

Wydział Lekarski Collegium Medicum w Bydgoszczy

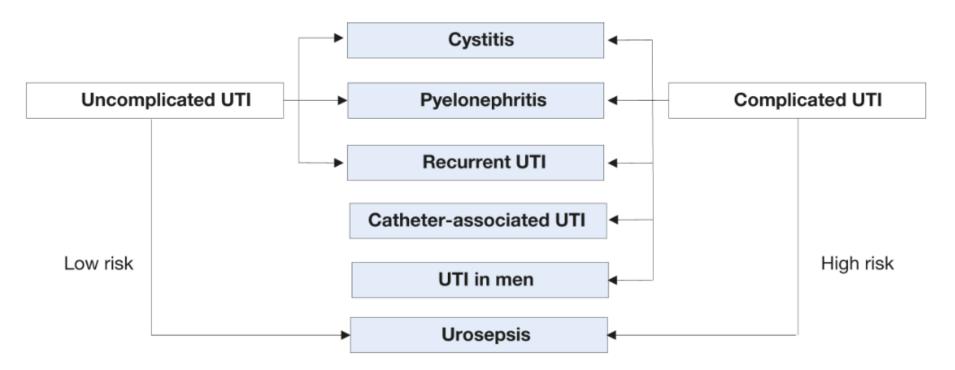


DEFINITION



A urinary tract infection (UTI) is an infection involving any part of the urinary system, including:

- Urethra
- Bladder
- Ureters
- Kidney



Classification of UTI

Uncomplicated UTIs

Complicated UTIs

Catheter-associated UTIs

Urosepsis

Recurrent UTIs

Recurrences of uncomplicated and/or complicated UTIs, with a frequency of at least three UTIs/year or two UTIs in the last six months.

in place within the past 48 hours.

diabetes.

tract or comorbidities.

and/or male genital organs [12].

Acute, sporadic or recurrent lower (uncomplicated cystitis) and/or upper

All UTIs which are not defined as uncomplicated. Meaning in a narrower

all men, pregnant women, patients with relevant anatomical or functional

sense UTIs in a patient with an increased chance of a complicated course: i.e.

abnormalities of the urinary tract, indwelling urinary catheters, renal diseases, and/or with other concomitant immunocompromising diseases for example,

Catheter-associated urinary tract infection (CA-UTI) refers to UTIs occurring in a person whose urinary tract is currently catheterised or has had a catheter

Urosepsis is defined as life threatening organ dysfunction caused by a

dysregulated host response to infection originating from the urinary tract

(uncomplicated pyelonephritis) UTI, limited to non-pregnant women with no known relevant anatomical and functional abnormalities within the urinary

TERMINOLOGY AND DEFINITIONS



Cystitis

infection of the bladder/lower urinary tract

Pyelonehritis

infection of the kidney/ upper urinary tract

Asymptomatic bacteriuria

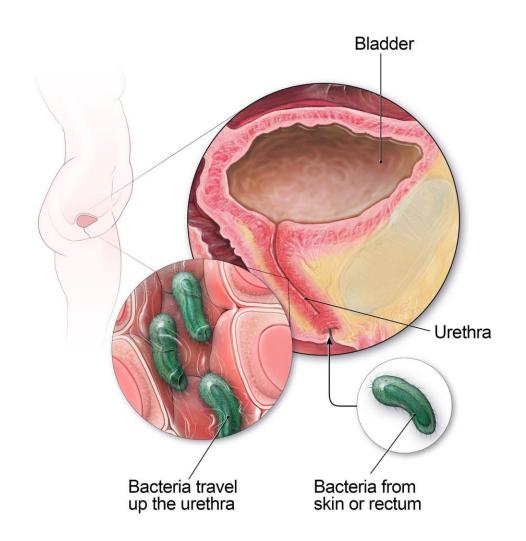
presence of two separate consecutive clean-voided urine specimens with 10^5 or more CFU per mililiter of the same bacteria in the absence of symptoms

PATHOGENESIS OF UNCOMPLICATED UTI



Uropathogens present in rectal flora enter the bladder via the uretra

Increased frequency in women due to smaller distance between anus and urethral meatus



HOST DETERMINANTS



Behavioral

Sexual intercourse

Recent antimicrobial use

Genetic

Innate and adaptive immune system

Increased epithelial adherence of some bacteria

Prior history of recurrent cystitis

Biologic

Post-menopausal state

Glycosuria

HOST DETERMINANTS



Young and pre-menopausal women Post-menopausal and elderly women Sexual intercourse History of UTI before menopause Use of spermicide Urinary incontinence A new sexual partner Atrophic vaginitis due to oestrogen deficiency A mother with a history of UTI Cystocele History of UTI during childhood Increased post-void urine volume Blood group antigen secretory status Blood group antigen secretory status Urine catheterisation and functional status deterioration in elderly institutionalised women

FACTORS ASSOCIATED WITH COMPLICATED UTIS



Common factors associated with complicated UTIs	
Obstruction at any site in the urinary tract	UTI in males
Foreign body	Pregnancy
Incomplete voiding	Diabetes mellitus
Vesicoureteral reflux	Immunosuppression
Recent history of instrumentation	Healthcare-associated infections
Isolated ESBL-producing organisms	Isolated multi-drug resistant organisms

CLINICAL MANIFESTATIONS OF UTI



CYSTITIS

 Dysuria, urgency, frequency, suprapubic pain, hematuria

PYELONEPHRITIS

- Fever, chills, flank pain, costovertebral angle tenderness, nausea/vomiting, pain in lower abdomen
- May not always have symptoms of cystitis

ATYPICAL PRESENTATIONS IN COMPLICATED UTI



Prostatitis in men- symptoms of cystitis accmopanied by pelvic pain

 Elderly- generalized signs/symptoms of infection (fever, chills, altered mental status)

DIAGNOSIS OF UTI- LABORATORY



Urinanalysis/ urine dipstick:

- Leukocyte esterase- indicates white blood cells present in urine
- Nitrites- presence of Gram-negative bacteria (Enterobacteriaceae)

ABUTI



Screening for asymptomatic bacteriuria is strongly recommended in the first trimester of pregnancy because pregnant women are at increased risk of acute pyelonephritis.

Screening is discouraged in most patient populations.

Eradication of the infecting microorganism commonly results in bladder colonization by a more difficult-to-treat pathogen.

ACUTE UNCOMPLICATED CYSTITIS IN YOUNG WOMEN



Uncomplicated cystitis is defined as acute, sporadic or recurrent cystitis limited to non-pregnant women with no known relevant anatomical and functional abnormallities within the urinary tract or comorbidities.

Almost half of all women will experience at least one episode of cystitis during their lifetime.

ACUTE PYELONEPHRITIS



Acute pyelonephritis usually arises from ascent of bacteria from the bladder to the renal medulla. Pyelonephritis in patients with structurally normal urinary tracts is usually caused by uropathogenic E. coli strains.

Fever, flank pain, nausea, and vomiting—with or without symptoms of lower UTI (dysuria, frequency, urgency)—suggest the diagnosis.

Pyuria is nearly always present, and microscopic examination of the urine may reveal WBC casts.



A complicated UTI (cUTI) occurs in an individual in whom factors related to the host or specific anatomical or functional abnormalities related to the urinary tract are believed to result in an infection that will be more difficult to eradicate than an uncomplicated infection.

New insights into the management of cUTIs also suggest to consider infections caused by multi-drug resistant uropathogens.

COMPLICTAED UTI- PROSTATITIS



Acute bacterial prostatitis presents with some combination of fever, dysuria, pelvic or perineal pain, and pyuria.

Occurs in 25% of men during lifetime.

Common microorganisms include Gram-negative bacilli:

- E. coli, Proteus, Klebsiella, P. aeruginosa
- Less likely Enterococci and Staphylococcus aureus

COMPLICTAED UTI- PROSTATITIS



Rectal examination, which is painful and can cause bacteremia, should be avoided when the diagnosis seems straightforward.

Rectal examination often shows a tender and boggy prostate, but findings may be normal.

Urinalyses and urine cultures taken before and after prostate massage can be useful but cannot exclude this diagnosis.

Antimicrobial therapy must be prolonged, **typically for 4 to 12 weeks**, and is made difficult by the poor penetration of many antibiotics into the prostate.

Prostate specific antigen (PSA)



Measurement of free and total PSA adds no practical diagnostic information in prostatitis.

Catheter-associated UTIs



Catheter-associated UTI refers to UTIs occurring in a person whose urinary tract is currently catheterised or has been catheterised within the past 48 hours.

Catheter-associated UTIs are the leading cause of secondary healthcare-associated bacteraemia.

The duration of catheterisation is the most important risk factor for the development of a CA-UTI.

URINARY TRACT INFECTION IN CHILDREN



In first year of life

More common in boys than girls

Associated with congenital abnormalities of the urinary tract

After first year of life

More frequent in girls than boys

Most present acute cystitis