

Care and Treatment Plan: Lower Urinary Tract Infection – Adult and Pediatric

Definition¹⁻³

An **uncomplicated** lower urinary tract infection (UTI, also known as cystitis) is an infection of the lower sections of the urinary tract and/or bladder and is associated with consistently positive treatment outcomes. UTIs are more common in clients with vaginas due to shorter urethral length and other anatomical and physiological differences, including normal vaginal flora, pH and environmental conditions.

Infection of (or progression to) the upper urinary tracts or kidney(s) is indicative of pyelonephritis and considered **complicated**, with a higher risk of treatment failure or escalation of illness. Pyelonephritis presents as a more severe infection, potentially including fever or other systemic symptoms, flank pain or CVA tenderness, documented pyelonephritis or bacteremia, and sepsis; these cases do not fall within the definition of lower UTI and may not be managed by RN(C)s.

While UTIs are much less common in clients with penises, sex assigned at birth and gender are no longer considered categorical indicators of complexity. Careful review of each client presentation is required to assess for the complexity of illness and risk factors.

Registered Nurses with **RN First Call** Certified Practice (RN(C)) designation are authorized to manage, diagnose, and treat uncomplicated lower UTIs in **adults only**.

Registered Nurses with **Remote Nursing** Certified Practice (RN(C)) designation are authorized to manage, diagnose and treat lower UTIs **in adults**, and in children who are **2 years of age and older**.

Management and Intervention

Goals of Treatment

- Eradicate infection
- Relieve symptoms
- Prevent complications (including ascending infection)

Non-pharmacologic Interventions

- Rest
- Maintain hydration

Note: Clients may inquire about complementary and alternative medical (CAM) treatments. However, CAM treatments may not be supported by empirical evidence and may cause harm. Client education regarding recommended treatment options is important.

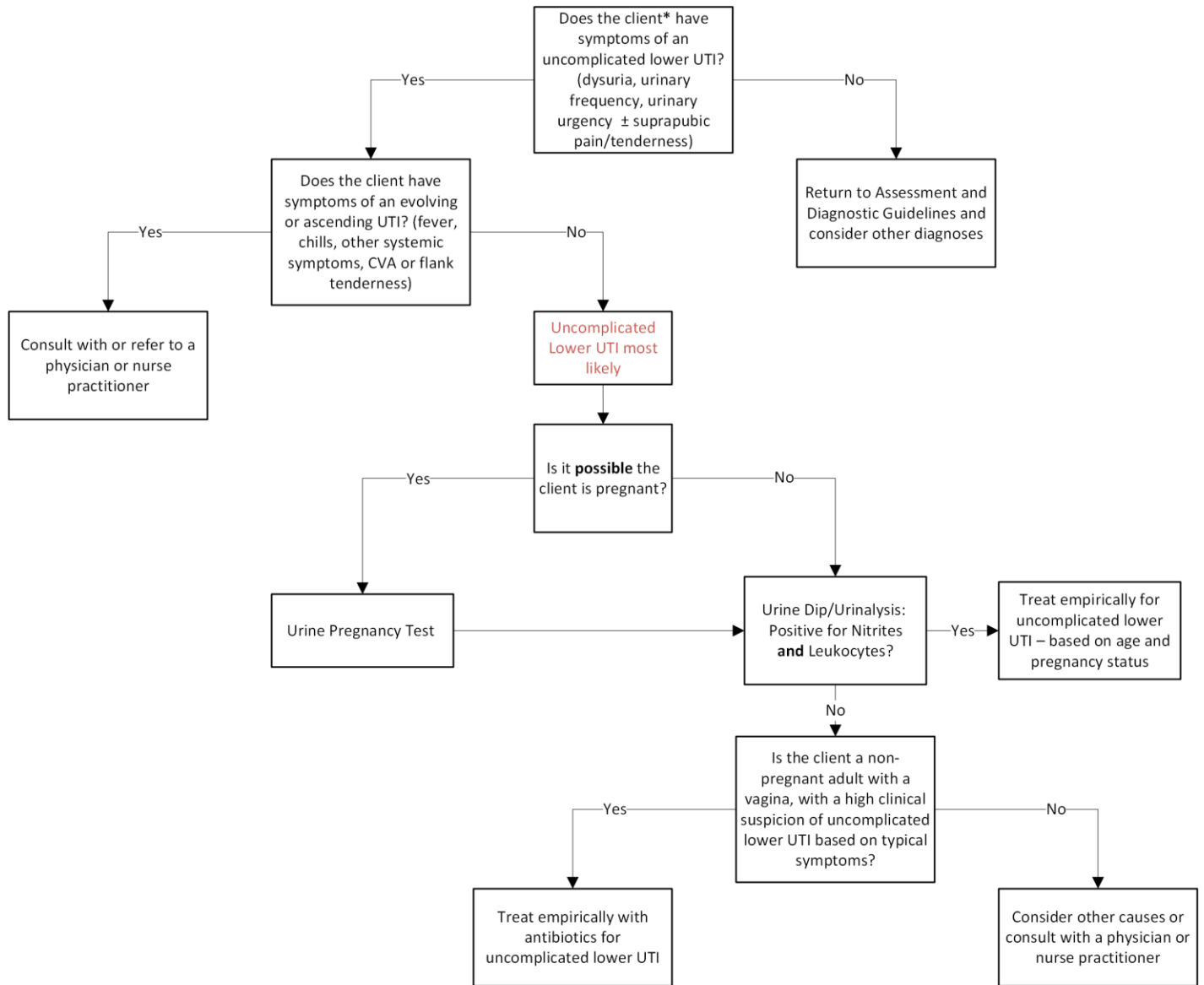
Decision To Treat¹⁻⁷

The decision to treat clients for suspected or confirmed uncomplicated lower UTI depends on a combination of findings from patient interview (symptoms), history, physical assessment (signs), and diagnostic testing.

An RN(C) may choose to initiate treatment for a UTI in individuals with vaginal anatomy who are not pregnant, based on client presentation and reported symptoms alone. For all other populations, diagnostic evidence through a urinary analysis or culture and sensitivity is required before initiating treatment with antibiotics.



Decision Making Algorithm for Suspected Lower UTI



* Registered Nurses with **RN First Call** Certified Practice (RN(C)) designation are authorized to manage, diagnose, and treat uncomplicated lower UTIs in **adults only**. Registered Nurses with **Remote Nursing** Certified Practice (RN(C)) designation are authorized to manage, diagnose and treat lower UTIs in **adults**, and in **children who are 2 years of age and older**.

Urine dip/urinalysis diagnostic considerations for suspected lower UTI:

The most accurate diagnostic findings for cystitis are a combination of leukocytes (pyuria) and nitrites on urine dipstick or urinalysis (sensitivity 75-90%, specificity 92-100%), or positive urine culture.

- **Pyuria:** the presence of leukocytes in a dipstick sample or urinalysis is indicative of the presence of bacteria
 - Presence of pyuria is a positive indicator for UTI. Absence is a potential indication of an alternative diagnosis
- **Nitrites:** the presence of nitrites in a dipstick sample or urinalysis is indicative of the presence of *enterobacterales* species that convert nitrates to nitrites
 - Potential for false negatives with non-nitrate-reducing bacteria, such as *Staphylococcus saprophyticus*, *Pseudomonas* species, or *enterococci* species⁷



Note: Urinalysis results that are positive for leukocytes and nitrites in the absence of typical lower UTI symptoms are indicative of asymptomatic bacteriuria. Clients presenting with asymptomatic bacteriuria require a consult or referral to a physician or nurse practitioner.

In any cases where diagnosis is unclear, upper urinary tract infection is suspected, or other complications, a consultation or referral to a physician or nurse practitioner is required.

Pharmacologic Interventions: Non-Pregnant Adult^{1-3,8}

To relieve pain and tenderness:

- Acetaminophen 325mg, 1-2 tabs orally q4-6h PRN
- Ibuprofen 200mg, 1-2 tabs orally q4-6h PRN

Preferred oral antibiotic selections:

- Nitrofurantoin (Macrobid) 100mg tablet orally twice daily
 - Duration: clients with a vagina: **5 days**; clients with a penis: **7 days, OR**

Note: Nitrofurantoin renal and geriatric precautions: contraindicated if GFR is known to be < 45ml/min or creatinine clearance <30ml/min.³

Alternative regimen:

Use if preferred options are unavailable or inappropriate for your client:

- Cefixime 400mg orally daily
 - Duration: clients with a vagina: **5-7 days**; clients with a penis: **7 days**
- Sulfamethoxazole-Trimethoprim double strength (Septra DS) 800/160mg tablet orally twice daily
 - Duration: clients with a vagina: **3 days**; clients with a penis: **7 days, OR**
- Fosfomycin 3g orally for one dose

Note: Fosfomycin should only be selected for clients where adherence with preferred or alternative treatment is a barrier, as digestive disruption can be increased by single-dose ingestion.

Last choice regimen – fluoroquinolone antibiotics:

Only use if **all other** options are unavailable or inappropriate for your client.

- Ciprofloxacin 250mg orally twice daily
 - Duration: clients with a vagina: **3 days**; clients with a penis: **5 days**

Note: Fluoroquinolones are associated with acute and potentially irreversible side effects such as tendinopathy, tendon rupture, peripheral neuropathy, and central nervous system effects. Their use should be limited only to those with no alternative treatment options. If concerned about the appropriateness of treatment or potential side effects, consult with a pharmacist, physician, or nurse practitioner.⁹

Pharmacologic Interventions: Pediatric^{5,6,10-12}

Note: Weight-based pediatric doses should not exceed recommended adult doses, unless otherwise specified by daily maximum dosing parameters.

To relieve pain and tenderness:

- **Acetaminophen:**¹¹
Max from all sources: Acetaminophen 75mg/kg/**day** or 4,000mg total in 24 hours - whichever is less.
 - Oral Acetaminophen: calculate 10-15mg/kg/**dose** q4-6h PRN
 - Rectal Acetaminophen: calculate 15-20mg/kg/**dose** q4-6h PRN
- **Ibuprofen:**¹²
Max from all sources: Ibuprofen 40mg/kg/**day** or 2,400mg total in 24 hours - whichever is less
 - Oral Ibuprofen: calculate 5-10 mg/kg/**dose** q6-8h PRN; max 400 mg/**dose**



Preferred oral antibiotic selections:

- Amoxicillin-clavulanate 20mg/kg/**dose** orally, three times daily, for 5-7 days (max 500mg/**dose**), **OR** (dosing based on amoxicillin component)
 - Clarification of recommendations: <25kg child is 20mg/kg/**dose**; ≥25kg child is 500mg/**dose** (max)
- Cephalexin (Keflex) 12.5mg/kg/**dose** orally, four times daily, for 5-7 days (max 4000mg/**day**)

Note: For Cephazolin, 25mg/kg/**dose** orally twice daily (BID) is an alternative to QID dosing. Although QID dosing is preferred, this alternative dosing schedule may be considered when adherence is a concern.^{5,12}

Alternative antibiotic selections:

- Cefixime 8mg/kg/**day** orally, for 5-7 days (max 400mg/**day**)
 - Dosing schedule: single dose daily or divided into 2 equal doses

Note: If a urine pregnancy test is positive regardless of age, or pregnancy is suspected in a pediatric patient of childbearing age, consider the recommendations of “pregnant and breastfeeding clients” below or consult a physician or nurse practitioner.

Pregnant and Breastfeeding Clients^{4,11,13}

Medication selection:

- Acetaminophen, Amoxicillin-Clavulanate, Cephalexin (Keflex), and Fosfomycin may be used, as above

Antibiotic alternative:

- Amoxicillin 500mg orally three times daily for 5-7 days may be given in place of other antibiotic selections (otherwise not selected due to increasing pathogen resistance rates)

Other considerations:

When administering, dispensing or prescribing a medication to an individual who is pregnant or breastfeeding, RN(C)s are encouraged to consult with interdisciplinary team members such as a pharmacist, physician or nurse practitioner, as risks and benefits of medication use may vary depending on patient-specific considerations. The considerations noted here are restricted to medications that are directly contraindicated.

- Ibuprofen is not recommended for **pregnancy**, particularly after 20 weeks gestation
- Nitrofurantoin should not be used during the third trimester of **pregnancy**, or **close to term/during delivery**
- Sulfamethoxazole-Trimethoprim (Septra DS) should not be used during **pregnancy**
- Nitrofurantoin and Trimethoprim-Sulfamethoxazole may be used during **breastfeeding**
- Fluoroquinolones should not be used during **pregnancy** or **breastfeeding**

In case of allergies to the above antibiotics, recurrent infection, culture and sensitivity swab results showing resistance to available antibiotics or unavailability of the previously listed antibiotics, consult with or refer to a physician or nurse practitioner.

Potential Complications¹⁻³

- Ascending infection (including pyelonephritis)
- Sepsis
- Recurrent cystitis

Additional pediatric considerations

- Recurrent cystitis
- Renal scarring

Note: While **uncomplicated** lower UTIs have a limited range of complications and by definition respond well to treatment, untreated or ascending infections (including those resistant to initial treatment) have the potential to cause further significant complications not entirely listed here and require immediate consultation and or referral.



Client Education/Discharge Information^{1-3,17,18}

- Advise on condition, treatment and expected course of disease process
- Counsel to return to the clinic if further symptoms develop (including fever), or symptoms do not improve in 24-48 hours after beginning treatment
- Counsel on appropriate use of medications (dose, frequency, side effects, and need to complete the entire course of medications)
- Advise regarding wiping front to back after a bowel movement, especially for clients with vaginas (e.g. shorter urethra)
- Encourage consistent and intentional perineal hygiene to reduce bacterial presence for both clients with penises and vaginas, including clean wash cloths, use of soap, and preference for showers over baths
 - Hygiene is extra significant for those with bowel or bladder incontinence and diaper use
- Advise clients that increasing oral intake can reduce the risk of UTIs, and some studies show dietary additions such as cranberry products may help clients prevent recurrent UTIs^{3,18}
- Advise to avoid spermicide use and recommend alternative contraception options

Additional pediatric considerations

- Increase fluid intake while the child is unwell
- Emphasize hygiene considerations for uncircumcised children with penises, including regular cleansing and assessment for structural abnormalities (such as phimosis) that may contribute to UTI development

Monitoring and Follow-up^{1,2,6,17-19}

- If urine culture results show resistance to the initiated anti-microbial selection, clients are to be alerted immediately and changed to a selection that demonstrates susceptibility
- If symptoms do not begin to resolve in 24-48 hours, or if symptoms continue despite treatment, the client should return to the clinic for reassessment and further investigations
- Clients with hematuria on initial presentation should follow up approximately 6 weeks after completing antimicrobial therapy to assess for persistent hematuria via urine dip/urinalysis

Additional pediatric considerations

- If symptoms progress or remain despite treatment, the client should return to the clinic for reassessment and consultation with a physician or nurse practitioner

Consultation and/or Referral^{1,2,4,20,21}

- RN(C)s should consider consultation or referral when they are unable to meet the BCCNM Registered Nurse (Certified Practice): Acting within Autonomous Scope of Practice Standard²¹
- If any diagnostic test results are returned showing evidence of an alternative diagnosis other than UTI, a consultation or referral with a physician or nurse practitioner is required
- Presence of complicating factors suggestive of upper UTI (fever [$>38^{\circ}$ C], chills, flank pain, CVA tenderness, nausea and vomiting) should immediately be referred to a physician or nurse practitioner
- Clients with vaginas who present with a second UTI within 6 months, or a third UTI within a year, should be referred to a physician or nurse practitioner for further evaluation
- Pregnant clients with recurrent or constant UTI symptoms should be referred for follow-up to a physician or nurse practitioner
- Clients with penises who present with recurrent UTIs, or suspicion of underlying anatomical causes, should be referred to a physician or nurse practitioner for further evaluation, including ruling out ongoing prostatitis
- Clients experiencing recurrent UTIs and vaginal dryness related to menopause may benefit from referral to a physician or nurse practitioner for assessment of treatment options related to vaginal estrogen



Additional pediatric considerations

- Pediatric patients with recurrent UTIs or failure to respond to treatment should be referred to a physician or nurse practitioner for further investigations

Documentation

As per agency policy and BCCNM practice standards.



References

1. Gupta K. Acute simple cystitis in male adults. UpToDate. January 23, 2025. Accessed July 27, 2025. https://www.uptodate.com/contents/acute-simple-cystitis-in-male-adults?search=urinary%20tract%20infection&topicRef=16109&source=see_link
2. Gupta K. Acute simple cystitis in female adults. UpToDate. April 8, 2025. Accessed July 13, 2025. <https://www.uptodate.com/contents/acute-simple-cystitis-in-female-adults>
3. Bono MJ, Leslie SW. Uncomplicated Urinary Tract Infections. *National Library of Medicine [StatPearls]*. Published online February 21, 2025:10-13. Accessed July 13, 2025. <https://www.ncbi.nlm.nih.gov/books/NBK470195/>
4. Gupta K. Urinary tract infections and asymptomatic bacteriuria in pregnancy - UpToDate. UpToDate. October 10, 2024. Accessed July 13, 2025. <https://www.uptodate.com/contents/urinary-tract-infections-and-asymptomatic-bacteriuria-in-pregnancy>
5. Palazzi D, Campbell J. Acute simple cystitis in children older than two years and adolescents: Management - UpToDate. UpToDate. June 10, 2025. Accessed July 13, 2025. <https://www.uptodate.com/contents/acute-simple-cystitis-in-children-older-than-two-years-and-adolescents-management>
6. Barola S, Grossman OK, Abdelhalim A. Urinary Tract Infections In Children. National Library of Medicine. January 11, 2024. Accessed July 13, 2025. <https://www.ncbi.nlm.nih.gov/books/NBK599548/>
7. Sekhon P, Marsden J. Urinary Tract Infection (Adult) – Diagnosis. Emergency Care BC. December 11, 2019. Accessed August 4, 2025. https://emergencycarebc.ca/clinical_resource/clinical-summary/urinary-tract-infection-adult-diagnosis/
8. Bugs&Drugs. Cystitis - Females/Healthy Males - First episode. Alberta Health Services. July 31, 2025. Accessed August 4, 2025. <https://www.bugsanddrugs.org/7399B374-C9F6-4044-9E03-86B1D11F2874>
9. UpToDate Lexidrug. Ciprofloxacin (systemic): Drug information - UpToDate. UpToDate. Accessed July 13, 2025. <https://www.uptodate.com/contents/ciprofloxacin-systemic-drug-information>
10. Robinson JL, Finlay JC, Lang ME, Bortolussi R. Urinary tract infection in infants and children: Diagnosis and management | Canadian Paediatric Society. Canadian Paediatric Society. 2014. Accessed July 13, 2025. <https://cps.ca/en/documents/position/urinary-tract-infections-in-children>
11. Hazard Vallerand A, Sanoski C. *Davis Drug Guide for Nurses*. 19th ed. Unbound Medicine, Inc; 2025.
12. Bugs&Drugs. Cystitis - Pediatrics. Alberta Health Services. 2025. Accessed November 5, 2025. <https://www.bugsanddrugs.org/E986ED7F-83C1-4177-809D-19CE1C6C1D53>
13. Lexidrug. Acetaminophen (paracetamol): Pediatric drug information. UpToDate. 2025. Accessed February 25, 2025. <https://www.uptodate.com/contents/acetaminophen-paracetamol-pediatric-drug-information>
14. Lexidrug. Ibuprofen: Pediatric drug information. UpToDate. 2025. Accessed February 25, 2025. <https://www.uptodate.com/contents/ibuprofen-pediatric-drug-information>
15. Briggs G, Freeman R, Towers C, Forinash A. *Briggs Drugs in Pregnancy and Lactation*. 12th ed. Wolters Kluwer Health; 2021.
16. Shaikh N, Hoberman A. Patient education: Urinary tract infections in children (Beyond the Basics) - UpToDate. UpToDate. December 12, 2023. Accessed July 13, 2025. <https://www.uptodate.com/contents/urinary-tract-infections-in-children-beyond-the-basics>
17. Gupta K. Patient education: Urinary tract infections in adults (Beyond the Basics) - UpToDate. UpToDate. May 30, 2025. Accessed July 13, 2025. <https://www.uptodate.com/contents/urinary-tract-infections-in-adults-beyond-the-basics>
18. Sekhon P, Marsden J. Uncomplicated UTI/Cystitis – Management. Emergency Care BC. June 18, 2020. Accessed July 13, 2025. https://emergencycarebc.ca/clinical_resource/clinical-summary/uncomplicated-uti-cystitis-management/



19. Shaikh N, Hoberman A. Urinary tract infections in children: Epidemiology and risk factors - UpToDate. UpToDate. April 1, 2025. Accessed July 13, 2025. <https://www.uptodate.com/contents/urinary-tract-infections-in-children-epidemiology-and-risk-factors>
20. Shaikh N, Hoberman A. Urinary tract infections in children: Long-term management and prevention - UpToDate. UpToDate. July 10, 2025. Accessed July 13, 2025. <https://www.uptodate.com/contents/urinary-tract-infections-in-children-long-term-management-and-prevention>
21. BCCNM. Acting Within Autonomous Scope of Practice (Certified Practice). BCCNM. Accessed June 28, 2025. <https://www.bccnm.ca/RN/PracticeStandards/Pages/CPAutonomousSoP.aspx>