

# Management of UTI

TEAM 439

**MICROBIOLOGY**



# Objectives

- ❖ Recall the principal goal of management of urinary tract infection (UTI) and that antibiotics are the main treatment of UTI.
- ❖ Discuss the factors that management of UTI depends on.
- ❖ Describe the management/treatment of different conditions of UTI ( cystitis, pyelonephritis, catheter associated UTI ,etc.).

## Colour index:

**Red: Important**

Grey: Extra info & explanation.

**Purple: Only in girl's slides.**

**Orange: Only in boy's slides.**

**Green: Lecture notes**

Any future corrections will be in the editing file, so please check it

**frequently.**

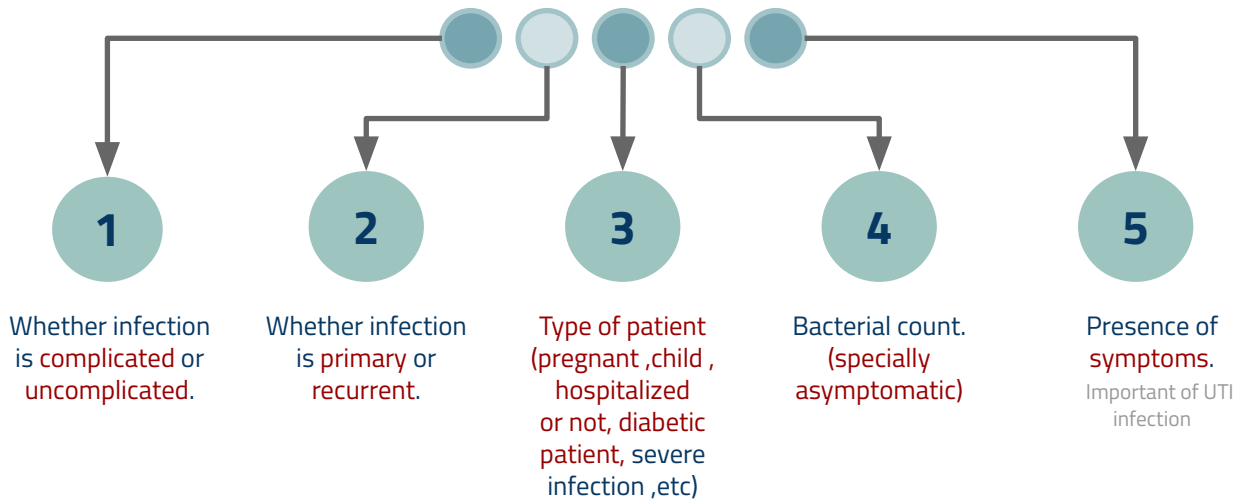
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# Goal of Management of UTI

- ❖ The principal goal of management of UTI is to eradicate the offending organisms from the urinary bladder and tissues.
- ❖ The **main treatment** of UTI is by **antibiotics**.

## Management of UTI depends on:



## Uncomplicated UTI

- ❖ **Low-risk patient (woman)** for recurrent infection: **3 days antibiotic (narrow spectrum, oral)** without urine test. Cure rate 94%.
- ❖ Choice of antibiotic **depend on susceptibility pattern** (when susceptibility test is done) of bacteria, it includes:

**Amoxicillin**

with or without clavulanic acid

**Cephalosporins**

**first** or **second** generation

**TMP-SMX**

trade names: Bactrim, Septra, Cotrimoxazole

**Nitrofurantoin**

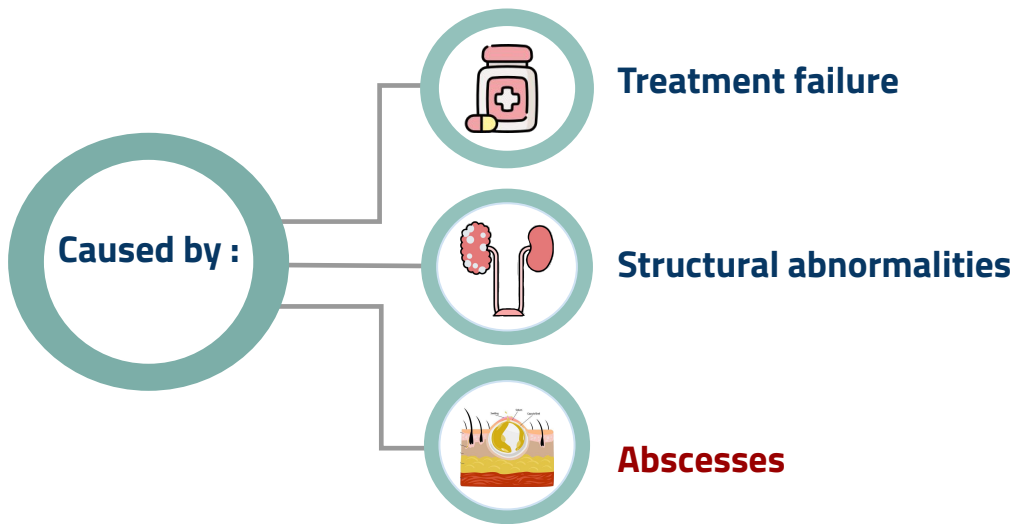
for long term use

**Fluoroquinolone**

**ciprofloxacin** or **norfloxacin** (not for pregnant women or children under 18 year).  
first choice if other antibiotics are resistant.

# Relapsing infection :

Relapse means that there's a treatment failure

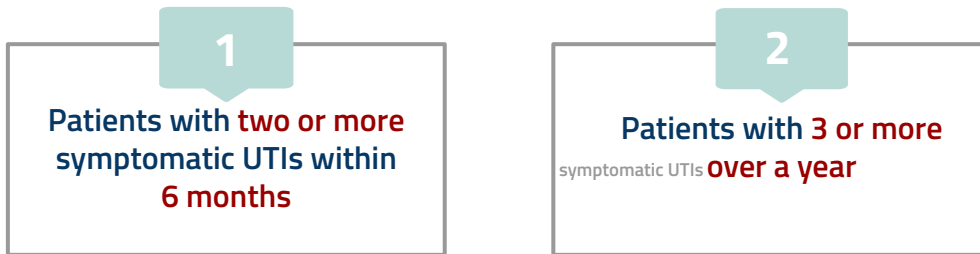


**Treatment:** Antibiotics used at the initial infection for 7-14 days.

- ❖ Needs longer duration of therapy.

# Recurrent infections :

Recurrent means that the patient will recover then get sick again

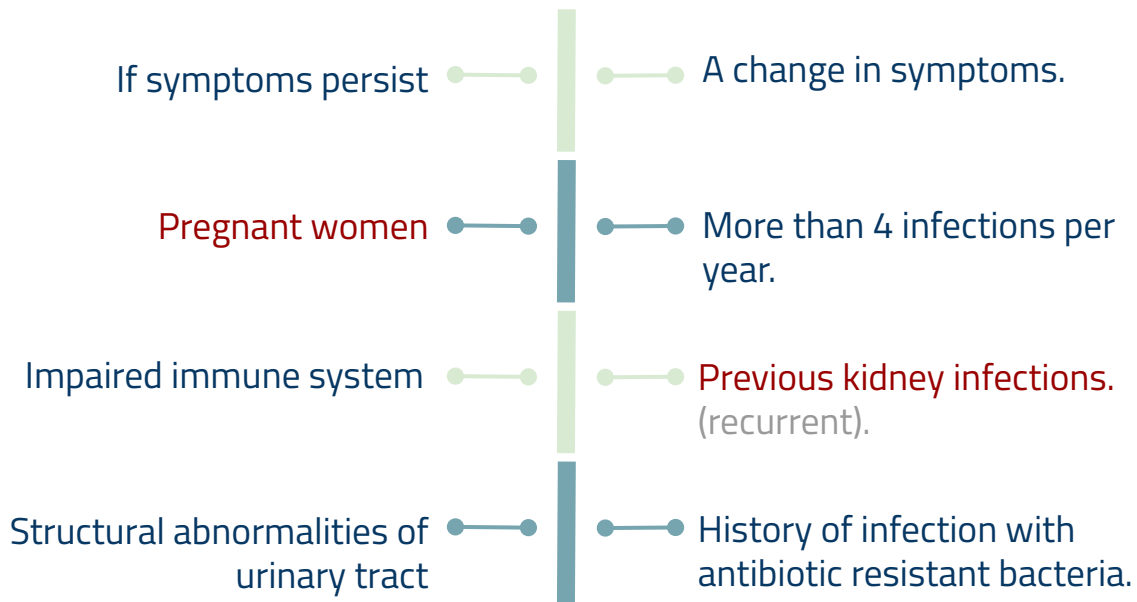


- ❖ Need preventive therapy. (depend on the patient and the organism).
- ❖ Antibiotic taken as soon as symptoms develop.
- ❖ **If infection occurs less than twice a year**, a clean catch urine test should be taken for culture and treated as initial attack for 3 days.

# Complicated UTI :

- ❖ Age.
- ❖ Catheterization.
- ❖ Diabetes mellitus.
- ❖ Spinal cord injury.
- ❖ Comorbidities in paediatric patient.
- ❖ Males.

# When to consult the doctor?



## Prophylactic antibiotics

- ❖ Optional for patients who do not respond to other measures.

general practice such as:

- Diabetes and blood sugar control, hygiene and hydration.

- ❖ Reduces recurrence by up to 95%.

- ❖ Low dose antibiotic taken continuously for 6 months or longer, it includes :

- ★ TMP-SMX
- ★ Nitrofurantoin
- ★ Cephalexin

- ❖ Antibiotic taken at bedtime more effective.

## Uncomplicated

# Pyelonephritis

## Moderate-severe complicated

- ❖ Patients with fever, chills and flank pain but they are **healthy, non-pregnant, female without** relevant comorbidities and without structural or functional urinary tract **abnormalities**.
- ❖ Can be treated at **home** with oral antibiotics for 14 days with one of the below.
- ❖ First dose may be given by injection.
- ❖ Oral: Cephalosporins, Amoxicillin-Clavulanic acid, Ciprofloxacin or TMP-SMX. I.V: Ceftriaxone or Gentamicin then we switch to oral.
- ❖ Patients need **hospitalization**.
- ❖ If fever and back pain **continue after 72 hrs of antibiotic**, imaging tests indicated to exclude abscesses, obstruction or other abnormality.
- ❖ Antibiotics given by IV route for 3-5 days (or more) until symptoms are relieved for 24-48 hrs then we switch to oral.  
-Many options can be used I.V. including Ceftriaxone or Meropenem (carbapenems) for **resistant bacteria**.

## Treatment of specific populations:

### Pregnant Women

- ◆ High risk for UTI (especially pyelonephritis) and Complications.
- ◆ Should be screened for UTI
- ◆ **Antibiotics during pregnancy includes** Amoxicillin, Ampicillin, Cephalosporins, and Nitrofurantoin. (there are many restrictions so we try to choose the narrowest)
- ◆ Pregnant women should **NOT take Quinolones**.



- ◆ Pregnant women with **asymptomatic bacteriuria** (evidence of infection but no symptoms) have 30% risk for acute pyelonephritis in the second or third trimester. **Screening** and 3-7 days antibiotic needed.
- ◆ **Acute cystitis during pregnancy usually treated within 7 days of antibiotics.**

**note:** The two main populations that need to be screened & treated for **asymptomatic bacteriuria** are:

1. Pregnant women 2. Pre Urologic procedure patients

Other patients (even old age or diabetics) that are asymptomatic with bacteriuria are not treated.

## Diabetic patients



Have more **frequent** and **more severe UTIs**.



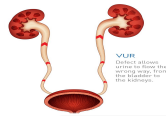
treated for **7-14 days** with antibiotics even patients with uncomplicated infections.

**Note:** Complicated UTIs (including diabetes) take the same medication as uncomplicated but with a longer duration (7-14 days) especially for cystitis.

## Children with UTI

- ❖ Usually treated with **TMP-SMX** or **Cephalexin**. (narrow spectrum)
- ❖ Sometimes given as IV. (if unwell or with pyelonephritis)
- ❖ **Gentamicin** may be **recommended** as **resistance** to **Cephalexin** is increasing. **Ciprofloxacin** (Fluoroquinolones) is **contraindicated** along with Tetracyclines but it is not much used in UTI.
- ❖ In **male children** it is important to look for the underlying cause of the infection. (such as undiagnosed anatomical issues e.g. VUR)

## Vesicoureteric Reflux (VUR)



Common in children with UTI

Can lead to pyelonephritis and kidney damage.

Long-term antibiotic plus **surgery** used to **correct VUR** and prevent infections.

Acute kidney infection: use Cefixime (oral) or IV Ceftriaxone or Gentamicin a one daily dose for 2-4 days followed by oral treatment eg. amoxicillin-clavulanic acid or TMP-SMX .

## Urethritis in men

Symptoms are generally very similar to cystitis with the addition of urethral discharge mostly caused by *N.gonorrhoeae*.

- ❖ Most important causes:
  - *Neisseria gonorrhoeae*
  - *Chlamydia trachomatis*
- ❖ Treated with IM Ceftriaxone + Doxycycline or Azithromycin.
- ❖ Patients should also be tested for accompanying STD.

# Management of catheter induced UTI:

<b>Overview</b>	<ul style="list-style-type: none"><li>❖ Very common.</li><li>❖ Preventive measures.</li><li>❖ Catheter should not be used unless absolutely necessary and they should be removed as soon as possible.</li></ul>
<b>Intermittent use of catheters</b>	<ul style="list-style-type: none"><li>❖ <b>If catheter is required for long it is best to be used intermittently.</b></li><li>❖ May be replaced every two weeks to reduce risk of infection and irrigating bladder with antibiotics between replacements.</li><li>❖ Daily hygiene and use of closed system to prevent infection.</li></ul>
<b>Catheters induced infections</b>	<ul style="list-style-type: none"><li>❖ Catheterized patients who develop UTI with symptoms or at risk for sepsis should be treated for each episode with antibiotics and catheter should be removed, if possible.</li><li>❖ Associated organisms are constantly changing.</li><li>❖ May be multiple species of bacteria.</li><li>❖ Antibiotics use for prophylaxis is <b>rarely</b> recommended since high bacterial counts present and patients do not develop symptomatic UTI.</li><li>❖ <b>Antibiotic therapy has little benefit if the catheter is to remain in place for long period.</b></li></ul>



# SAQ

SAQ1: 30 year old female with frequency and painful urination. urine analysis showed + leukocyte esterase and nitrate .microscopy revealed presence of WBCs and bacteria. what is The diagnosis & management? what if she was diabetic?

SAQ2: 30 year old female with frequency and painful urination. fever and flank pain and tenderness when examining the area. urine analysis showed + leukocyte esterase and nitrate .microscopy revealed presence of WBCs and bacteria. what is The diagnosis & management?

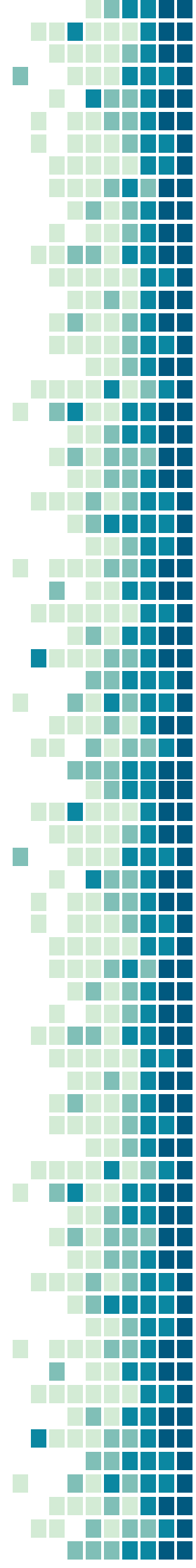
SAQ3: 4 year old male child white pyelonephritis. What's the management? what if he has VUR?

SAQ1: uncomplicated cystitis/3 days of oral antibiotics (narrow spectrum), like amoxicillin and TMP-SMX/long duration of antibiotics (7-14)

SAQ2: uncomplicated pyelonephritis/ oral antibiotic 14 days

SAQ3: I.V antibiotics for treating pyelonephritis/ surgery

# MCQs



Q1: one of the following is contradicted with pregnant & children

- A- Amoxicillin      B- Nitrofurantoin      C- Quinolones      D- TMP-SMX

Q2: )A 3 years old boy came to the ER complaining of severe back pain and painful urination with blood. The boy was given Cephalexin but he developed a bacterial resistant. Which of the following drugs will be given to him for treatment:

- A- TMP-SMX      B- Quinolones      C- Amoxicillin      D- Gentamicin

Q3: A 27-year-old female in her 36th week of pregnancy has routine vaginal and rectal swabs taken for screening of a pathogen which she may carry asymptotically and which is associated with neonatal sepsis, pneumonia, and meningitis. For which pathogen is she being screened?

- A- group B strep      B- N. gonorrhoeae      C- E.coli      D- both A & C

Q4: A 23-year-old female is treated for uncomplicated pyelonephritis with an antibiotic that inhibits bacterial DNA gyrase. Which antibiotic did she receive?

- A- TMP-SMX      B- Ciprofloxacin      C- Ceftriaxone      D- Gentamicin

Q5: Which of the following antibiotics is not suitable as empirical treatment and only used where sensitivity has been confirmed? (**Dr.Fawzia's cases**)

- A- Amoxicillin      B- Nitrofurantoin      C- Ciprofloxacin      D- Trimethoprim

Q6: When we should use catheter with patients?

- A- Anytime      B- Usually      C- When needed      D- None

Q7: Catheter replace every?

- A- Day      B- 12 hours      C- Week      D- Two week

Q8: Patient who develop UTI with symptoms or at risk of sepsis should be treat each episode with antibiotics and?

- A- Catheter use      B- Remove catheter if possible      C- Catheter does not affect antibiotic therapy      D- None

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
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C	D	D	B	A	C	D	B
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# Team Leaders



- Yara Alasmari
- Manee Alkhalifah

## Sub Leader

Mohammed Beyari

## Team Members



- Shahad Almezel
- Abdulaziz Alderaywsh
- Noura Alsalem
- Faisal Alomri
- Ghadah Alsuwailem
- Abdulaziz Alomar
- Noura Alshathri
- Meshal Alhamed
- Rand AlRefaei
- Homoud Algadheb
- Muneerah Alsadhan
-  Abdulaziz Alsuhaim
- Sarah Alaidaroos
- Sara AlQuwayz
-  Sadeem Alhazmi

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