

Commentary

Is the BLADDER score the “boost” we need?

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Suspected urinary tract infection (UTI) is the most common reason that nursing home residents receive antibiotics. Unfortunately, many of these antibiotics are suboptimal—either the wrong antibiotic, dose, or duration—or the antibiotic was never indicated in the first place. The decision to initiate an antibiotic for a presumed UTI is complex, relying on careful consideration of signs and symptoms of UTI combined with test results. In the older, more frail population, obtaining a history to determine if UTI symptoms are present can be difficult, muddled by several factors, including underlying pathology (eg, chronic urinary incontinence, benign prostate hyperplasia) and baseline cognitive impairment (eg, dementia) associated with an increased propensity to develop altered mental status and behavioral changes in response to a variety of non-genitourinary disorders (eg, mild dehydration or side effects of medications). Furthermore, the high prevalence of chronic bacteriuria in this patient population may lead to overinterpretation of positive urine culture results when other aspects of clinical presentation are ambiguous. Consequently, diagnostic stewardship interventions focused on improving the rationale for ordering urine cultures may help decrease antibiotic prescribing for asymptomatic bacteriuria (ASB) in this patient population.^{1,2}

With the same goal of improving antibiotic prescribing for UTIs, Langford *et al* developed and implemented a stewardship intervention targeting the decision-making process around ordering urine cultures in a continuing care and rehabilitation hospital in Canada.³ The patient population in this center consisted of older adults, similar to nursing homes in the United States. Their intervention relied upon a clever mnemonic—the BLADDER score—developed to help clinicians remember the minimum requirement of UTI-specific symptoms necessary before ordering a urine culture. The introduction of the BLADDER score was associated with an overall decrease in urine culture orders (from 12.47 to 7.92 per 1,000 patient days), although the rate of decrease before and after implementation was similar. Importantly, urinary antibiotic use decreased from 40.5 defined daily doses (DDD) per 1,000 patient days to 30.0 DDD per 1,000 patient days, with an increase in rate of decline after implementation. When evaluating for balancing measures, implementation of the BLADDER score was not associated with increased transfers to acute care or mortality.

Although the BLADDER score is novel, it is anchored in the well-established Loeb Minimum Criteria.⁴ Now over 20 years old,

the Loeb Minimum Criteria used an expert panel to reach a consensus on the minimum criteria necessary to initiate antibiotics to treat infections common to long-term care facility residents. The criteria, which are well-accepted and familiar to practitioners working in nursing homes, are based on signs and symptoms, rather than the results of diagnostic tests. The authors gave Loeb a makeover, packaging it into an easy-to-remember mnemonic where a score of 2 should prompt testing (Table 1). Clinicians are well-acquainted with mnemonics across medicine, such as CHADS₂VASC for anticoagulation for atrial fibrillation or APGAR for assessment of newborns. The BLADDER acronym has the added benefit of referring to the infected organ.

Stewardship interventions often focus directly on antimicrobial use, yet the results of diagnostic tests also drive inappropriate antimicrobial prescribing. Clinicians often use diagnostic test results to refine differential diagnoses and determine clinical management, including antibiotics. In fact, ordering the appropriate cultures and reviewing their results are key components of two of the four moments of antibiotic decision-making in long-term care.⁵ The utility of cultures, however, relies on the pretest probability of a true UTI being present. This is especially true with urine cultures in nursing home residents, who have high rates of ASB.⁶ In the acute care setting, diagnostic stewardship interventions have been associated with a greater reduction in the treatment of ASB than antibiotic stewardship interventions.⁷

Many stewardship interventions can be described as “nudges”—an externally applied intervention that subtly guides behavior without removing choices. An example of a nudge-based intervention is peer comparison reports. These reports show clinicians how their prescribing practices compare to their peers after the fact, with the goal of encouraging clinicians to “perform better” based on their desire to cooperate. Although nudge interventions are successful, they often come across to the clinicians as controlling and diminishing prescribing autonomy. Furthermore, their beneficial effects can decay over time without continuous reinforcement.⁸ Nudges may run the risk of their targets feeling scrutinized or penalized. This in turn undermines efforts to encourage clinicians to integrate principles of antibiotic stewardship into their daily practice patterns.

Langford *et al* integrated a different behavioral intervention—a boost—into their intervention. Similar to nudges, boosts do not coerce or take away choices. Rather than subtly manipulating behavior through environmental or system changes, however, boosts support sustainable behavior change by engaging individuals’ competencies and supporting their agency to make informed choices.⁹ Simply stated, boosts empower.

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Table 1. Comparison of the Loeb Minimum Criteria and the BLADDER score for adults without an indwelling urinary catheter

| Loeb minimum criteria | BLADDER score | |
|--|--|----------|
| Dysuria alone | Dysuria | 2 points |
| or | | |
| Fever (>37.9°C [100°F] or 1.5°C [2.4°F]) increase above baseline AND ≥1 new or worsening localizing signs and symptoms: | Elevated temperature (fever >38°C) | 1 point |
| Urgency | | |
| Frequency | Repeated urination (frequency) | 1 point |
| Suprapubic pain | Abdominal or suprapubic pain | 1 point |
| Gross hematuria | Blood in urine | 1 point |
| Costovertebral angle tenderness | | |
| Urinary incontinence | Loss of urinary control (incontinence) | 1 point |

The BLADDER score boosts engagement in antimicrobial stewardship by supporting the integration of relevant clinical information into a numeric value that practitioners can use to guide their choice of whether or not to order urine studies. As a tool, the BLADDER score is transparent and easy to apply and promotes a shared framework based on the clear intention of improving antimicrobial use. Boost interventions require a large implementation lift because although boosts maintain clinician autonomy, they also require clinician buy-in. The described implementation of the BLADDER score was well thought out and deliberate and likely rooted in a strong culture of patient safety. In the nursing home setting, this expanded beyond prescribers and aptly included nurses and therapists, who are often the first to note a change in a resident's condition and request urine cultures. The research group targeted team huddles of these staff members as well as patients and their families. Following their go-live, the group continued to meet with the staff and used point prevalence audits of BLADDER score adherence at both the ward and provider level as a nudge to promote continued use. Although these activities are more time and resource intensive than simply launching the use of the score, the combination of these activities is what ultimately promotes a culture in which orders for urine cultures are placed, not as part of a "shotgun" response but rather as part of a thoughtful, deliberate diagnostic evaluation driven by signs and symptoms specific to the genitourinary tract. Cultural change typically heralds sustainability.

With continued examples of the benefits of diagnostic stewardship, perhaps the BLADDER score is ready for expanded use. Langford *et al* provide a clear description of their implementation framework that could be adapted to other long-term care facilities in Canada and the United States. The next frontier beyond that might be an expansion of these boosting mnemonics into clinical decision support tools in emergency departments and from there, across the continuum of care.

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