This decision support tool is based on best practice as of October 2016. For more information or to provide feedback on this or any other decision support tool, e-mail certifiedpractice@crnbc.ca

ADULT LOWER URINARY TRACT INFECTION (UTI)

DEFINITION

Bacterial infection of the bladder, also known as cystitis, caused by bacteria multiplying in the urine.

Uncomplicated UTIs are acute infections of the bladder in otherwise healthy women.

UTIs are considered complicated in the following circumstances:

- all UTIs in men,
- anatomic or functional abnormalities of the GU system such as obstruction, neurogenic bladder, stones, prostatic hypertrophy, vesicoureteral reflux;
- long term catheterization or recent GU instrumentation;
- treatment for a UTI within the previous month;
- renal failure, poorly controlled diabetes or clients who are immunocompromised.

POTENTIAL CAUSES

- *Escherichia coli (E. coli)* is the most common organism in 80-90% of cases.
- *Staphylococcus saprophyticus*
- Other enterobacteria

PREDISPOSING RISK FACTORS

- Female gender
- Sexual activity
- Previous UTIs
- Pregnancy
- Use of spermicides, diaphragm
- Infrequent voiding
- Dehydration
- Urinary instrumentation (e.g., catheterization)
- Renal calculi
- Immunocompromised (e.g., HIV infection)

CRNBC monitors and revises the CRNBC certified practice decision support tools (DSTs) every two years and as necessary based on best practices. The information provided in the DSTs is considered current as of the date of publication. CRNBC-certified nurses (RN(C) s are responsible for ensuring they refer to the most current DSTs.

The DSTs are not intended to replace the RN(C)'s professional responsibility to exercise independent clinical judgment and use evidence to support competent, ethical care. The RN(C) must consult with or refer to a physician or nurse practitioner as appropriate, or whenever a course of action deviates from the DST.

THIS DST IS FOR USE BY REGISTERED NURSES CERTIFIED BY CRNBC

© CRNBC October 2016/Pub. 738

- Diabetes mellitus
- Genito-urinary tract anomalies – congenital, urethral stricture, neurogenic bladder, tumor
- Male specific factors are insertive anal intercourse, intercourse with a female with a UTI, lack of circumcision, and prostatic hypertrophy.

TYPICAL FINDINGS

- Frequency
- Urgency
- Dysuria
- Mild dehydration
- Afebrile
- Suprapubic discomfort
- Bladder spasm
- Foul smelling urine
- Hematuria

PHYSICAL ASSESSMENT

Vitals

- Temperature
- Pulse
- Respiratory rate
- SpO2
- Blood pressure

General

- Hydration status
- Suprapubic tenderness – may be mild to moderate
- Flank pain - if present refer or consult as suggests ascending infection
- Costo-vertebral angle (CVA) percussion – presence of tenderness suggests ascending infection. If present, consult with or refer to a physician or nurse practitioner.

Note: In the elderly, symptoms do not always follow the classic triad of urgency, frequency and dysuria. Look for subtle cognitive changes and predisposing factors.

© CRNBC October 2016/Pub. 738

Sexually active Female

- Perform a pelvic exam and full STI screening if abnormal vaginal discharge or symptoms suggestive of vaginitis or STI are present. If appropriate, offer STI screening (see below).

Sexually active Male

- Assess for urethral symptoms, discharge or genital lesions. If present, offer full STI screening (see below).

Diagnostic tests

- Urinalysis
- Dipstick test: blood, protein, nitrites, leukocytes
- Consider microscopic urinalysis: WBC, RBC, bacteria
- Urine culture & sensitivity (C&S) is generally not required with uncomplicated UTI – collect a urine C&S prior to antibiotic commencement if;
    - this is a complicated UTI,
    - this is suspected treatment failure,
    - this is the second presentation of a UTI within a one-year time-frame,
    - the client presents with fever, chills, rigor, or flank pain (and refer or consult),
    - dipstick test is negative and symptoms are indicative of a likely UTI.

NB – ensure sensitivity of organism to the chosen antibiotic once C&S results are returned.

If resistant, consult with or refer to a physician or nurse practitioner.

- For complicated UTIs, ensure C&S done 1-2 weeks after antibiotics are completed
- If symptoms or history indicate, offer full STI screening as per Reproductive Health Certified Practice STI Assessment DST. If full STI screening declined, obtain a urine specimen for CT/GC NAAT
- Consider urine pregnancy test if indicated

Note 1: If urinary frequency, urgency or dysuria and dipstick is positive for leukocytes and/or nitrites, may treat as lower UTI.

Note 2: If necessary, utilize both the UTI DST and appropriate STI DST as there may be more than one condition present (e.g. UTI and STI).

© CRNBC October 2016/Pub. 738

MANAGEMENT AND INTERVENTIONS

Goals of treatment

- Relieve symptoms
- Prevent ascending infection
- Eradicate infection

Non-pharmacological Interventions

- Rest if febrile
- Keep hydrated, increase fluids

Pharmacological interventions

Antibiotics – Females – uncomplicated UTI

First Choice

- nitrofurantoin (monohydrate/macrocrystal formulation - Macrobid) 100 mg, po bid for 5 days

OR

- nitrofurantoin (macrocrystal formulation - Macrodantin) 50-100 mg, po qid for 5 days

Second choice

- trimethoprim 160 mg / sulphamethoxazole 800 mg, 1 tab po bid for 3 days

Third choice

- cefixime 400 mg po daily for 5-7 days

Antibiotics – Complicated UTI – (if systemically well and afebrile)

(All men are considered complicated)

- Trimethoprim 160 mg / sulfamethoxazole 800 mg, 1 tab po bid for 7-14 days

OR

- Amoxicillin-clavulanate 875 mg po BID for 7-14 days

OR

- Cefixime 400 mg po daily 7-14 days (if reduced renal function, dosage may need adjustments)

Antibiotics - Pregnant or Breast Feeding Women

- nitrofurantoin (monohydrate/macrocrystal formulation - Macrobid) 100 mg po bid for 7 days **(do not use in third trimester or labour)**

OR

- nitrofurantoin (macrocrystal formulation - Macrodantin) 50-100 mg po qid for 7 days **(do not use in third trimester or labour)**

© CRNBC October 2016/Pub. 738

OR

- Cefixime 400 mg po daily for 7 days

DO NOT USE **trimethoprim 160 mg / sulfamethoxazole 800 mg.**

POTENTIAL COMPLICATIONS

- Ascending infection (pyelonephritis)
- Chronic cystitis

CLIENT EDUCATION AND DISCHARGE INFORMATION

- Advise on condition, timeline of treatment and expected course of disease process
- Return to clinic if fever develops or symptoms do not improve in 48-72 hours
- Counsel client about appropriate use of medications (dose, frequency, side effects, need to complete entire course of medications)
- Recommend increasing fluid intake to 8-10 glasses per day
- Sitting in a warm tub may relieve symptoms of dysuria
- For women, advise regarding wiping front to back after a bowel movement
- Do not use douches
- Avoid bubble baths
- Advise that voiding after intercourse may be beneficial
- Use appropriate cleaning for sex toys and advise against sharing sex toys
- Advise alternative contraceptives, avoid spermicides

MONITORING AND FOLLOW-UP

- If symptoms do not begin to resolve in 48-72 hours or if symptoms progress despite treatment, client should return to the clinic for reassessment.
- Pregnant women who present with symptoms of UTI are recommended to have a urinalysis and C&S monthly.

CONSULTATION AND/OR REFERRAL

- Presence of complicating factors suggestive of upper urinary tract infection (fever (>38’ C), chills, flank pain, CVA tenderness, nausea and vomiting).
- Women presenting with a third UTI within two months or more than three in one year should be referred to a physician or nurse practitioner.

© CRNBC October 2016/Pub. 738

- Men who present with an uncertain cause or more than one UTI should be referred to a physician or nurse practitioner for further evaluation.
- Men ≥ 50 years of age who present with a true (culture-positive) urinary tract infection for the first time should be referred to a physician or nurse practitioner for further evaluation.

DOCUMENTATION

- As per agency policy

REFERENCES

For help obtaining any of the items on this list, please contact CRNBC Helen Randal Library at circdesk@crnbc.ca

More recent editions of any of the items in the Reference List may have been published since this DST was published. If you have a newer version, please use it.

Anti-Infective Review Panel. (2012). *Anti-infective guidelines for community-acquired infections*. Toronto, ON: MUMS Guideline Clearinghouse.

Blondel-Hill, E., & Fryters, S. (2012). *Bugs and drugs*: *An antimicrobial infectious diseases reference.* Edmonton, AB: Alberta Health Services.

British Columbia Centre for Disease Control. (2013). *Antimicrobial resistance trend in the province of British Columbia.* Vancouver, BC: Author. Retrieved from http://www.bccdc.ca/resource-gallery/Documents/Statistics%20and%20Research/Statistics%20and%20Reports/Epid/Antibiotics/AMR2013ReportFINAL.pdf

Brusch, J. L. (2015, August 19).*Cystitis in females.* Retrieved from http://emedicine.medscape.com/article/233101-overview

Canadian Pharmacists Association. (2014). *Therapeutic choices* (7th ed.). Ottawa, ON: Author.

Car, J. (2006). Urinary tract infections in women: Diagnosis and management in primary care. *BMJ, 332*(7533), 94-97.

Cash, J. C., & Glass, C. A. (Eds.). (2014). *Family practice guidelines* (3rd ed.). New York, NY: Springer.

Chen, Y. A., & Tran, C. (Eds.). (2011). *The Toronto notes 2011: Comprehensive medical reference and review for the Medical Council of Canada Qualifying Exam Part 1 and the United States Medical Licensing Exam Step 2* (27th ed.). Toronto, ON: Toronto Notes for Medical Students.

© CRNBC October 2016/Pub. 738

Christiaens, T. C. M., De Meyere, M., Verschraegan, G. Peersman, W., Heytens, S., & De Maeseneer, J. M. (2002). Randomised controlled trial of nitrofurantoin versus placebo in the treatment of uncomplicated urinary tract infection in women. *British Journal of General Practice, 52*(482), 729-734.

Colgan, R., & Williams, M. (2011). Diagnosis and treatment of acute uncomplicated cystitis. *American Family Physician, 84*(7), 771-776. Retrieved from http://www.aafp.org/afp/2011/1001/p771.html

Dains, J. E., Baumann, L. C., & Schiebel, P. (Eds.). (2015). *Advanced health assessment and clinical diagnosis in primary care.* St. Louis, MO: Elsevier. Retrieved from https://books.google.ca/books?id=WWGuCAAAQBAJ&dq=Advanced+health+assessment+and+clinical+diagnosis+in+primary+care+5th+edition&source=gbs_navlinks_s

DynaMed. (2013, December 17). *Clinical prediction of urinary tract infection (UTI)*. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=dme&AN=474315

DynaMed. (2015, November 19). *Uncomplicated urinary tract infection (UTI)(pyelonephritis and cystitis).* Retrieved from http://web.a.ebscohost.com/dynamed/detail?sid=719ff818-b435-4b9e-99a8-a196dde3a693%40sessionmgr4002&vid=3&hid=4201&bdata=JnNpdGU9ZHluYW1lZC1saXZlJnNjb3BlPXNpdGU%3d#AN=116894&db=dme

DynaMed (2015, December 29). *Complicated urinary tract infection (UTI).* Retrieved from http://web.a.ebscohost.com/dynamed/detail?sid=719ff818-b435-4b9e-99a8-a196dde3a693%40sessionmgr4002&vid=4&hid=4201&bdata=JnNpdGU9ZHluYW1lZC1saXZlJnNjb3BlPXNpdGU%3d#AN=114928&db=dme

Fihn, S. D. (2003). Acute uncomplicated urinary tract infection in women. *New England Journal of Medicine, 349*(3)*,* 259-266.

Grude, N., Tveten, Y., Jenkins, A., & Kristiansen, B. (2005). Uncomplicated urinary tract infections: Bacterial findings and efficacy of empirical antibacterial treatment. *Scandinavian Journal of Primary Health Care, 23,* 115-119. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=ccm&AN=2009407087&site=ehost-live

Guidelines and Protocols Advisory Committee. (2009). *Macroscopic and microscopic urinalysis and the investigation of urinary tract infections*. Victoria, BC: Author. Retrieved from http://www.bcguidelines.ca/pdf/urinalysis.pdf

Gupta, K., Hooton, T. M., Naber, K. G., Wullt, B., Colgan, R., Miller, L. G.,…Soper D. E. (2011). International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: A 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. *Clinical*

© CRNBC October 2016/Pub. 738

Infectious Diseases, 52(5), e103-e120. Retrieved from http://www.idsociety.org/uploadedFiles/IDSA/Guidelines-Patient_Care/PDF_Library/Uncomp%20UTI.pdf

Health Canada, First Nations and Inuit Health Branch. (2012, November). *Clinical practice guidelines for nurses in primary care: Adult care*. Retrieved from http://www.hc-sc.gc.ca/fniah-spnia/services/nurs-infirm/clini/adult/index-eng.php

Iravani, A., Klimberg, I., Briefer, C. Munera, C., Kowalsky, S.F., Echols, R.M. & The Urinary Tract Infection Group (1999). A trial comparing low-dose, short-course ciprofloxacin and standard 7 day therapy with co-trimoxazole or nitrofurantoin in the treatment of uncomplicated urinary tract infection. *Journal of Antimicrobial Chemotherapy, 43*(Supplement A), 67-75.

Jackson, M. A. (2007). Evidence-based practice for evaluation and management of female urinary tract infection. *Urologic Nursing*, *27*(2), 133-136. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=ccm&AN=2009583511&site=ehost-live

Jensen, B., & Regier, L. D. (Eds.). (2014). *RxFiles: Drug comparison charts* (10th ed.). Saskatoon, SK: RxFiles.

Johnson, E. K. (2015). *Urinary tract infections in pregnancy.* Retrieved from http://emedicine.medscape.com/article/452604-overview

Larochelle, A., & Epp, A. (2010). Recurrent urinary tract infection. *The Society of Obstetrics and Gynecologists of Canada* (Vol. 250). Ottawa, ON: SOGC. Retrieved from https://sogc.org/wp-content/uploads/2013/01/gui250CPG1011E_001.pdf

Lee, M., Bozzo, P., Einarson, A., & Koren, G. (2008, June). *Urinary tract infections in pregnancy*. Retrieved from http://www.motherisk.org/women/updatesDetail.jsp?content_id=882

Milo, G., Katchman, E., Paul, M., Christiaens, T., Baerheim, A., & Leibovici, L. (2009). Duration of antibacterial treatment for uncomplicated urinary tract infection in women (review). *Cochrane Database of Systematic Reviews*, (1).

Shah, C., & Goundrey-Smith, S. (2013). Managing the symptoms of urinary tract infection in women. *Journal of Community Nursing, 27*(4), 88-92. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&AuthType=cpid&custid=s5624058&db=ccm&AN=2012314238&site=ehost-live

© CRNBC October 2016/Pub. 738

University of Michigan Health System. (2014, September). *Urinary tract infection*: *Guidelines for clinical care: Ambulatory* (Rev.). Ann Arbor, MI: Author. Retrieved from http://www.med.umich.edu/1info/fhp/practiceguides/uti/uti.pdf

© CRNBC October 2016/Pub. 738