Clinical Infectious Diseases

IDSA FEATURES

Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America[a]

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Asymptomatic bacteriuria (ASB) is a common finding in many populations, including healthy women and persons with underlying urologic abnormalities. The 2005 guideline from the Infectious Diseases Society of America recommended that ASB should be screened for and treated only in pregnant women or in an individual prior to undergoing invasive urologic procedures. Treatment was not recommended for healthy women; older women or men; or persons with diabetes, indwelling catheters, or spinal cord injury. The guideline did not address children and some adult populations, including patients with neutropenia, solid organ transplants, and nonurologic surgery. In the years since the publication of the guideline, further information relevant to ASB has become available. In addition, antimicrobial treatment of ASB has been recognized as an important contributor to inappropriate antimicrobial use, which promotes emergence of antimicrobial resistance. The current guideline updates the recommendations of the 2005 guideline, includes new recommendations for populations not previously addressed, and, where relevant, addresses the interpretation of nonlocalizing clinical symptoms in populations with a high prevalence of ASB.

Keywords. asymptomatic bacteriuria; bacteriuria; urinary tract infection; pyelonephritis; cystitis; diabetes; pregnancy; renal transplant; endourologic surgery; urologic devices; urinary catheter; older adults; nursing home; long-term care; spinal cord injury; neurogenic bladder.

Received 29 November 2018; editorial decision 20 December 2018; accepted 27 December 2018; published online March 21, 2019.

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Clinical Infectious Diseases® 2019;68(10):1611–5

DOI: 10.1093/cid/ciz021

EXECUTIVE SUMMARY

Asymptomatic bacteriuria (ASB) is the presence of 1 or more species of bacteria growing in the urine at specified quantitative counts ($\geq 10^5$ colony-forming units [CFU]/mL or $\geq 10^8$ CFU/L), irrespective of the presence of pyuria, in the absence of signs or symptoms attributable to urinary tract infection (UTI). ASB is a common finding in some healthy female populations and in many women or men with abnormalities of the genitourinary tract that impair voiding. In 2005, the Infectious Diseases Society of America (IDSA) published a guideline with recommendations for the management of ASB in adults. The current guideline reviews and updates the 2005 guideline, incorporating new evidence that has become available. The recommendations also consider populations not addressed in the 2005 guidelines, such as children and

patients with solid organ transplants (SOTs) or neutropenia. Since the previous guideline was published, antimicrobial stewardship programs have identified nontreatment of ASB as an important opportunity for decreasing inappropriate antimicrobial use. Nonlocalizing signs and symptoms are common in individuals in some populations with a high prevalence of ASB and may lead to clinical uncertainty in the diagnosis of symptomatic infection. This may compromise the implementation of nontreatment recommendations. Thus, this updated guideline also addresses the clinical presentation of symptomatic UTI in populations where there is a high prevalence of ASB, such as patients with spinal cord injury or older adults (≥65 years of age). Candiduria is not addressed, as recommendations for management of this syndrome were included in the recent update of the IDSA Clinical Practice Guidelines for the Management of Candidiasis. The panel followed a process used in the development of other IDSA guidelines, which included a systematic weighting of the strength of recommendation and quality of evidence using Grading of Recommendations Assessment, Development and Evaluation (GRADE) (Figure 1) [1–5].

Summarized below are the 2019 revised recommendations for the management of ASB in adults and children. The guidelines are not intended to replace clinical judgment in the management of individual patients. A detailed description of the methods, background, and evidence summaries that support each recommendation can be found in the full text of the guideline.

RECOMMENDATIONS FOR ASYMPTOMATIC BACTERIURIA

I. Should ASB Be Screened for or Treated in Pediatric Patients?

Recommendation

1. In infants and children, we recommend against screening for or treating ASB (*strong recommendation, low-quality evidence*).

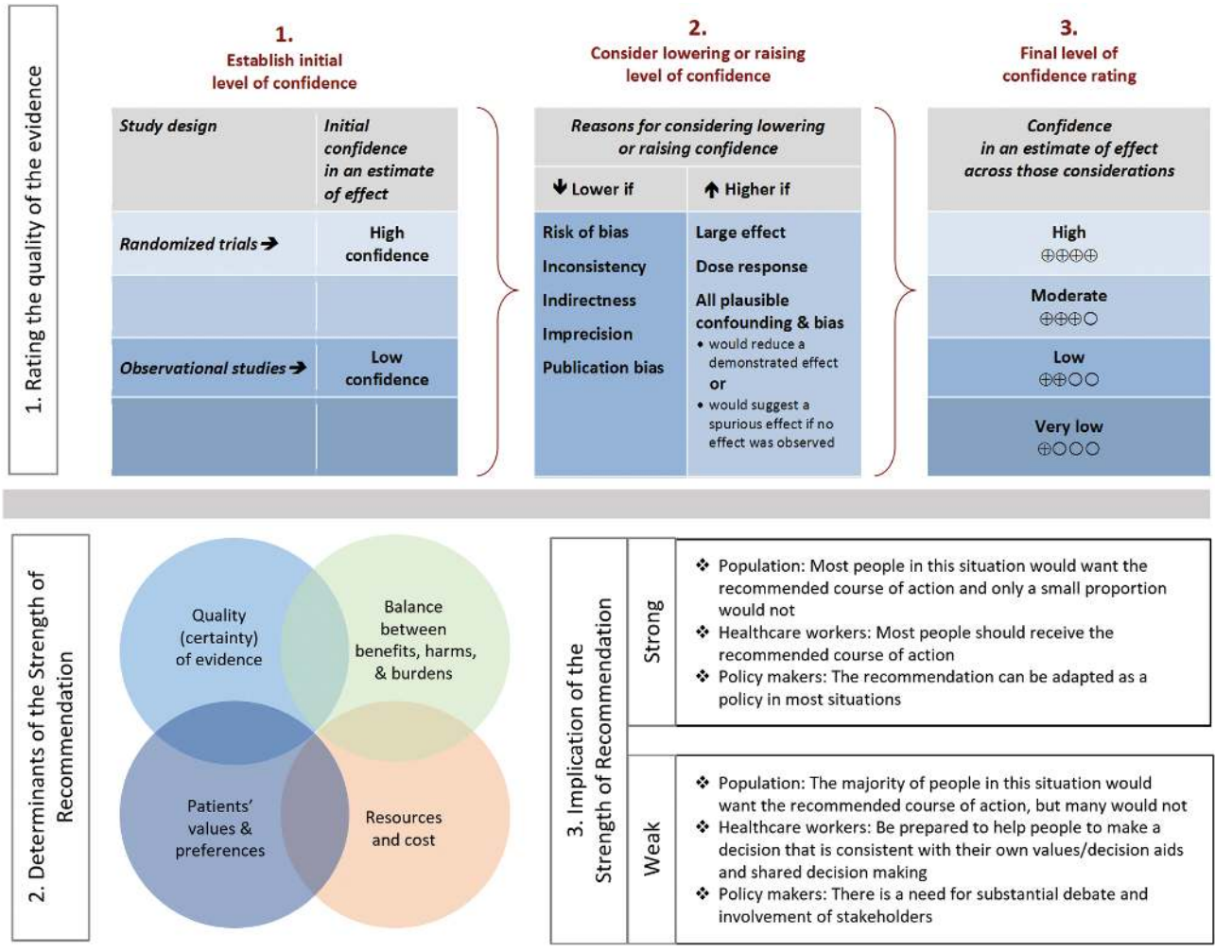

Figure 1. Approach and implications to rating the quality of evidence and strength of recommendations using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) methodology (unrestricted use of the figure granted by the US GRADE Network).

II. Should ASB Be Screened for or Treated in Healthy Nonpregnant Women?

Recommendation

1. In healthy premenopausal, nonpregnant women or healthy postmenopausal women, we recommend against screening for or treating ASB (*strong recommendation, moderate-quality evidence*).

III. Should ASB Be Screened for or Treated in Pregnant Women?

Recommendations

1. In pregnant women, we recommend screening for and treating ASB (*strong recommendation, moderate-quality evidence*). **Remarks:** A recent study in the Netherlands suggested that nontreatment of ASB may be an acceptable option for selected low-risk women. However, the committee felt that further evaluation in other populations was necessary to confirm the generalizability of this observation. We suggest a urine culture collected at 1 of the initial visits early in pregnancy. There is insufficient evidence to inform a recommendation for or against repeat screening during the pregnancy for a woman with an initial negative screening culture or following treatment of an initial episode of ASB.
2. In pregnant women with ASB, we suggest 4–7 days of antimicrobial treatment rather than a shorter duration (*weak recommendation, low-quality evidence*). **Remarks:** The optimal duration of therapy will vary depending on the antimicrobial given; the shortest effective course should be used.

IV. Should ASB Be Screened for or Treated in Functionally Impaired Older Women or Men Residing in the Community, or in Older Residents of Long-term Care Facilities?

Recommendations

1. In older, community-dwelling persons who are functionally impaired, we recommend against screening for or treating ASB (*strong recommendation, low-quality evidence*).
2. In older persons resident in long-term care facilities, we recommend against screening for or treating ASB (*strong recommendation, moderate-quality evidence*).

V. In an Older, Functionally or Cognitively Impaired Patient, Which Nonlocalizing Symptoms Distinguish ASB From Symptomatic UTI?

Recommendations

1. 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*).
2. In older patients with functional and/or cognitive impairment with bacteriuria and without local genitourinary symptoms or other systemic signs of infection (fever, hemodynamic instability) who experience a fall, we recommend assessment for other causes and careful observation rather than antimicrobial treatment of bacteriuria (*strong recommendation, very low-quality evidence*). **Values and preferences:** This recommendation places a high value on avoiding adverse outcomes of antimicrobial therapy such as *Clostridioides difficile* infection, increased antimicrobial resistance, or adverse drug effects, in the absence of evidence that such treatment is beneficial for this vulnerable population. **Remarks:** For the bacteriuric patient with fever and other systemic signs potentially consistent with a severe infection (sepsis) and without a localizing source, broad-spectrum antimicrobial therapy directed against urinary and nonurinary sources should be initiated.

VI. Should Diabetic Patients Be Screened or Treated for ASB?

Recommendation

1. In patients with diabetes, we recommend against screening for or treating ASB (*strong recommendation, moderate-quality evidence*). **Remarks:** The recommendation for nontreatment of men is inferred from observations in studies that have primarily enrolled women.

VII. Should Patients Who Have Received a Kidney Transplant Be Screened or Treated for ASB?

Recommendation

1. In renal transplant recipients who have had renal transplant surgery >1 month prior, we recommend against screening for or treating ASB (*strong recommendation, high-quality evidence*). **Remarks:** There is insufficient evidence to inform a recommendation for or against screening or treatment of ASB within the first month following renal transplantation.

VIII. Should Patients Who Have Received a Solid Organ Transplant Other Than a Renal Transplant Be Screened or Treated for ASB?

Recommendation

1. In patients with nonrenal SOT, we recommend against screening for or treating ASB (*strong recommendation, moderate-quality evidence*). **Values and preferences:** This recommendation places a high value on avoidance of antimicrobial use so as to limit the acquisition of antimicrobial-resistant organisms or *Clostridioides difficile* infection in SOT patients, who are at increased risk for these adverse outcomes. **Remarks:** In nonrenal SOT recipients, symptomatic UTI is uncommon and adverse consequences of symptomatic UTI are extremely rare; the risk of complications from ASB is, therefore, probably negligible.

IX. Should Patients With Neutropenia Be Screened or Treated for ASB?

Recommendation

1. In patients with high-risk neutropenia (absolute neutrophil count <100 cells/mm^3, ≥7 days' duration following chemotherapy), we make no recommendation for or against screening for or treatment of ASB (knowledge gap). **Remarks:**

For patients with high-risk neutropenia managed with current standards of care, including prophylactic antimicrobial therapy and prompt initiation of antimicrobial therapy when febrile illness occurs, it is unclear how frequently ASB occurs and how often it progresses to symptomatic UTI. Patients with low-risk neutropenia (>100 cells/mm^3, ≤7 days, clinically stable) have only a very small risk of infection and there is no evidence to suggest that, in this population, ASB has greater risk than for nonneutropenic populations.

X. Should ASB Be Screened for or Treated in Individuals With Impaired Voiding Following Spinal Cord Injury?

Recommendation

1. In patients with spinal cord injury, we recommend against screening for or treating ASB (*strong recommendation, low-quality evidence*). **Remarks:** Clinical signs and symptoms of UTI experienced by patients with spinal cord injury may differ from the classic genitourinary symptoms experienced by patients with normal sensation. The atypical presentation of UTI in these patients should be considered in making decisions with respect to treatment or nontreatment of bacteriuria.

XI. Should Patients With an Indwelling Urethral Catheter Be Screened or Treated for ASB?

Recommendations

1. In patients with a short-term indwelling urethral catheter (<30 days), we recommend against screening for or treating ASB (*strong recommendation, low-quality evidence*). **Remarks:** Considerations are likely to be similar for patients with indwelling suprapubic catheters, and it is reasonable to manage these patients similar to patients with indwelling urethral catheters, for both short-term and long-term suprapubic catheterization.
2. In patients with indwelling catheters, we make no recommendation for or against screening for and treating ASB at the time of catheter removal (knowledge gap). **Remarks:** Antimicrobial prophylaxis given at the time of catheter removal may confer a benefit for prevention of symptomatic UTI for some patients. The evidence to support this observation is largely from studies enrolling surgical patients who receive prophylactic antimicrobials at the time of short-term catheter removal, generally without screening to determine if ASB is present. It is unclear whether or not the benefit is greater in patients with ASB.
3. In patients with long-term indwelling catheters, we recommend against screening for or treating ASB (*strong recommendation, low-quality evidence*).

XII. Should Patients Undergoing Elective Nonurologic Surgery Be Screened or Treated for ASB?

Recommendation

1. In patients undergoing elective nonurologic surgery, we recommend against screening for or treating ASB (*strong recommendation, low-quality evidence*).

XIII. Should Patients Undergoing Endourological Procedures Be Screened or Treated for ASB?

Recommendations

1. In patients who will undergo endoscopic urologic procedures associated with mucosal trauma, we recommend screening for and treating ASB prior to surgery (*strong recommendation, moderate-quality evidence*). **Values and preferences:** This recommendation places a high value on the avoidance of the serious postoperative complication of sepsis, which is a substantial risk for patients undergoing invasive endourologic procedures in the presence of bacteriuria. **Remarks:** In individuals with bacteriuria, these are procedures in a heavily contaminated surgical field. High-quality evidence from other surgical procedures shows that perioperative antimicrobial treatment or prophylaxis for contaminated or clean-contaminated procedures confers important benefits.
2. In patients who will undergo endoscopic urologic procedures, we suggest that a urine culture be obtained prior to the procedure and targeted antimicrobial therapy prescribed rather than empiric therapy (*weak recommendation, very low-quality evidence*).
3. In patients with ASB who will undergo a urologic procedure, we suggest a short course (1 or 2 doses) rather than more prolonged antimicrobial therapy (*weak recommendation, low-quality evidence*). **Remarks:** Antimicrobial therapy should be initiated 30–60 minutes before the procedure.

XIV. Should Patients Undergoing Implantation of Urologic Devices or Living With Urologic Devices Be Screened or Treated for ASB?

Recommendations

1. In patients planning to undergo surgery for an artificial urine sphincter or penile prosthesis implantation, we suggest not screening for or treating ASB (*weak recommendation, very low-quality evidence*). **Remarks:** All patients should receive standard perioperative antimicrobial prophylaxis prior to device implantation.
2. In patients living with implanted urologic devices, we suggest not screening for or treating ASB (*weak recommendation, very low-quality evidence*).

Notes

Acknowledgments. The expert panel expresses its gratitude for thoughtful reviews of an earlier version by Drs Florian Wagenlehner, James R. Johnson, and Ann Stapleton. The panel thanks the Infectious Diseases Society of America (IDSA) for supporting guideline development, and specifically Vita Washington and Rebecca Goldwater for their continued support throughout the guideline process. The panel expresses its gratitude for librarian Shandra Knight for continued literature support throughout the development of the guideline.

Financial support. Support for these guidelines was provided by the Infectious Diseases Society of America.

Potential conflicts of interest. The following list is a reflection of what has been reported to the IDSA. To provide thorough transparency, the IDSA requires full disclosure of all relationships, regardless of relevancy to the guideline topic. Evaluation of such relationships as

potential conflicts of interest is determined by a review process that includes assessment by the Standards and Practice Guideline Committee (SPGC) Chair, the SPGC liaison to the development panel and the Board of Directors liaison to the SPGC, and if necessary, the Conflicts of Interests (COI) Task Force of the Board. This assessment of disclosed relationships for possible COI will be based on the relative weight of the financial relationship (ie, monetary amount) and the relevance of the relationship (ie, the degree to which an association might reasonably be interpreted by an independent observer as related to the topic or recommendation of consideration). The reader of these guidelines should be mindful of this when the list of disclosures is reviewed. S. F. B. has received research grants from the National Institutes of Health (NIH), the Veterans Affairs (VA) Cooperative Studies Program, the VA Health Services Research and Development Service (HSR&D)/CREATE, the VA/Centers for Disease Control and Prevention (CDC) Network, and Pfizer. D. D. has served as a consultant for Tetraphase and received research grants from VA Clinical Science Research and Development Merit Review, and the VA Cooperative Studies Program. K. G. has served as a consultant for Paratek, Ocean Spray, Iterum, and Tetraphase and has received other remuneration from UpToDate. S. G. has served as a consultant for Nordic Pharma. T. M. H. has served as a consultant for Damone, Melnata, Melinta OM Pharma, GlaxoSmithKline (GSK), Ocean Spray, Paratek, Shionogi, Achaogen, and Cubist; has ownership interest in Fimbrion Therapeutics; and has received other remuneration from Fimbrion Therapeutics and UpToDate. M. J. M. has received research grants from the NIH and has served as a consultant to Iterum Therapeutics. B. K. has received research grants from the European Association of Urology and served as a consultant for F. Hoffmann-La Roche Ltd. L. N. has served as a consultant for Paratek, Tetraphase, Utility, and GSK. R. S. is a member of the GRADE Working Group. S. S. has received research grants and contracts from the Department of Veterans Affairs, American Hospital Association, European Commission, NIH, CDC, and Agency for Healthcare Research and Quality (AHRQ); has received honoraria from Doximity and numerous individual hospitals and nonprofit organizations to discuss infection prevention, leadership, and patient safety; has ownership interest in Doximity and Jvion; and has a patent pending. B. T. has received research grants from VA HSR&D, AHRQ, CDC, NIH, and Zambon Pharmaceuticals, and one-time consulting fees from Paratek and Zambon Pharmaceuticals. B. W. has received research grants from Vifor; has served as a consultant for Vifor, Bionorica, and Leo Pharma; and has received honoraria from Vifor, Binorica, Astellas, and Leo Pharma. All other authors report no potential conflicts. All 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. Guyatt GH, Oxman AD, Vist GE, et al; GRADE Working Group. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. BMJ **2008**; 336:924–6.
2. Jaeschke R, Guyatt GH, Dellinger P, et al; GRADE Working Group. Use of GRADE grid to reach decisions on clinical practice guidelines when consensus is elusive. BMJ **2008**; 337:a744.
3. Schünemann HJ, Oxman AD, Brozek J, et al. GRADE: assessing the quality of evidence for diagnostic recommendations. Evid Based Med **2008**; 13:162–3.
4. Guyatt GH, Oxman AD, Kunz R, Vist GE, Falck-Ytter Y, Schünemann HJ; GRADE Working Group. What is "quality of evidence" and why is it important to clinicians? BMJ **2008**; 336:995–8.
5. Guyatt GH, Oxman AD, Kunz R, et al; GRADE Working Group. Going from evidence to recommendations. BMJ **2008**; 336:1049–51.