Asymptomatic Bacteriuria

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JOURNAL ARTICLE

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

Lindsay E Nicolle ✉, Kalpana Gupta, Suzanne F Bradley, Richard Colgan, Gregory P DeMuri, Dimitri Drekonja, Linda O Eckert, Suzanne E Geerlings, Béla Köves, Thomas M Hooton ... Show more

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ASB: Definition

Presence of 1 or more species of bacteria in significant count in the absence of signs or symptoms attributable to urinary tract infection (UTI).
Irrespective of the presence of pyuria

cid 2019:68 (15 May) Nicolle et al

ASB

- Women with voided sample 105 -108 cfu/ml

(done twice within 2 weeks)

- Men voided sample 105 once
- Catheterized patient same
- Catheter collection of urine 102-105

Symptoms

Dysuria

Frequency

Urgency

Suprapubic pain

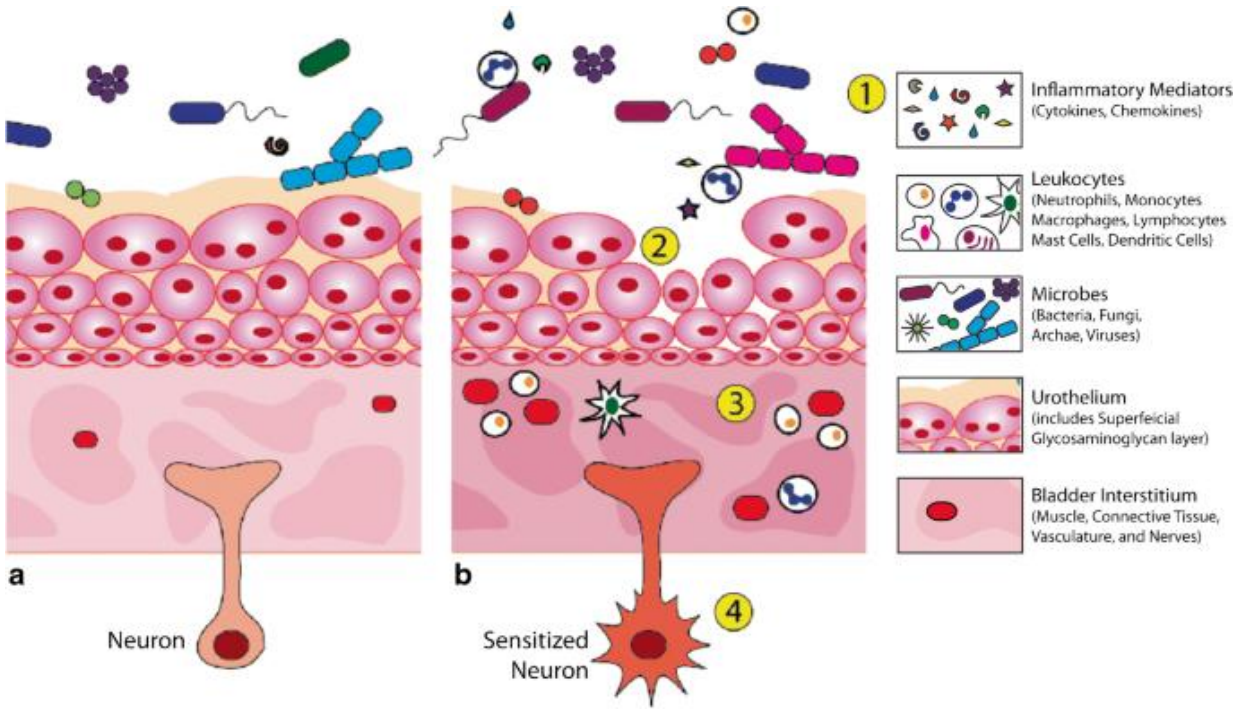
Hematuria

CV angle pain or tenderness

Fever, chills with or without any of the above

Human as Habitat Model

- Evolving understanding of the urinary microbiome: Commensal organisms live in harmony with human hosts on bodily surfaces and bodily organs
- Individuals host a complex microbial community important in the maintenance of normal bladder function
- “Urine is not sterile”
- “Urinary bacteria are the rule not the exception”



Ackerman, A.L., Chai, T.C. The Bladder is Not Sterile: an Update on the Urinary Microbiome. *Curr Bladder Dysfunct Rep* 14, 331–341 (2019).

Please don’t confuse it with the world-wide all-consuming pandemic of CONTAMINATED COLLECTIONS

that preceded H1N1, alive and well during COVID era and isn't ever going away unless we bring about a revolution.

Look at epithelial cells first followed by WBC

Contaminated collection

- Pus cells 20/hpf
- Epithelial cells 8/hpf
- Bacteria +

E coli 10,000 cfu

GpB Strep 10,000 cfu/ml

ASB or UTI

- Pus cells 60/hpf
- Epithelial cells 1/hpf
- Bacteria +

- Ecoli 100,000 cfu/ml

Lets Define

23 year old female comes with acute onset of dysuria, frequency, urgency.

48 year old diabetic comes with acute onset of fever, shaking chills, left flank pain.

A 76 year is in your office for a routine visit for HTN, Hyperlipidemia and reports urine that has smell and is cloudy.

ASB (asymptomatic bacteriuria) represents presence of UTI causing bacteria in the urine and no symptoms of UTI. This is usually seen when there is incomplete emptying of bladder or presence of an indwelling catheter. Presence of WBCs in the urine at the same time does not make it UTI in absence of symptoms.

Patients with ASB may be at a higher risk of getting a symptomatic UTI. However, in absence of symptoms, no antibiotics are recommended to be used. Its use for ASB can lead to antibiotic-related diarrhea, C. difficile colitis and other adverse reactions from antibiotic and can also SB. Using antibiotics will clear the bacteria, however it will not decrease the chances of getting a symptomatic UTI. Instead, it will select out for more resistant bacteria in gut. Antibiotics disrupt the normal bacterial flora in your gut and elsewhere.

ASB

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.

ASB

Commonly misdiagnosed as a UTI especially in the elderly population, patients with voiding issues and different degrees of urinary retention and indwelling catheters.

¾ patient hospitalized patients with ASB receive antibiotics inappropriately in certain states (Michigan).

Prevalence of Asymptomatic Bacteriuria Reported for Different Populations

Population	Prevalence, %
Children	
Boys	<1
Girls	1–2
Healthy women	
Premenopausal	1.0–5.0
Pregnant	1.9–9.5
Postmenopausal (age 50–70 y)	2.8–8.6
Persons with diabetes	
Women	10.8–16
Men	0.7–11
Elderly persons in the community (age ≥70 y)	
Women	10.8–16
Men	3.6–19

Nicolle et al. 2018 Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria: 2019 Update by the Infectious Diseases Society of America

. **Prevalence of Asymptomatic Bacteriuria Reported for Different Populations**

Persons with spinal cord injury	
Intermittent catheter use	23–69
Sphincterotomy/condom catheter	57
Persons with kidney transplant	
First month posttransplant	23–24
1 mo–1 y post-transplant	10–17
>1 y post-transplant	2–9
Persons with indwelling catheter use	
Short-term	3%–5%/day catheter
Long-term	100

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Pyuria is present with asymptomatic bacteriuria

- 32% of young women
- 30%–70% of pregnant women
- 70% of diabetic women
- 90% of elderly institutionalized patients
- 90% of hemodialysis patients
- 30%–75% of bacteriuric patients with short-term catheters
- 50%–100% of individuals with long-term indwelling catheters

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Two Topics of Interest

- Is asymptomatic bacteriuria associated with adverse outcomes.

- Do the interventions of screening and antimicrobial treatment improve these outcomes.

Outcomes Of Interest

Short term

- Symptomatic urinary infection (including bacteremia with sepsis or worsening functional status)

Longer term

- Progression to chronic kidney disease
- Hypertension.
- Development of urinary tract cancer.
- Decreased duration of survival.

ASB

- The association of ASB with symptomatic UTI is attributable to host factors that promote both symptomatic and asymptomatic infection rather than ASB leading to Symptomatic UTI.

Screening of asymptomatic subjects for bacteriuria is appropriate if bacteriuria has adverse outcomes that can be prevented by antimicrobial therapy*

If treatment of bacteriuria is not beneficial, screening of asymptomatic populations to identify bacteriuria is not indicated

US Preventive Services Task Force. Screening for asymptomatic bacteriuria. In: Guide to clinical preventive services. 2nd edition. **1996**.

Available at: http://www.ahcpr.gov/clinic/uspstfix.htm. Accessed May 2004

Treatment of ASB neither decreases the frequency of symptomatic infection nor prevents further episodes of ASB

(RCT NEJ

M 1969, NF versus Placebo for 1 week). Lower frequency of bacteriuria at 6 months in NF arm but not at 1 yr. Same frequency of symptomatic UTI after 1 yr

US Preventive Services Task Force. Screening for Asymptomatic Bacteriuria in Adults: US Preventive Services Task Force Recommendation Statement. *JAMA.* 2019;322(12):1188–1194. doi:10.1001

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Pharmacotherapy 2014;34(9):941-60.

NEJM 2002; 47:1576-83

Antibiotics for Asymptomatic Bacteriuria are Harmful

- Asymptomatic bacteriuria (ASB) is a common finding in many populations, including healthy women and persons with underlying urologic abnormalities.

- Treatment not recommended for healthy women; older women or men; or persons with diabetes, indwelling catheters, or spinal cord injury.

Antibiotics for Asymptomatic Bacteriuria are Harmful

- One in every 8 patients treated for ASB experiences antibiotic adverse effects
- As many as one in every 15 patients treated for ASB will experience a preventable *C. difficile* infection
- **Misdiagnosis of "UTI" may result in a delayed or missed true diagnosis**

NEJM 2002; 347:1576-83; Infect Control Hosp Epidemiol 2011; 32 (7):644-48; JAMA Intern Med 2015; 175(3):344-45

- Antimicrobial treatment of ASB has been recognized as an important contributor to inappropriate antimicrobial use, which promotes emergence of antimicrobial resistance.
- Antimicrobial stewardship programs have identified **nontreatment of ASB as an important opportunity for decreasing inappropriate antimicrobial use.**

Increased Harm risk to individual and society

RASH

AKI

C Difficle

AMR horizontal transmission

Candida

ASB

I. Should asymptomatic bacteriuria be screened for and treated in pediatric patients?

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

II. Should ASB be screened for or treated in healthy nonpregnant women ?

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 and treated in pregnant women?

In pregnant women, we recommend screening for and treating ASB

(strong recommendation, moderate-quality evidence)

ASB and pregnancy

- **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.

ASB in Pregnancy: Treatment Duration

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 and treated in functionally impaired older women or men residing in the community, or in older residents of long-term care facilities?

- In older, community-dwelling persons who are functionally impaired, we recommend against screening for or treating ASB

(strong recommendation, low-quality evidence)

- In older persons resident in long-term care facilities, we recommend against screening for or treating ASB

(strong recommendation, moderate-quality evidence)

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V. In an older, functionally or cognitively impaired patient, which non-localizing symptoms distinguish ASB from symptomatic UTI?

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)

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).

Uncertain benefit, harm clear

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

- **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.

Urine Testing for Patients with Mental Status Changes

Change in mental status or fall ONLY symptom

Does patient have one of the following?

- **Hypotension with systolic BP < 90 mmHg**
- **2 or more SIRS criteria**
  - Temperature > 38°C or < 36°C
  - RR > 20 breaths per minute or $PaCO_2$ < 32 mmHg
  - WBC > 12,000 or < 4,000 cells per mm^3 or > 10% bands
  - Tachycardia HR > 90 bpm

Yes → Obtain urinalysis, culture if indicated

No → **Evaluate alternative causes**
Consider: dehydration, new medications, drug interactions, polypharmacy, or medication adverse effects

VI. Should patients with diabetes be screened or treated for ASB?

- 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?

- 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?

In patients with nonrenal solid organ transplant (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?

- 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?

In patients with spinal cord injury (SCI), we recommend against screening for or treating ASB

(strong recommendation, low-quality evidence).

Remarks: Clinical signs and symptoms of UTI experienced by patients with SCI 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?

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

- 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)*.

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.

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 and treated for ASB?

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

exceptions: orthopedic implants

XIII. Should patients undergoing endourological procedures be screened or treated for ASB?

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)*.**

Procedure	Proportion infected postprocedure
Genitourinary surgery	
Transurethral prostatectomy [1]	6–64%
Transurethral procedure with instrumentation for stone extraction [2]	25%
Extracorporeal shock wave lithotripsy (ESWL) [3]	
Negative urine culture before ESWL	1.5%
Positive urine culture before ESWL	21%
Sepsis	4.5%
Catheterization	
Urodynamic studies [4]	1.5–36%
Indwelling catheter [5]	3–7%/day
Intermittent catheterization [6]	4.06/100 patient days

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.

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).

- 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?

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

(weak recommendation, very low-quality evidence).

- In patients living with implanted urologic devices, we suggest not screening for or treating ASB

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True or False

- Urine in a healthy child or adult is sterile
- Presence of significant count of bacteria (100,000 cfu/hpf) in a properly collected (mid-stream clean catch) urine indicates a UTI.
- Contaminated urine collections in not a common problem at all.
- Presence of plenty of pus cells along with significant bacterial count in the urine in a properly collected sample indicates a UTI even in absence of symptoms.

True or False

- Urine in an asymptomatic healthy adult is sterile False
- Presence of significant count of bacteria (100,000 cfu/hpf) in a properly collected (mid-stream clean catch) urine indicates a UTI False
- Contaminated urine collections in not a common problem that muddies the water and confuses the clinicians False
- Presence of plenty of pus cells along with significant bacterial count in the urine in a properly collected sample indicates a UTI even in absence of symptoms False
-

More Questions

- Asymptomatic bacteriuria needs treatment only in pregnancy and before urologic surgery that can result in mucosal bleeding
- Asymptomatic bacteriuria is very common with chronic indwelling foley catheters.
- Its acceptable to send urine sample from a new foley catheter bag placed less than a week ago.
- Its acceptable to transfer urine from a clean and new pot/bedpan for UR and UC.

More Questions

- Asymptomatic bacteriuria needs treatment only in pregnancy and before urologic surgery that can result in mucosal bleeding TRUE
- Asymptomatic bacteriuria is very common with chronic indwelling foley catheters TRUE
- Its acceptable to send urine sample from a new foley catheter bag placed less than a week ago GOSH NOoooooo
- Its acceptable to transfer urine from a clean and new pot/bedpan for UR and UC You better not try that one Grrr

Asymptomatic candiduria

Almost always represents colonization and needs to be treated in the following 3 scenarios

- VLBW infants
- Neutropenic patients
- Before urologic procedures

IDSA practice guidelines management of candidiasis 2016

Stewardship Interventions

- Promote UA with Reflex culture, when UTI suspected. Allows early empiric and would enhance culture yield.
- Do UA and UC in pregnancy and a UC before urologic procedure
- Train your MA/RN to get midstream clean catch if not feasible, a catheter sample
- Educate surgeons that UA and UC not needed before non-urologic surgeries in asymptomatic patients.

Do you really need the dipstick/UA/UC ?

