

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

PEDIATRIC LOWER URINARY TRACT INFECTION (UTI)

DEFINITION

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

- UTI is the most common Genito-Urinary (GU) disease in children and the most consistently missed serious bacterial infection in infants.
- During infancy (less than 1 year of age), UTI's occur more frequently in boys, but after that time they occur more frequently in girls.
- In boys, a UTI that occurs after infancy is usually due to a congenital anomaly and requires a referral for investigation.
- Nurses with Remote Practice Certified Practice designation (RN(C)s¹) are able to treat children with UTIs who are **2 years of age and older**. Younger children require consultation with or referral to a physician or nurse practitioner.

Potential Causes

- *E. coli*
- Klebsiella
- Group B Streptococcus
- Proteus
- *Staphylococcus epidermis*
- Pseudomonas
- *H. influenza*
- Enterococcus
- *Staphylococcus saprophyticus*

Predisposing Risk Factors

- Gender – as or more common in boys as neonates
 - after neonatal period, incidence higher in females

¹ RN(C) is an [authorized title](#) recommended by CRNBC that refers to CRNBC-certified RNs, and is used throughout this Decision Support Tool (DST).

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.

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- Genito-urinary tract anomalies – congenital (vesico-ureteral reflux), urethral stricture, neurogenic bladder, tumour
- Bowel and/or bladder dysfunction, such as infrequent voiding, constipation
- Dehydration
- Previous UTIs
- Sexual activity
- Pregnancy
- Use of spermicides, diaphragm
- Urinary instrumentation (e.g., catheterization)
- Immunocompromise
- Diabetes mellitus
- Male specific factors are insertive anal intercourse, intercourse with a female with a UTI, and lack of circumcision

Typical Findings (Depends on the Age of the Child)

History for Neonates and Infants

- Non-specific, non-urinary symptoms
- May present with sepsis
- Fever
- Irritability
- Poor feeding
- Vomiting
- Diarrhea or constipation
- Jaundice
- Hypothermia
- Failure to thrive
- Decreased activity, lethargy

History for children less than 3 years old

- Abdominal pain
- Fever
- Vomiting
- Frequency, urgency, dysuria, new onset enuresis
- Strong smelling urine
- Urinary retention

History for children 3 years of age or older

- Frequency
- Dysuria
- Urgency
- Enuresis

- Flank or back pain (upper UTI)
- Vomiting
- Fever

PHYSICAL ASSESSMENT

Vital signs

- Temperature
- Pulse
- Respiration
- SpO₂
- Blood pressure (BP)

General

- Hydration status
- Weigh until 12 years of age for medication calculations
- May or may not look ill
- Fever
- Jaundice (neonates)
- Suprapubic tenderness
- Tender abdomen (may need to include reproductive assessment in adolescents)
- Costo-Vertebral Angle (CVA) percussion – presence of tenderness suggests ascending infection
- State of circumcision - male

Sexually active Female

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

Reminder: a referral to a physician or nurse practitioner is required for a pelvic exam for any female who has not been sexually active or any female less than 14 years of age.

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: White Blood Cells (WBC), Red Blood Cells (RBC), bacteria
- Urine Culture & Sensitivity (C&S) is generally not required with uncomplicated UTI – consider a urine C&S if:

- 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
- If symptoms or history indicate, offer full STI screening as per Reproductive Health Certified Practice – Sexually Transmitted Infections [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 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).

Management and Interventions

Goals of treatment

- Relieve symptoms
- Eradicate infection
- Prevent recurrence
- Identify underlying factors
- Prevent complications

Non-pharmacological Interventions

- Rest, if febrile
- Keep hydrated, increase fluids

PHARMACOLOGICAL INTERVENTIONS

All drugs must be calculated by weight until age 12 yrs of age. Doses should never exceed adult doses

Antibiotics: Treat only if Routine and Microscopic (R&M) results are positive for nitrites, leukocyte esterase, protein or blood

Children 2 years and older

- Cefixime 8 mg/kg/day PO divided BID for 3 days
- OR
- if weight appropriate and able to swallow nitrofurantoin tabs, Nitrofurantoin (Macrochantin) 5-7 mg/kg/day PO divided QID for 3 days

Second Line

- Trimethoprim 8 mg/ml - Sulfamethoxazole 40mg/ml. 6-12 mg / kg per day po bid for 3 days. **Dosing is based on Trimethoprim**

OR

- Amoxicillin – Clavulanate 40 mg/kg/day po divided tid for 3 days.
- **Dosing is based on the Amoxicillin component**

For Pregnant and Breastfeeding Youth

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

OR

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

OR

- Cefixime 400 mg PO daily for 7 days.

DO NOT USE Trimethoprim 160 mg / Sulphamethoxazole 800 mg**Consult with a physician or nurse practitioner if client allergic to the above medications.****Potential Complications**

- Recurrent UTI
- Sepsis (in neonates and infants)
- Pyelonephritis
- Renal scarring
- Meningitis

Client/Caregiver Education and Discharge Information

- Advise on condition, timeline of treatment and expected course of disease process
- Return to clinic if fever continues or symptoms do not improve in 2 days
- Counsel parent or caregiver about appropriate use of medications (dose, frequency, side effects, need to complete entire course of medications)
- Increase fluid intake while child is unwell (1.5 times usual intake)
- Sitting in a warm tub may relieve symptoms of dysuria
- For females, advise regarding wiping front to back after a bowel movement
- Do not use douches
- Avoid bubble baths
- If sexually active, advise that voiding after intercourse may be beneficial
- Use appropriate cleaning for sex toys and advise against sharing sex toys

Monitoring and Follow-Up

- Follow up in 24-48 hours, make sure that antibiotics are sensitive to organisms
- If symptoms progress despite treatment, client should return to the clinic for reassessment and consultation with a physician or nurse practitioner
- Arrange follow up for one week after the completion of therapy
- Discuss follow-up urinalysis with physician or nurse practitioner

Consultation and/or Referral

- All infants less than 4 months of age or who look acutely ill must be referred to a physician or nurse practitioner
- Consult a physician or nurse practitioner for treatment failure after 72 hours
- Children presenting with symptoms of pyelonephritis such as high fever, abdomen, flank and CVA tenderness must be referred to a physician or nurse practitioner
- Following the first UTI, all children should be referred to a physician or nurse practitioner as they may require further investigation to rule out a congenital anomaly such as vesico-ureteral reflux

DOCUMENTATION

As per agency policy

REFERENCES

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.

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