits options for oral antibiotic therapies in the outpatient setting, potentially leading to increased healthcare utilization and further harms relating to institutionalization in this vulnerable patient population. In light of the ethical concept of nonmaleficence, recognizing the potential harms of treating ASB without clear benefit is important for clinicians to take into account when considering urinalysis in this patient population.

In addition, obtaining a urine culture in an older patient with no signs or symptoms of UTI may lead to premature closure from a diagnostic perspective, resulting in missed diagnoses during clinical evaluation. A missed alternative diagnosis could then cause additional, ongoing harm to the patient if left untreated. Subsequent harms from delayed treatment can thus compound the direct harms and added costs incurred by inappropriate testing and treatment of patients with delirium.

Since 2013, the American Geriatrics Society (AGS) has recommended against the use of antimicrobials in older patients with no urinary tract symptoms, stating that “Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects.”¹⁷ The IDSA practice guidelines state the following: “In older patients with functional and/or cognitive impairment with bacteriuria and delirium (acute mental status change, confusion) and without local genitourinary symptoms or other systemic signs of infection (eg, fever or hemodynamic instability), we recommend assessment for other causes and careful observation rather than antimicrobial treatment (strong recommendation, very low-quality evidence).”¹²

WHEN YOU SHOULD OBTAIN URINALYSIS FOR OLDER ADULTS WITH DELIRIUM

Older patients presenting with confusion in the setting of recognized symptoms of UTI (eg, acute dysuria, urinary urgency or frequency) warrant urinalysis and urine culture. Additionally, urinalysis and urine cultures may be warranted to assess for UTI—even in the absence of a localizing source—in older patients with signs and symptoms of delirium who also exhibit systemic signs of infection (eg, fever, leukocytosis, hemodynamic instability).¹²

WHAT YOU SHOULD DO INSTEAD

Initial evaluation of an older patient with delirium should include a thorough review of their recent history and baseline mental status with a knowledgeable informant, a careful physical and neurologic examination, and laboratory studies to determine the presence of electrolyte or metabolic derangements as well as infection and organ failure.⁴ Clinicians should take into account nonmodifiable risk factors for delirium and conduct a careful review of the time course of changes in mental status and modifiable risk factors, including environment, sleep deprivation, medications, immobilization, and sensory impairments.¹⁸

To manage delirium in older patients, clinicians should identify reversible causes of the delirium and minimize modifiable exacerbating factors (eg, sensory impairment, sleep deprivation) in the immediate environment of the patient. They should also carefully review medications that may contribute to delirium, using tools such as the AGS Beers Criteria to identify high-risk medications and concerning medication combinations.¹⁹ Patients who develop local or systemic signs of infection (ie, fevers, chills, dysuria) should undergo appropriate testing, including urinalysis if there is clinical suspicion for urinary etiology.

RECOMMENDATIONS

- For older patients presenting with delirium without localized urinary symptoms or systemic signs of a serious infection, forgo routine ordering of urinalysis and urine culture.
- For older patients presenting with delirium and localized or systemic signs of infection, routine urine studies and antimicrobial therapy may be appropriate.
- For older patients presenting with delirium without localized symptoms or systemic signs of serious infection, attempt to first identify the cause of the change in mental status by obtaining history from a reliable informant, performing a thorough physical and neurologic examination, and evaluating for metabolic and electrolyte derangements.

CONCLUSION

Returning to the clinical scenario, older patients presenting with signs and symptoms of delirium should undergo further work-up to determine underlying causes for their altered mental status. The patient’s history, ideally obtained from a knowledgeable informant, should offer insight into her base-

line mental status and risk factors for delirium. This should be followed by a careful physical and neurologic examination, and evaluation for electrolyte, metabolic, and other derangements. In patients without localized or systemic signs of infection, routine urine testing and treatment of bacteriuria should be avoided.

Do you think this is a low-value practice? Is this truly a “Thing We Do for No Reason™”? Share what you do in your practice and join in the conversation online by retweeting it on Twitter (#TWDFNR) and liking it on Facebook. We invite you to propose ideas for other “Things We Do for No Reason™” topics by emailing TWDFNR@hospitalmedicine.org

Disclosures: The authors have no conflicts to disclose.

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