# Urinary Tract Infection

## *Executive Summary*

## Introduction

Urinary tract infection (UTI) is the most common bacterial disease in childhood. Incidence is high among febrile children and recurrence is also common (up to 50%). It is also one of the most commonly diagnosed infections in both hospitalized and community-dwelling older adults. The definition of symptomatic UTI in adults generally requires the presence of localized genitourinary symptoms caused by bacteria present in the urine. In children, UTIs are associated with primary vesico-ureteral reflux; the resulting reflux nephropathy (renal scars) is a possible cause of childhood hypertension and chronic kidney disease.

This guideline covers management of uncomplicated and complicated UTI in all age groups and pregnant women.

## Target users

* Nurses
* Doctors

## Target area of use

* Gate Clinic
* Outpatient Department
* Ward

## Key areas of focus / New additions / Changes

This guideline describes the features of UTI in different clinical populations and stratifies the treatment accordingly.

Diagnosis of UTI is particularly challenging in children. Dipstick urine testing is useful in children and non-pregnant women. Non-pregnant women with multiple UTI features can receive empirical therapy without dipstick testing. Urine microscopy, culture and sensitivity can provide definitive diagnosis and guide antibiotic therapy.

Most UTI can be treated on outpatient basis with oral antibiotics. However, complicated or severe infections require inpatient therapy with parenteral antibiotics.

## Limitations

Urine culture and sensitivity are currently available only at Fajara. In addition, patients requiring prolonged in-patient care for pyelonephritis or complicated UTI cannot be managed at Keneba or Basse.

## Presenting symptoms and signs

Symptoms of lower UTI

* Dysuria
* Frequency of micturition
* Urgency
* Cloudy urine
* Coca-cola coloured urine
* Malodorous urine
* Lower abdominal discomfort
* Rectal pain in men
* New onset of incontinence and/or enuresis

Symptoms of an upper tract UTI include:

* Pain and in the upper back and sides
* Chills
* Fever
* Nausea
* Vomiting

Patients with fever, back pain or flank pain may have pyelonephritis and should be referred to the doctor.

The presence of vaginal itch or discharge make another diagnosis more likely. Patients with these symptoms need a speculum and pelvic examination. Refer to the doctor if you cannot do this.

Elderly patients are more difficult to diagnose – so if you are unsure refer them to the doctor.

Infants and young children: Findings are typically non-specific in infants and young children. Unexplained high fever is the most common presenting symptom for UTI in infants. Others may include fever, malaise, vomiting, lethargy, irritability, poor feeding and abdominal pain. Symptoms become more specific as the child grows older.

Generally, female sex is a major risk factor for UTI but uncircumcised male infants have even higher risk due to physiologic phimosis.

Constipation is a risk factor for UTI in young children and should be specifically asked about.

## Examination findings

Patients with uncomplicated UTI may appear uncomfortable but typically are not toxic. Suprapubic tenderness may be present. The presence of toxic signs such as fever, chills, nausea, and vomiting suggests pyelonephritis. Costovertebral tenderness also suggests pyelonephritis.

**Important things to look for**

* Costovertebral tenderness
* Suprapubic tenderness
* Features of Chronic Kidney Disease
* High blood pressure

**Differential diagnoses**

* Nephrolithiasis
* Appendicitis
* Glomerulonephritis
* Urethritis
* Gastroenteritis
* Schistosomiasis

## Investigations

* Dipstick Urinalysis: Nitrite and leucocyte esterase are the most useful markers. Haematuria and proteinuria may be present.
* Urine microscopy, culture and sensitivity:
  + Asymptomatic bacteriuria is defined as the presence of bacteria in the urine in quantities of 105 colony forming units per milliliter or more in 2 consecutive urine specimens in women or 1 urine specimen in men in the absence of clinical signs and symptoms suggestive of a UTI. It is more common in older women and in diabetic patients. This does not necessarily lead to illness and does not need to be treated except in pregnant women.
* Full Blood Count: useful in complicated UTI, pyelonephritis.

## Management in Gate Clinic

Advise all patients to drink plenty of water.

### Non-pregnant women (16 years and older)

Women with dysuria and frequency or who have 3 or more symptoms of UTI (and no symptoms of pyelonephritis) can be diagnosed clinically without any further investigation. Treat with nitrofurantoin 100 mg BD for 3 days.

Women with 1 or 2 symptoms of UTI should provide a urine sample for dipstick. Any symptomatic woman whose dipstick is positive for leukocytes or nitrites should be treated for UTI as above.

### Pregnant women

Urine dipstick is not sufficiently sensitive for UTI in pregnant women. Women with symptoms of UTI should be treated with nitrofurantoin 100 mg BD for 7 days. Oral amoxicillin 500 mg TDS for 7 days is preferable for pregnant women already at term.

A urine sample should be sent to the lab for MC&S. Ask the patient to return to the clinic after the course of antibiotics. A further urine MC&S should be sent to ensure the infection has been cured.

### Men (16 years and older)

Urine dipstick is not useful in men. Send a sample of urine for MC&S. Treat empirically with Ciprofloxacin 500 mg BD for 10 days. Ask the patient to return after this if they are not better. *Refer* the patient to the doctor if they return.

### Children (<16 years)

Children under 3 months should be *referred* to the doctor.

Children over 3 months, but under 3 years who have specific urinary symptoms should be assumed to have a UTI. Urine should be sent for MC&S. Treat as described below. *Refer* other children in this age group to the doctor.

Children over 3 years old in whom UTI is suspected should provide a urine sample for dipstick. If the dipstick is positive for nitrites and leukocytes, treat for UTI. If it is positive for nitrites alone, treat but also send a sample for MC&S. If the dipstick is either positive only for leukocytes or negative, then *refer* to the doctor.

Treat children with amoxicillin 30 mg/kg (max 500 mg) TDS for 3 days. Tell the carer to bring the child back if they do not improve with this treatment. *Refer* all returning children to the doctor.

**Refer to the Doctor in OPD if:**

* patients with signs of pyelonephritis: fever, back pain or flank pain.
* women with vaginal itch or discharge.
* elderly patients where the diagnosis is not clear.
* all children under 3 months
* children over 3 months and under 3 years where the diagnosis is not clear.
* children over 3 years whose urine dipstick is not positive for nitrites.
* all patients who return to the clinic because their symptoms have not resolved with first line treatment.

## Management in OPD

**Children between 3 months and 3 years:**

Treat UTI if either nitrite or leucocyte esterase is positive. Review with urine MC&S.

**Children over 3 years with negative nitrite on dipstick**

If leucocyte esterase is also negative, do not treat as UTI and do not send sample for urine MC&S. Explore alternative diagnoses.

If leucocyte esterase is positive, send a sample for urine MC&S. Consider starting antibiotics only if the child also has definite and specific UTI symptoms.

**Pyelonephritis:**

Commence antibiotics after sending samples for urine MC&S. Oral antibiotics are preferred unless the patient cannot tolerate them or is severely ill.

For non-pregnant women and men (16 years and older), give oral ciprofloxacin 500 mg BD for 7 days. Pregnant women should be admitted and given intravenous antibiotics initially.

**Patients returning without improvement:**

Review results of urine MC&S and alter antibiotic prescription accordingly if necessary. Consider alternative diagnosis if culture is negative.

**Children with recurrent UTI:**

A child is considered to have recurrent UTI if they have had 2 UTIs where at least one episode was acute pyelonephritis. Children with 3 or more episodes of lower UTI are also considered as having recurrent UTI. Such patients should receive urinary tract ultrasonography within 6 weeks of resolution of last episode.

## Management on the Ward

Patients should be admitted to the ward if any of the following is present :

* Acutely ill patient / signs of sepsis
* Signs of urinary obstruction or significant underlying disease (such as diabetes, heart failure, chronic lung disease, severe immunosuppression)
* Not tolerating oral fluids or medications
* Infants younger than 3 months with febrile UTI

**Children under 3 months of age**:

Samples should be sent for urine MC&S and a full blood count. Blood culture and a lumbar puncture should be performed before starting on IV/IM Ampicillin and IV Gentamicin. Tailor antibiotic therapy to microbiology results. When the child is afebrile for at least 24 hours, oral antibiotics can then be given to complete 14 days of therapy.

**Pyelonephritis/ Complicated UTIs:**

Send samples for blood culture, urine MC&S and commence empirical parenteral antibiotics. Pregnant patients should receive IV ceftriaxone 1 – 2 g daily. Older children, men and non-pregnant women should be placed on IV Ampicillin 1 g 8 hourly plus IV Gentamicin 5-7.5 mg/kg once daily

Antibiotic regimens should be reviewed using microbiology results. With clinical improvement, patients can be stepped down to oral therapy. Total duration of antibiotic therapy should be 14 days unless other complications occur.

Patients who fail to improve after 48 hours (children) or 72 hours (adults) should receive a urinary tract ultrasound scan.

## Key Issues for Nursing care

* Catheter specimen samples are the best for urine MC&S in children unable to understand instructions. However, where this is not feasible, sterile collection bags/pads can be used.
* Dipstick testing should not be used for detecting urinary tract infections in catheterized adults.

## References

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