**Epidemiology**

* In the United States, urinary tract infections are the most prevalent outpatient infections.
	+ 50-60% of adult women will suffer from at least one UTI in their life.
	+ Within six months, 27% of women will experience a recurrence.

**Risk Factors**

* Pregnancy, sexual activity, age, previous UTI, poor hygiene, prostatic hypertrophy, bowel incontinence, post-menopausal state, diabetes.

**Classification**

* Uncomplicated: Infections that occur in premenopausal women with structurally and functionally normal urinary tracts who are healthy.
	+ Most common pathogen: **E. coli**
* Complicated: Infections are associated with abnormalities of the anatomical or functional urinary tract and/or underlying medical conditions.
	+ Kidney/bladder stone, indwelling catheter, obstruction, pregnancy, males, diabetes, immunosuppression.
	+ Men who have UTIs are considered complicated.
	+ E. coli accounts for 50% of all cases
* Significant bacteriuria: Bacterial counts ≥105 CFU bacteria/mL.
* Asymptomatic bacteriuria: Absence of urinary tract infection (UTI) symptoms when bacteria are present in the urine.
	+ Only pregnant patients and patients undergoing urologic procedures should be treated for asymptomatic bacteriuria.
* Recurrent Infections: Two or more UTIs within six months or three or more UTIs within one year.

**Diagnosis**

**Clinical Presentation**

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| --- | --- |
| Lower UTI* Dysuria (pain or burning on urination)
* Frequency (frequent voiding of small amounts of urine)
* Urgency (need to void immediately)
* Hematuria (blood in urine)
 | Upper UTI* Flank pain
* Fever
* N/V
* Costovertebral tenderness
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* Symptomatic
* Positive UA
* Isolation of significant numbers of bacteria from urine specimen

**Treatment**

|  |  |
| --- | --- |
| OralSulfamethoxazole-TrimethoprimNitrofurantoinFosfomycinLevofloxacinCiprofloxacinAmoxicillin-clavulanateCephalexin | IVAmpicillin-sulbactamPiperacillin-tazobactamCeftriaxoneCefepimeMeropenemLevofloxacinCiprofloxacin |

Uncomplicated Cystitis

1. Sulfamethoxazole-trimethoprim 160/800mg PO BID x 3 days
2. Nitrofurantoin 100 mg PO BID x 5 days
3. Fosfomycin PO in 3 to 4 oz. of water x 1; str and dissolve

Complicated Cystitis – Female

1. Ciprofloxacin IR 250 mg PO q12h
2. Levofloxacin 750 mg PO/IV daily x 5-7 days
3. Ceftriaxone 1 g IV once, followed by appropriate PO therapy x 5-14 days
4. During pregnancy: amoxicillin-clavulanate IR 875 mg BID x 10-14 days

Complicated Cystitis – Male

1. Sulfamethoxazole- Trimethoprim 1 double-strength tablet PO BID x 14 days
2. Levofloxacin 750 mg PO/IV daily x 5-7 days
3. Ciprofloxacin 500 mg PO q12h x 5-7 days or 400 mg IV q12h x 5-7 days
* Repeat cultures at 4 to 6 weeks
* Recurrent infection: treat up to 6 weeks

Complicated Cystitis - Catheter-associated

* Asymptomatic patients: no antibiotic therapy needed. Change catheter and access need for catheter.
* Symptomatic patients: change catheter and treat as a complicated UTI empirically

Uncomplicated - Pyelonephritis

1. Levofloxacin 750 mg PO daily x 7-10 days
2. Sulfamethoxazole-Trimethoprim 1 DS tablet PO daily x 14 days

Complicated - Pyelonephritis

1. Ceftriaxone 1 g IV daily x 14 day
* Once the patient has been afebrile for 24 to 48 hours, may switch from IV to oral therapy to complete the 14-day treatment.

References

1. Medina M, Castillo-Pino E. An introduction to the epidemiology and burden of urinary tract infections. Ther Adv Urol. 2019 May 2;11:1756287219832172. doi: 10.1177/1756287219832172. PMID: 31105774; PMCID: PMC6502976
2. Centers for Disease Control and Prevention. Urinary Tract Infections. Available at: https://www.cdc.gov/antibiotic-use/uti.html. Updated October 6, 2021. Accessed July 12, 2023
3. Bettcher CM, Campbell E, Petty LA, et al. Urinary Tract Infection [Internet]. Ann Arbor (MI): Michigan Medicine University of Michigan; 2021 May. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK572335/>
4. Multiple-Entries. Lexi-Drugs. Lexi-Comp Online. Lexi-Comp, Inc. Hudson, OH. Available
at: http://online.lexi.com/crlonline. Accessed July 12, 2023.