Geisinger

Geisinger Health Plan Policies and Procedure Manual

Policy: MPA G2156 – Urine Culture Testing for Bacteria

Section: Medical Policy

Subject: Urine Culture Testing for Bacteria

Applicable line of business:

Commercial	**x**	**Medicaid**	**x**
Medicare	**x**	**ACA**	**x**
CHIP	**x**		

I. Policy: Urine Culture Testing for Bacteria

II. Purpose/Objective: To provide a policy of coverage regarding Urine Culture Testing for Bacteria

III. Responsibility:

A. Medical Directors
B. Medical Management

IV. Required Definitions

1. Attachment – a supporting document that is developed and maintained by the policy writer or department requiring/authoring the policy.
2. Exhibit – a supporting document developed and maintained in a department other than the department requiring/authoring the policy.
3. Devised – the date the policy was implemented.
4. Revised – the date of every revision to the policy, including typographical and grammatical changes.
5. Reviewed – the date documenting the annual review if the policy has no revisions necessary.

Commercial

Geisinger Health Plan may refer collectively to health care coverage sponsors Geisinger Health Plan, Geisinger Quality Options, Inc., and Geisinger Indemnity Insurance Company, unless otherwise noted. Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Medicare

Geisinger Gold Medicare Advantage HMO, PPO, and HMO D-SNP plans are offered by Geisinger Health Plan/Geisinger Indemnity Insurance Company, health plans with a Medicare contract. Continued enrollment in Geisinger Gold depends on contract renewal. Geisinger Health Plan/Geisinger Indemnity Insurance Company are part of Geisinger, an integrated health care delivery and coverage organization.

CHIP

Geisinger Health Plan Kids (GHP Kids) is a Children's Health Insurance Program (CHIP) offered by Geisinger Health Plan in conjunction with the Pennsylvania Department of Human Services (DHS). Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Medicaid

Geisinger Health Plan Family (GHP Family) is a Medical Assistance (Medicaid) insurance program offered by Geisinger Health Plan in conjunction with the Pennsylvania Department of Human Services (DHS). Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

V. Additional Definitions
Medical Necessity or Medically Necessary means Covered Services rendered by a Health Care Provider that the Plan determines are:

a. appropriate for the symptoms and diagnosis or treatment of the Member's condition, illness, disease or injury;
b. provided for the diagnosis, and the direct care and treatment of the Member's condition, illness disease or injury;
c. in accordance with current standards of good medical treatment practiced by the general medical community.
d. not primarily for the convenience of the Member, or the Member's Health Care Provider; and

the most appropriate source or level of service that can safely be provided to the Member. When applied to hospitalization, this further means that the Member requires acute care as an inpatient due to the nature of the services rendered or the Member's condition, and the Member cannot receive safe or adequate care as an outpatient

Medicaid Business Segment
Medically Necessary — A service, item, procedure, or level of care that is necessary for the proper treatment or management of an illness, injury, or disability is one that:

- Will, or is reasonably expected to, prevent the onset of an illness, condition, injury or disability.
- Will, or is reasonably expected to, reduce or ameliorate the physical, mental or developmental effects of an illness, condition, injury or disability.
- Will assist the Member to achieve or maintain maximum functional capacity in performing daily activities, taking into account both the functional capacity of the Member and those functional capacities that are appropriate for Members of the same age.

Policy Description

Bacteriuria is the presence of bacteria in the urine. Urinary tract infections (UTIs) can occur in the urinary system and can be either symptomatic or asymptomatic. UTIs can include cystitis, an infection of the bladder or lower urinary tract; pyelonephritis, an infection of the upper urinary tract or kidney; urosepsis; urethritis; and male-specific conditions, such as bacterial prostatitis and epididymitis (Bonkat et al., 2024; Hooton & Gupta, 2023). Typically, in an infected person, bacteriuria, and pyuria (the presence of pus in the urine) are present and can be present in both symptomatic and asymptomatic UTIs. A urine culture can be performed to determine the presence of bacteria and to characterize the bacterial infection (Meyrier, 2024).

For guidance on pathogen panel testing from urine samples, please see AHS-G2149 Pathogen Panel Testing.

Related Policies

Policy Number	Policy Title
AHS-G2149	Pathogen Panel Testing

Indications and/or Limitations of Coverage

Application of coverage criteria is dependent upon an individual's benefit coverage at the time of the request. Specifications pertaining to Medicare and Medicaid can be found in the "Applicable State and Federal Regulations" section of this policy document.

1) For pregnant individuals, urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) for a urinary tract infection (UTI) **MEETS COVERAGE CRITERIA**.
2) For asymptomatic individuals undergoing urological interventions which breach the mucosa, urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) prior to the procedure **MEETS COVERAGE CRITERIA**.

3) For individuals exhibiting at least one sign or symptom of a possible UTI or bacteriuria (see Note 1 below), urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) **MEETS COVERAGE CRITERIA**.
4) To assess pyelonephritis, urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) **MEETS COVERAGE CRITERIA**.
5) For all other instances of asymptomatic UTI or asymptomatic bacteriuria not described above, urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) **DOES NOT MEET COVERAGE CRITERIA**.
6) For individuals that show evidence of clinical resolution of infection, follow-up urine culture testing for an uncomplicated UTI **DOES NOT MEET COVERAGE CRITERIA**.

The following does not meet coverage criteria due to a lack of available published scientific literature confirming that the test(s) is/are required and beneficial for the diagnosis and treatment of an individual's illness.

7) Urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) **DOES NOT MEET COVERAGE CRITERIA** in **any** of the following situations:
   a) As a part of initial screening for asymptomatic prostatitis.
   b) As a part of assessment or prognosis of prostate biopsy.

NOTES:

Note 1: Signs and symptoms of UTI/bacteriuria include (CDC, 2024)

- Fever
- Urgency to urinate
- Feeling the need to urinate despite having an empty bladder
- Increased frequency of urination
- Dysuria
- Suprapubic tenderness
- Pyuria
- Hematuria
- Cloudy urine
- Lower Back and Side (flank) pain
- Nausea
- Vomiting
- Chills
- Night sweats
- Pelvic pressure
- Change in urine smell
- Abnormal urinalysis findings

Table of Terminology

Term	Definition
AAP	American Academy of Pediatrics
ABIM	American Board of Internal Medicine
ABP	Acute bacterial prostatitis
ACOG	American College of Obstetricians and Gynecologists
AMDA	The Society for Post-Acute and Long-Term Care Medicine
ARESC	Antimicrobial Resistance Epidemiological Survey on Cystitis
ASB	Asymptomatic bacteriuria
ASPN	American Society of Pediatric Nephrology
AUA	American Urological Association
AUC	Area under the curve

BP	Bacterial prostatitis
CAUTI	Catheter-associated urinary tract infection
CBP	Chronic bacterial prostatitis
CDC	Centers for Disease Control and Prevention
CFU	Colony-forming unit
CLIA '88	Clinical Laboratory Improvement Amendments of 1988
CMS	Centers For Medicare and Medicaid
CPS	Canadian Paediatric Society
CUA	Canadian Urological Association
cUTI	Complicated urinary tract infection
DNA	Deoxyribonucleic acid
DOR	Diagnostic odds ratio
EAU	European Association of Urology
EQUC	Enhanced quantitative urine culture
FDA	Food and Drug Administration
FUM	Female urinary microbiota
ICU	Intensive care unit
IDSA	Infectious Diseases Society of America
KT	Kidney transplant
LCD	Local coverage determination
LDT	Laboratory-developed test
MRSA	Methicillin-Resistant *Staphylococcus Aureus*
MSSA	Methicillin-Sensitive *Staphylococcus Aureus*
NAAT	Nucleic acid amplification test
NCD	National coverage determination
NICE	National Institute for Health and Care Excellence
NSQIP	National Surgical Quality Improvement Program
OR	Odds ratio
PA	Prior authorization
PCR	Polymerase chain reaction
RNA	Ribonucleic acid
rUTIs	Recurrent urinary tract infection
SCI	Spinal cord injury
SHEA	Society for Healthcare Epidemiology of America
SOT	Solid organ transplant
SPA	Suprapubic aspiration
SSI	Surgical site infection
SUFU	Society Of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction
UA	Urinalysis
USPSTF	United States Preventive Services Task Force
UTI	Urinary tract infection
WHO	World Health Organization

Scientific Background

Urinary tract infections (UTIs) can be either symptomatic or asymptomatic and can be classified as uncomplicated or complicated. Uncomplicated UTIs are "acute, sporadic or recurrent cystitis limited to non-pregnant [individuals] with no known relevant anatomical and functional abnormalities within the urinary tract

or comorbidities" (Bonkat et al., 2024). All other UTIs that are not defined as uncomplicated are complicated UTIs. Complicated UTIs include "UTIs in a patient with an increased chance of a complicated course: i.e. all men, pregnant [individuals], patients with relevant anatomical or functional abnormalities of the urinary tract, indwelling urinary catheters, renal diseases, and/or with other concomitant immunocompromising diseases for example, diabetes" (Bonkat et al., 2024). *Escherichia coli* is the most common cause of complicated UTIs; however, "other uropathogens include other Enterobacteriaceae (such as *Klebsiella* spp and *Proteus* spp), *Pseudomonas*, enterococci, and staphylococci (methicillin-sensitive *Staphylococcus aureus* [MSSA] and methicillin-resistant *S. aureus* [MRSA])" (Hooton & Gupta, 2023). Even though both bacteriuria and pyuria are often present in UTIs, their presence alone is not indicative of a symptomatic infection.

The presence of bacteriuria does not guarantee negative outcomes for a patient. In fact, the paradigm of the sterility of the bladder environment has changed over recent years. At least for females, the presence of female urinary microbiota (FUM) is believed to occur naturally and has been documented using sensitive bacterial DNA screening tests on asymptomatic females (Brubaker & Wolfe, 2016). Beneficial microbes, such as vaginal strains of *Lactobacillus*, can inhibit the grown of uropathogenic bacteria, including *E. coli* (Aroutcheva et al., 2001; Brubaker & Wolfe, 2016). Over-prescribing antibiotics, especially in cases of asymptomatic bacteriuria, can lead to both an eradication of beneficial bacterial flora and an emergence of antibiotic-resistant bacteria. Prescribing antibiotics as a prophylactic measure or in the instance of asymptomatic bacteriuria is detrimental because it is of limited value and can also increase incidences of drug-resistance. A study in 2002 by Harding and colleagues show that antibiotic treatment in diabetic individuals with asymptomatic bacteriuria did not result in a decrease of future symptomatic UTIs as compared to the control group; in fact, the experimental group had higher rates of adverse antimicrobial reactions (Harding et al., 2002). Even though the evidence-based guidelines by various societies, such as the EAU (Bonkat et al., 2024) and SHEA (SHEA, 2019), do not recommend performing urine testing or treatment for asymptomatic bacteriuria, inappropriate treatment is still occurring; in fact, one study by Cope and colleagues show that 32% of catheter-associated cases of asymptomatic bacteriuria and asymptomatic UTI received inappropriate treatment (Cope et al., 2009). The Antimicrobial Resistance Epidemiological Survey on Cystitis (ARESC) shows that up to 10.3% of *E. coli* in UTIs are "resistant to at least three different classes of antimicrobial agents" with ampicillin having the highest degree of resistance (48.3%). This is a large study of 4264 individuals from ten different countries to show that antibiotic-resistance is of international importance (Schito et al., 2009).

Analytical Validity

Urinalysis (UA) to detect nitrite and leukocyte esterase to indicate the presence of bacteria is an accepted laboratory practice. One report, though, has shown that the use of nitrite has "a sensitivity of 3%, a specificity of 97%, and a negative predictive value of 55%" (Cooper et al., 1992). A 2004 meta-analysis study asserts that the "sensitivities of the combination of both tests vary between 68 and 88% in different patient groups, but positive test results have to be confirmed" (Devillé et al., 2004). They did note that the accuracy of the leukocyte esterase testing was higher in urology patients with a diagnostic odds ratio (DOR) of 276 as compared to the accuracy of nitrites (for example, in elderly patients DOR = 108) (Devillé et al., 2004).

Urine culture is considered a "gold standard" for detecting the presence of bacteria in urine (Graham & Galloway, 2001; Schmiemann et al., 2010). That being said, "the interpretation of culture results can be considered as more of an art than a science. A urine culture result depends on so many variables, such as appropriate collection, transport, and the limits of the methods of detection. The reliability of single positive urine culture in diagnosing UTI is only 80%, rising to 90% if a repeat culture shows identical results" (Graham & Galloway, 2001). This is using the definition of bacteriuria as being 10^5 bacteria/ml of urine.

A potential future alternative to the urine culture could be multiplex PCR-based molecular testing, which Wojno et al. (2020) had found to be noninferior to urine culture for detection and identification of the bacteria. Agreement between the two testing methods was 90%, which exceeded the 85% noninferiority threshold. The multiplex PCR was also able to detect bacteria in 36% of symptomatic patients who had negative urine cultures

and detected more polymicrobial infections than urine culture in a shorter amount of time (6 hours vs 48 hours for urine culture) (Wojno et al., 2020).

Clinical Utility and Validity

A study in 2010 by Bruyere et al. (2010) using 353 patients undergoing prostate biopsy show that the routine use of obtaining a pre-operative urine culture is not clinically relevant to positive outcomes. "Of the 353 men, 12 had a pre-biopsy-positive bacterial culture and underwent prostate biopsy without any infectious complication. Fifteen patients with a negative pre-biopsy culture developed a post-biopsy-positive bacterial culture, but remained asymptomatic without any treatment. Only four men from the group without pre-biopsy bacteriuria developed an infectious complication, requiring 3 weeks of antibiotic therapy." Both experimental and control groups had similar rates of complication, suggesting "that routine urine bacterial culture before prostate biopsy is not useful when antibiotic prophylaxis and enema are performed" (Bruyere et al., 2010).

The method of obtaining the urine sample for culture testing is important. This is especially true for children. A 2017 study of 4808 acutely ill children demonstrated that there was modest agreement between the results obtained if the test was conducted by a research laboratory versus a health service laboratory; however, the method of obtaining the urine sample did have significance. The calculated areas under the receiver-operator curve (AUC) for UTI ranged from 0.75-0.86 if the sample was obtained using a clean-catch method versus AUC values of 0.65-0.79 if the sample was obtained using "nappy pad samples". The authors conclusions were that urine cultures did not necessarily have to be sent to a research lab for testing, but that "primary care clinicians should try to obtain clean catch samples, even in very young children" (Birnie et al., 2017). A smaller study of 83 infants compared the use of urine obtained either via bladder catheterization or suprapubic aspiration (SPA) (Eliacik et al., 2016). All 83 infants had previously tested positive using urine culture samples obtained via bladder catheterization. Then, they had samples removed by SPA. The SPA samples were used in both urinalysis and urine culture testing, and "only 24 (28.9%) and 20 (24%) yielded positive urine culture and abnormal urinalysis data, respectively." This indicates a 71.1% false positive result rate if the urine sample is obtained using bladder catheterization. "In infants younger than 12 months, SPA is the best method to avoid bacterial contamination, showing better results than transurethral catheterization" (Eliacik et al., 2016).

Another study by Ducharme et al. (2007) researched the use of either urine cultures and/or reagent test strips for use in diagnosing UTIs in elderly patients. The study consisted of 100 elderly patients with one group having no symptoms and non-infectious complaints and a second group "presenting with acute confusion, weakness or fever but no apparent urinary symptoms". Their results show that "of the 33 positive cultures, 10 had negative reagent strips. Thirteen of the 14 positive nitrite tests were culture positive for a specificity of 92.8% and a sensitivity of 36.1%. Positive cultures did not infer a diagnosis of UTI. Of the 67 positive reagent strips, 41 (61.2%) were associated with negative cultures." They conclude that, "in the elderly, reagent testing is an unreliable method of identifying patients with positive blood cultures. Moreover, positive urine culture rates are only slightly higher in patients with vague symptoms attributable to UTI than they are in (asymptomatic) patients treated for non-urologic problems, which suggests that many positive cultures in elderly patients with non-focal systemic symptoms are false-positive tests reflecting asymptomatic bacteriuria and not UTIs" (Ducharme et al., 2007).

A study by Price et al. (2016) show that using an enhanced quantitative urine culture (EQUC) increased the detection of microorganisms in UTIs. This study consisted of 150 female patients using an initial UTI symptom assessment questionnaire to divide them into symptomatic and asymptomatic groups. Both sets underwent culture testing using both conventional urine culture testing and an EQUC method. "Compared to expanded-spectrum EQUC, standard urine culture missed 67% of uropathogens overall and 50% in participants with severe urinary symptoms. Thirty-six percent of participants with missed uropathogens reported no symptom resolution after treatment by standard urine culture results." Their protocol resulted in an "84% uropathogen detection relative to 33% detection by standard urine culture" (Price et al., 2016).

Cantey et al. (2015) evaluated the utility of a Gram stain relative to UA. In reviewing 312 pediatric patients with suspected UTIs who had urine cultures, UA, and Gram stain performed, the researchers concluded that the UA "has excellent negative predictive value that is not enhanced by urine Gram stain and that antibiotic selection did not vary based on the urine Gram stain result." When compared to the urine Gram stain, the UA had equal sensitivity (97.3% vs 97.5%) and a higher specificity (85% vs 74%). This could allow the UA to take precedent as a test performed over the Gram stain due to its increased efficiency and lower cost (Cantey et al., 2015).

Petty et al. (2019) evaluated the risk factors and clinical outcomes of treating asymptomatic bacteriuria (ASB) in hospitalized patients. There were 2733 patients with ASB (defined as "positive urine culture without any documented signs or symptoms attributable to urinary tract infection") included in the study. A total of 2259 patients were treated with antibiotics for an average of seven days. Certain characteristics tended to correlate with ASB treatment, such as positive urinalysis (odds ratio [OR] = 2.83), leukocytosis (OR = 1.55), and dementia (OR = 1.57). However, treatment of ASB was found to be associated with longer duration of hospitalization after urine testing (four vs three days; relative risk, 1.37), although no other differences in secondary outcomes were identified. The authors concluded that "hospitalized patients with ASB commonly receive inappropriate antibiotic therapy. Antibiotic treatment did not appear to be associated with improved outcomes; rather, treatment may be associated with longer duration of hospitalization after urine testing." The authors also recommended stewardship efforts to reduce inappropriate treatment (Petty et al., 2019).

Coussement et al. (2019) investigated the prevalence of ASB among kidney transplant patients beyond two months post-transplant. The authors identified 500 post-transplant patients, of which 17 had ASB (3.4%). Further, of the 76 patients that were 2-12 months post-transplant, only one had ASB, and of the other 424 patients, 16 patients had ASB. The authors concluded that the prevalence of ASB past the second month of kidney transplant was low and that further studies were needed to ascertain the cost-effectiveness of the screen-and-treat strategy in this population (Coussement et al., 2019). This finding regarding screening and treating ASB was confirmed by Fontserè et al. (2021), who found that the "treatment of A[S]B diminished the microbiological cure and increased the rates of microbiologic relapses and reinfections… treated A[S]B patients showed a trend of developing symptomatic urinary tract infection in the following six months."

Guidelines and Recommendations

Choosing Wisely

Choosing Wisely, an initiative by the American Board of Internal Medicine (ABIM) Foundation, consists of several national organizations representing medical specialists that write recommendations within their respective field to help choose care based on scientific evidence and to help reduce testing redundancy.

2019 AMDA-The Society for Post-Acute and Long-Term Care Medicine (AMDA)

In 2019 and 2022, the AMDA updated their earlier 2017 Choosing Wisely guideline concerning the use of urine cultures. Due to over-use of antibiotics and overtreatment of UTIs, they state "Don't obtain urine tests until clinical criteria are met." Since the urine culture would have a high likelihood of yielding a positive result in an otherwise asymptomatic case, this "contributes to the over-use of antibiotic therapy in this setting, leading to an increased risk of diarrhea or other adverse drug events, resistant organisms and infection due to *Clostridioides difficile*." They also note that "the finding of asymptomatic bacteriuria may lead to an erroneous assumption that a UTI is the cause of an acute change of status, hence failing to detect or delaying the timelier detection of 5 signs and symptoms likely indicative of uncomplicated cystitis. These include dysuria, and one or more of the following: frequency, urgency, supra-pubic pain or gross hematuria" (AMDA, 2022).

2018 American Academy of Pediatrics-Section on Nephrology (ASPN) and the American Society of Pediatric Nephrology (AAP)

The AAP Section on Nephrology and the ASPN issued a joint Choosing Wisely recommendation stating, "Avoid ordering follow-up urine cultures after treatment for an uncomplicated urinary tract infection (UTI) in patients

that show evidence of clinical resolution of infection. Studies have shown that clinical resolution of infection is adequate for determining effectiveness of antibiotic therapy after treatment for a UTI" (AAP & ASPN, 2018).

2016 American Academy of Pediatrics (AAP)

The AAP updated their Choosing Wisely recommendation in 2022: "Avoid the use of surveillance cultures for the screening and treatment of asymptomatic bacteriuria. There is no evidence that surveillance urine cultures or treatment of asymptomatic bacteriuria is beneficial. Surveillance cultures are costly and produce both false positive and false negative results. Treatment of asymptomatic bacteriuria is harmful and increases exposure to antibiotics, which is a risk factor for subsequent infections with a resistant organism. This also results in the overall use of antibiotics in the community and may lead to unnecessary imaging" (AAP, 2016).

2019 Society for Healthcare Epidemiology of America (SHEA)

The SHEA recommendation in Choosing Wisely is more encompassing: "Don't perform cultures (e.g. urine, blood, sputum cultures) or test for *C. difficile* unless patients have signs or symptoms of infection. Tests can be falsely positive leading to over diagnosis and overtreatment. Although important for diagnosing disease when used in patients with appropriate signs or symptoms, these tests often are positive when an infection is not present. For example, in the absence of signs or symptoms, a positive blood culture may represent contamination, a positive urine culture could represent asymptomatic bacteriuria, and a positive test for *C. difficile* could reflect colonization. There are no perfect tests for these or most infections. If these tests are used in patients with low likelihood of infection, they will result in more false positive tests than true positive results, which will lead to treating patients without infection and exposing them to risks of antibiotics without benefits of treating an infection" (SHEA, 2019).

European Association of Urology (EAU)

The EAU has guidelines for urological infections that are updated annually. With respect to **ASB**, they state (all with a 'Strong' strength of rating), "Do not screen or treat asymptomatic bacteriuria in the following conditions:

- Individuals without risk factors;
- Patients with well-regulated diabetes mellitus;
- Post-menopausal [individuals];
- Elderly institutionalised patients;
- Patients with dysfunctional and/or reconstructed lower urinary tracts;
- Patients with renal transplants;
- Patients prior to arthroplasty surgeries;
- Patients with recurrent urinary tract infections."

They do recommend with a 'Strong' rating to "screen for and treat asymptomatic bacteriuria prior to urological procedures breaching the mucosa" and a 'Weak' rating to "screen for and treat asymptomatic bacteriuria in pregnant [individuals] with standard short course treatment or single dose fosfomycin trometamol." They do recommend to "diagnose **recurrent UTI** by urine culture" with a 'Strong' rating. Please note that recurrent UTI indicates that the occurrences are symptomatic. It is further specified that "A urine culture must therefore be taken prior to such interventions".

With respect to **uncomplicated cystitis**, they give a 'Strong' rating to only perform urine culture analysis "in the following situations:

- Suspected acute pyelonephritis;
- Symptoms that do not resolve or recur within four weeks after the completion of treatment;
- Individuals who present with atypical symptoms;
- Pregnant [individuals]."

The EAU gives a 'Weak' recommendation to "use urine dipstick testing for diagnosis of acute uncomplicated cystitis."

In cases of uncomplicated **pyelonephritis**, the EAU recommends with a 'Strong' rating to "perform urinalysis (e.g. using the dipstick method), including the assessment of white and red blood cells and nitrite, for routine diagnosis" and to "perform urine culture and antimicrobial susceptibility testing in patients with pyelonephritis."

The EAU defines **complicated UTI** (cUTI) as occurring "in an individual in whom factors related to the host (e.g. underlying diabetes or immunosuppression) or specific anatomical or functional abnormalities related to the urinary tract (e.g. obstruction, incomplete voiding due to detrusor muscle dysfunction) are believed to result in an infection that will be more difficult to eradicate than an uncomplicated infection." Other factors associated with cUTIs include vesicoureteral reflux, recent history of instrumentation, UTI in males, pregnancy, and healthcare-associated infections. "Laboratory urine culture is the recommended method to determine the presence or absence of clinically significant bacteriuria in patients suspected of having a cUTI".

For **catheter-associated UTIs** (CAUTI), the EAU recommends with 'Strong' ratings to "not carry out routine urine culture in asymptomatic catheterised patients", to "not use pyuria as sole indicator for catheter-associated UTI", and to "not use the presence or absence of odorous or cloudy urine alone to differentiate catheter-associated asymptomatic bacteriuria from catheter-associated UTI."

In cases of **urethritis,** the EAU states that "Clinicians should always perform point-of-care diagnostics (e.g. Gram staining, first-void urine with microscopy, leukocyte esterase testing) if available to obtain objective evidence of urethral inflammation and to guide treatment…men who meet the criteria for urethritis should be tested for *C. trachomatis, M. genitalium* and *N. gonorrhoeae* with nucleic acid amplification tests (NAAT), even if point-of-care tests are negative for gonorrhoeae…*N. gonorrhoeae* and chlamydia cultures are mainly to evaluate treatment failures and monitor developing resistance to current treatment." With a 'Strong' rating, they recommend:

- "Perform a Gram stain of urethral discharge or a urethral smear to preliminarily diagnose gonococcal urethritis."
- "Perform a validated nucleic acid amplification tests on a first-void urine sample or urethral smear to prior to empirical treatment to diagnose chlamydial and gonococcal infections."
- "Perform a urethral swab culture, prior to initiation of treatment, in patients with a positive NAAT for gonorrhoea to assess the antimicrobial resistance profile of the infective strain."
- "Use a pathogen directed treatment based on local resistance data."

For **urosepsis,** the EAU strongly recommends to "Take a urine culture and two sets of blood cultures before starting antimicrobial treatment."

For the diagnosis and disease management of **bacterial prostatitis** (BP), the EAU recommends with a 'Strong' rating to "perform the Meares and Stamey 2- or 4-glass test in patients with [chronic bacterial prostatitis (CBP)]". They only give a 'Weak' rating in the use of the urine dipstick test and blood culture with a total blood count for acute bacterial prostatitis (ABP). They also give a 'Weak' rating to their recommendation to "not routinely perform microbiological analysis of the ejaculate alone to diagnose CBP"; however, they give a 'Strong' recommendation to "treat acute bacterial prostatitis according to the recommendations for complicated UTIs" where they recommend a laboratory urine culture.

The EAU's recommendation in cases of suspected **acute infective epididymitis** (with a 'Strong' rating) is "to obtain a mid-stream urine and a first-voided urine for pathogen identification by culture and nucleic acid amplification test." It should be noted that, if the acute scrotal pain and/or swelling is due to suspected torsion, then a urine culture is not necessary. In that case, "urgent surgical exploration" is recommended instead (Bonkat et al., 2024).

World Health Organization (WHO)

The *WHO recommendations on antenatal care for a positive pregnancy experience* in 2016 does include a recommendation to test for ASB in pregnant individuals. "Midstream urine culture is the recommended method for diagnosing asymptomatic bacteriuria (ASB) in pregnancy. In settings where urine culture is not available, the onsite midstream urine Gram-staining is recommended over the use of dipstick tests as the method for diagnosing ASB in pregnancy." They do make note of the amount of time a urine culture takes (up to 7 days) but state that it is "the gold standard". The concern of ASB in pregnancy is because "ASB is associated with an increased risk of preterm birth" (WHO, 2016).

Canadian Paediatric Society (CPS)

In 2014, the CPS issued their position statement titled *Urinary tract infection in infants and children: Diagnosis and management* and reaffirmed their statement in 2020. Their recommendations are for children >2 months old. They recommend that "infants from two to 36 months of age with a fever of >39°C and no other source for fever on history or physical examination…should have urine collected for urinalysis. Unless this test is completely normal, they should then have urine collected by catheter or suprapubic aspirate [SPA] sent for culture." Currently, CPS notes this statement as inapplicable for infants under 2 months of age (Robinson et al., 2020).

If the child has been toilet-trained, then the urine sample can be collected midstream in lieu of the catheter. "Children with possible UTI who require antibiotic treatment immediately for other indications, such as suspected bacteremia, should have urine collected for urinalysis, microscopy, and culture." Again, this sample should be obtained via either catheterization or SPA unless the child has been toilet-trained. They also state that "urine collection must occur before starting antibiotics because a single dose of an effective antibiotic rapidly sterilizes the urine" (Robinson et al., 2020).

American Academy of Pediatrics (AAP)

The AAP issued guidelines for UTIs in children 2 to 24 months of age in 2011, which were reaffirmed in 2016. With an "A" grade for evidence quality and a strong recommendation, they issued their Action Statement 1: "If a clinician decides that a febrile infant with no apparent source for the fever requires antimicrobial therapy to be administered because of ill appearance or another pressing reason, the clinician should ensure that a urine specimen is obtained for both culture and urinalysis before an antimicrobial agent is administered; the specimen needs to be obtained through catheterization or SPA, because the diagnosis of UTI cannot be established reliably through culture of urine collected in a bag." For instances where the clinician believes that the febrile child does not warrant immediate antimicrobial therapy, the AAP in Action Statement 2 (strong recommendation; "A" grade of evidence) the following: (Action Statement 2a) "If the clinician determines the febrile infant to have a low likelihood of UTI [in Table below] then the clinical follow-up monitoring without testing is sufficient." In Action Statement 2b, the AAP states: "If the clinician determines that the febrile infant is not in a low-risk group [in Table below], then there are 2 choices. Option 1 is to obtain a urine specimen through catheterization or SPA for culture and urinalysis. Option 2 is to obtain a urine specimen through the most convenient means and to perform a urinalysis. If the urinalysis results suggest a UTI (positive leukocyte esterase test results or nitrite test or microscopic analysis results positive for leukocytes or bacteria), then a urine specimen should be obtained through catheterization or SPA and cultures; if urinalysis of fresh (<1 hour since void) urine yields negative leukocyte esterase and nitrite test results, then it is reasonable to monitor the clinical course without initiating anti-microbial therapy, recognizing that negative urinalysis results do not rule out a UTI with certainty." The table below from (Roberts, 2011) depicts the level of risk factors separated by gender.

Individual Risk Factors: Girls
White race Age < 12 mo Temperature ≥ 39°C Fever ≥ 2 d Absence of another source of infection

Probability of UTI	No. of Factors Present
≤1%	No more than 1
≤2%	No more than 2

Individual Risk Factors: Boys
Nonblack race Temperature ≥ 39°C Fever > 24 h Absence of another source of infection

Probability of UTI	No. of Factors Present	
	Uncircumcised	Circumcised
≤1%	[a]	No more than 2
≤2%	None	No more than 3

FIGURE 2
Probability of UTI Among Febrile Infant Girls[28] and Infant Boys[30] According to Number of Findings Present. [a]Probability of UTI exceeds 1% even with no risk factors other than being uncircumcised.

Canadian Urological Association (CUA)

The CUA *Guidelines for the diagnosis and management of recurrent urinary tract infection* contains an algorithm for an individual "without a prior history of structural or functional abnormalities of the urinary tract presenting with 3 or more UTIs in 12 months" that requires a urine culture during a time when the patient is symptomatic followed by a urine culture two weeks after initiating treatment with sensitivity-adjusted antibiotics (Level 4 evidence, Grade C recommendation [Recommendation 2c]). In doing so, this "may aid in confirming the diagnosis of UTI, as well as guiding further specialist evaluation and management." For recurrent uncomplicated UTI, "culture and sensitivity analysis should be performed at least once while the patient is symptomatic…. A midstream urine bacterial count of 1 X 10^5 CFU/L should be considered a positive culture while the patient is symptomatic." For patients that choose an option of 'self-start antibiotic' therapy, "it is not necessary to culture the urine after UTI self-diagnosis since there is a 86% to 92% concordance between self-diagnosis and urine culture in an appropriately selected patient population. Patients are advised to contact a health care provider if symptoms do not resolve within 48 hours for treatment based on culture and sensitivity" (Dason et al., 2011).

American Urological Association (AUA)

The AUA issued a white paper in 2014 concerning CAUTIs. In the white paper, they refer to the use of the National Surgical Quality Improvement Program (NSQIP) definition of UTIs, which does reference the use of urine culture. It should be noted, however, that this definition requires at least a minimum of one of the following symptoms: fever (>38˚C), urgency, frequency, dysuria, or suprapubic tenderness. They too refer to the 2009 IDSA guidelines concerning CAUTIs as well as those of the EAU. They state that there are "no consistent guidelines are available on how to obtain urine for culture from chronically catheterized patients, or what constitutes true urinary tract infection versus asymptomatic bacteriuria." They make note of a study concerning the possible cost-effectiveness of the use of dipsticks to screen asymptomatic ICU patients for CAUTIs. They conclude, "however, as previously discussed, screening of asymptomatic patients may not be warranted, and treatment is usually not recommended in these cases" (Averch et al., 2014).

The AUA released guidelines for primary vesicoureteral reflux in children and recommend "Urinalysis for proteinuria and bacteriuria is recommended. If the urinalysis indicates infection, a urine culture and sensitivity is recommended". The AUA also recommends urinalysis annually as part of the follow-up procedure (AUA, 2017).

The AUA published a 2020 update to their 2012 guideline on Urologic Procedures and Antimicrobial Prophylaxis, termed a "Best Practice Statement". The AUA recommends that "Prior to any urologic procedure, evaluation of a patient's urinary tract symptoms suggestive of a UTI should include a simple dipstick, laboratory performed microscopy, and/or formal culture." The AUA also states that "Positive microscopy findings should be confirmed with a culture for antimicrobial sensitivities in the perioperative setting where the risk of an SSI is high and targeted antimicrobial treatment may be required. Urine culture should not be performed without an

accompanying urine microscopy due to common sample contamination as well as bacterial colonization" (Lightner et al., 2020).

National Institute for Health and Care Excellence (NICE)

In 2023, the NICE updated their quality standards for UTIs in adults. They released five quality statements:

- "Statement 1: [Individuals] aged under 65 years are diagnosed with a urinary tract infection (UTI) if they have 2 or more key urinary symptoms and no other excluding causes or warning signs.
- Statement 2: Adults with indwelling urinary catheters do not have dipstick testing to diagnose UTIs.
- Statement 3: Men and non-pregnant [individuals] are not prescribed antibiotics to treat asymptomatic bacteriuria.
- Statement 4: Non-pregnant [individuals] with an uncomplicated lower UTI are prescribed a 3-day course of antibiotics, and men and pregnant women with an uncomplicated lower UTI are prescribed a 7-day course of antibiotics.
- Statement 5: Men with a recurrent UTI, and women with a recurrent lower UTI where the cause is unknown or a recurrent upper UTI are referred for specialist advice" (NICE, 2023).

NICE also recommended to send urine samples for culture if a baby or child:

- "is thought to have acute upper UTI (pyelonephritis)
- has a high to intermediate risk of serious illness
- is under 3 months
- has a positive result for leukocyte esterase or nitrite
- has recurrent UTI
- has an infection that does not respond to treatment within 24 to 48 hours, if no sample has already been sent
- has clinical symptoms and signs but dipstick tests do not correlate" (NICE, 2022).

American Urological Association (AUA)/Canadian Urological Association (CUA)/Society of Urodynamics, Female Pelvic Medicine & Urogenital Reconstruction (SUFU)

The AUA, CUA, and SUFU released joint guidelines in 2019. The guidelines were reviewed, and validity confirmed in 2022. These joint guidelines focus on "recurrent episodes of uncomplicated cystitis" in individuals and are not intended for "pregnant [individuals], patients who are immunocompromised, those with anatomic or functional abnormalities of the urinary tract, women with rUTIs due to self-catheterization or indwelling catheters, or those exhibiting signs or symptoms of systemic bacteremia, such as fever and flank pain." Their recommendations are listed below:

- "Clinicians should obtain urinalysis, urine culture and sensitivity with each symptomatic acute cystitis episode prior to initiating treatment in patients with rUTIs (Moderate Recommendation; Evidence Level: Grade C)"
- "Clinicians should omit surveillance urine testing, including urine culture, in asymptomatic patients with rUTIs (Moderate Recommendation; Evidence Level: Grade C)" (Anger et al., 2019).

Infectious Diseases Society of America (IDSA)

These 2019 guidelines were intended to update the 2005 IDSA guidelines. Their recommendations for ASB are as follows:

- "In infants and children, we recommend against screening for or treating asymptomatic bacteriuria".
- "In healthy premenopausal, nonpregnant [individuals] or healthy postmenopausal [individuals], we recommend against screening for or treating ASB".

- "In pregnant [individuals], we recommend screening for and treating ASB".
- "In older, community-dwelling persons who are functionally impaired, we recommend against screening for or treating ASB".
- "In older persons resident in long-term care facilities, we recommend against screening for or treating ASB".
- "In patients with diabetes, we recommend against screening for or treating ASB".
- "In renal transplant recipients who have had renal transplant surgery >1 month prior, we recommend against screening for or treating ASB".
- "In patients with nonrenal solid organ transplant (SOT), we recommend against screening for or treating ASB".
- "In patients with high-risk neutropenia (absolute neutrophil count <100 cells/mm3, ≥7 days' duration following chemotherapy), we make no recommendation for or against screening for or treatment of ASB".
- "In patients with spinal cord injury (SCI), we recommend against screening for or treating ASB".
- "In patients with a short-term indwelling urethral catheter (<30 days), we recommend against screening for or treating ASB".
- "In patients undergoing elective nonurologic surgery, we recommend against screening for or treating ASB".
- "In patients who will undergo endoscopic urologic procedures associated with mucosal trauma, we recommend screening for and treating ASB prior to surgery".

The guideline also states that it has been reviewed and endorsed by the following societies: "the Society of Healthcare Epidemiology of America, Pediatric Infectious Diseases Society, American College of Obstetrics and Gynecology, Association of Medical Microbiology and Infectious Diseases Canada, European Society of Clinical Microbiology and Infectious Diseases, European Association of Urology, and the American Urological Association" (Nicolle et al., 2019).

US Preventive Services Task Force (USPSTF)

The USPSTF recommends screening for "asymptomatic bacteriuria using urine culture in pregnant persons", but recommends against "screening for asymptomatic bacteriuria in nonpregnant adults" (USPSTF, 2019).

American Society of Transplantation Infectious Diseases

These guidelines focus on UTIs within the kidney transplant (KT) population. The recommendations are listed below:

"We recommend against routinely collecting urine culture or treating bacteriuria in asymptomatic KT patients more than two months after KT".

"If screening asymptomatic KT recipients any time in the post-transplant period and A[S]B [asymptomatic bacteriuria] is found, a second urine culture (minimizing risk of contamination) should be collected and reviewed prior to decision about whether or not to treat AB. We strongly recommend observation without treatment of asymptomatic KT patients recipients who show clearance of the initial bacteriuria or development of different organism in the urine" (Goldman & Julian, 2019).

Choosing Wisely Canada

The Association of Medical Microbiology and Infectious Diseases Canada recommends against collecting "urine specimens for culture from adults who lack symptoms localizing to the urinary tract or fever unless they are pregnant or undergoing genitourinary instrumentation where mucosal bleeding is expected." The guideline further recommends that laboratories "consider supplementing educational efforts to reduce collection of urine cultures from asymptomatic patients with analytical interventions that reduce processing of low-value specimens" (Association of Medical Microbiology and Infectious Diseases Canada, 2022).

Applicable State and Federal Regulations

DISCLAIMER: If there is a conflict between this Policy and any relevant, applicable government policy for a particular member [e.g., Local Coverage Determinations (LCDs) or National Coverage Determinations (NCDs) for Medicare and/or state coverage for Medicaid], then the government policy will be used to make the determination. For the most up-to-date Medicare policies and coverage, please visit the Medicare search website: https://www.cms.gov/medicare-coverage-database/search.aspx. For the most up-to-date Medicaid policies and coverage, visit the applicable state Medicaid website.

Food and Drug Administration (FDA)

Many labs have developed specific tests that they must validate and perform in house. These laboratory-developed tests (LDTs) are regulated by the Centers for Medicare and Medicaid (CMS) as high-complexity tests under the Clinical Laboratory Improvement Amendments of 1988 (CLIA '88). LDTs are not approved or cleared by the U. S. Food and Drug Administration; however, FDA clearance or approval is not currently required for clinical use.

Applicable CPT/HCPCS Procedure Codes

CPT	Code Description
87077	Culture, bacterial; aerobic isolate, additional methods required for definitive identification, each isolate
87086	Culture, bacterial; quantitative colony count, urine
87088	Culture, bacterial; with isolation and presumptive identification of each isolate, urine
87140	Culture, typing; immunofluorescent method, each antiserum
87147	Culture, typing; immunologic method, other than immunofluorescence (eg, agglutination grouping), per antiserum
87149	Culture, typing; identification by nucleic acid (DNA or RNA) probe, direct probe technique, per culture or isolate, each organism probed
87181	Susceptibility studies, antimicrobial agent; agar dilution method, per agent (eg, antibiotic gradient strip)
87186	Susceptibility studies, antimicrobial agent; microdilution or agar dilution (minimum inhibitory concentration [MIC] or breakpoint), each multi-antimicrobial, per plate

Procedure codes appearing in Medical Policy documents are included only as a general reference tool for each policy. They may not be all-inclusive.

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Revision History

Effective Date	Summary
01/01/2025	Reviewed and Updated: Updated the background, guidelines and recommendations, and evidence-based scientific references. Literature review did not necessitate any modifications to coverage criteria.
11/03/2023	Reviewed and Updated: Updated the background, guidelines and recommendations, and evidence-based scientific references. Literature review did not necessitate any modifications to coverage criteria. The following edits were made for clarity: All CCs edited for clarity and consistency. Added CPT code 87186.
12/01/2022	Reviewed and Updated: Updated background, guidelines, and evidence-based scientific references. Literature review did not necessitate any modification to the coverage criteria. Coverage criteria edited for clarity: "Women" replaced with "individuals" and "," added after bacteriuria in CC1. Now reads: "In pregnant individuals, urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) for any urinary tract infection, asymptomatic or symptomatic, including suspected cystitis, pyelonephritis, and asymptomatic bacteriuria, MEETS COVERAGE CRITERIA." CC2 edited for clarity: "Prior to undergoing urological interventions which breach the mucosa, urine culture testing (with isolate identification and antibiotic susceptibilities if applicable) in asymptomatic patients MEETS COVERAGE CRITERIA." C3, addition of "a" before "possible UTI"
06/01/2022	Initial Policy Implementation

EXCLUSIONS:
Note: A complete description of the process by which a given technology or service is evaluated and determined to be experimental, investigational or unproven is outlined in MP 15 - Experimental Investigational or Unproven Services or Treatment.

Medicaid Business Segment:

Any requests for services, that do not meet criteria set in the PARP, may be evaluated on a case by case basis.

LINE OF BUSINESS:
Eligibility and contract specific benefits, limitations and/or exclusions will apply. Coverage statements found in the line of business specific benefit document will supersede this policy. For Medicare, applicable LCD's and NCD's will supercede this policy. For PA Medicaid Business segment, this policy applies as written.

Geisinger Health Plan may refer collectively to health care coverage sponsors Geisinger Health Plan, Geisinger Quality Options, Inc., and Geisinger Indemnity Insurance Company, unless otherwise noted. Geisinger Health Plan is part of Geisinger, an integrated health care delivery and coverage organization.

Coverage for experimental or investigational treatments, services and procedures is specifically excluded under the member's certificate with Geisinger Health Plan. Unproven services outside of an approved clinical trial are also specifically excluded under the member's certificate with Geisinger Health Plan. This policy does not expand coverage to services or items specifically excluded from coverage in the member's certificate with Geisinger Health Plan. Additional information can be found in MP015 Experimental, Investigational or Unproven Services.

Prior authorization and/or pre-certification requirements for services or items may apply. Pre-certification lists may be found in the member's contract specific benefit document. Prior authorization requirements can be found at https://www.geisinger.org/health-plan/providers/ghp-clinical-policies