The Egyptian Urological Guidelines

Urinary Tract Infection

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Contents

1 - Acknowledgement.

Steering Panel (in alphabetical order)

1. Prof. Mohamed Sherif Mourad, Ain Shams University (Chair of Panel)
2. Prof. Mohamed Ahmed Shalaby, Assiut University
3. Prof. Mohamed Rafik El Halaby, Ain Shams University
4. Prof. Ahmed Aly Morsy, Cairo University
5. Prof. Hassan Abo Elenein, Mansoura University
6. Prof. Hisham Hammouda, Assiut University
7. Prof. AbdelNasser El Gamasy, Tanta University
8. Prof. Ahmed El Baz, Tudor Bilhartz Institute
9. Prof. Hamada Nassar, Damanhour Institute
10. Prof. Mohamed Wageih, Kobry El kobba Military Hospital

Guidelines Development Group of urological infection committee

1) Prof. Mostafa Khalil, professor of urology (Benha University) (Chair)
2) Prof. Tarek R Eleithy, professor of urology (Theodor Bilharz Research institute) Prof. Shabieb Ahmed, professor of urology (Benha University)
3) Prof. Rabea Gomaa, professor of urology (Benha University)
4) Ass,Prof. Hossam Elawady, assistant professor of urology (Ain shams university) Ass,Prof. Hussein Shaher, assistant professor of urology (Benha University)
5) Ass.Prof. Mohamed Abuelnaga, assistant professor of urology (Ain shams university) Ass,Prof. Amany Kasem. assistant professor of microbiology (Benha University)
6) Dr. Kareem Nouh, lecturer of urology (Benha University)

2 - Funding

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3- Glossary

1. **Antibiotic prophylaxis**: It is treatment with antimicrobial agent(s) before or shortly after (for limited time) certain surgical procedure to prevent local surgical site infection or systemic postprocedural infection
2. **Complicated UTI :** An infection associated with factors that increase the chance of acquiring bacteria and decrease the efficacy of therapy like obstruction and stones
3. **Recurrent UTI**: Recurrences of uncomplicated and/or complicated UTIs, with a frequency of at least three UTIs/year or two UTIs in the last six months
4. **UTI:** An inflammatory response of the urothelium to bacterial invasion that is usually associated with bacteriuria and pyuria.
5. **Uncomplicated UTI**: An infection in a healthy patient with a structurally and functionally normal urinary tract.
6. **Urosepsis:** Sever form of UTI with a considerable mortality rate

4 - List of Abbreviations

ABP	Acute prostatitis
ABU	Asymptomatic bacteriuria
AFP	Acid fast bacilli
AUA	American urological association
AUC	Acute Uncomplicated Cystitis
BPS	Best Practice statement
CAA	Circulating anodic antigen
CA-uti	Catheter associated urinary tract infection
CBP	Chronic bacterial prostatitis
CDC	The Centers for Disease Control and Prevention
CFU	Colony forming unit
CLED	Cysteine-lactose- electrolyte- deficient media
CMV	Cytomegalovirus
CPPS	Chronic pelvic pain syndrome
CT	Computed tomography
cUTI	Complicated urinary tract infections
EAU	European association of urology
ESBL	extended spectrum beta lactamase
EQUC	Expanded quantitative urine culture
FAST-ELISA	Falcon assay screening test – enzyme linked immunosorbent assay
GCS	Glasgow coma scale
HPF	high power field
LUTS	Lower urinary tract symptoms
MDR	Multiple drug resistance
MRSA	Methicillin Resistant Staph Aureus
NAAT	nucleic acid amplification tests
NG	Neisseria gonorrhoeae
NGS	next-generation sequencing
NICE	National institute for health and care excellence
NIDDK	National Institute of Diabetes, Digestive and Kidney Diseases
NIH	National Institutes of Health
PCR	Polymerase chain reaction
PMNL	polymorphonuclear leukocytes
PZQ	Praziquentel
SOFA	Sequential [Sepsis-related] Organ Failure Assessment
SWL	Shock wave lithotripsy
rUTI	Recurrent urinary tract infections
TMP-SMX	Trimethoprim- sulfamethoxazole
TRUS	Trans rectal ultrasound
TURP	Transurethral resection of prostate
UTI	Urinary tract infection
WGS	Whole-genome sequencing
WHO	World health organization
XGP	Xanthogranulomatous pyelonephritis

4 - Executive Summary

These guidelines provide essential summarized updated information for diagnosis, treatment and prevention of urinary tract Infections with emphasizing on judicious use of antimicrobials based on culture and sensitivity to reduce bacterial resistance which is a serious issue especially with malpractice and misuse of antibiotics in Egypt. Moreover, the recommendations included in these guidelines are not representing absolute mandates but provisional protocols respecting environmental and socioeconomic conditions of Egypt, considering our religious and traditional background

1. Diagnosis of ABU is made by urine culture, either properly collected clean-catch specimen or a catheterized specimen is acceptable. (**Strong)**
2. Do not to treat ABU in the following condition. (**Strong)**
    - Women without risk factors.
    - Patients with regulated diabetes mellitus.
    - Post-menopausal women.
    - Elderly institutionalized patients.
    - Patients with spinal cord injury, dysfunctional and/or reconstructed lower urinary tracts, and indwelling catheter
    - Patients with renal transplant. Patients with arthroplasty surgeries.
    - Patients with recurrent urinary tract infections.
3. Treat ABU prior urologic procedure breaching the mucosa and in pregnancy. (**Strong)**
4. Diagnosis of uncomplicated cystitis in women who have no risk factors for complicated urinary tract infections by a focused history of lower urinary tract symptoms. (**Strong)**
5. Uses of urine cultures in the following situations: (**Strong)**
    a. suspected acute pyelonephritis.
    b. symptoms that do not resolve or recur within four weeks after the completion of treatment.
    c. women who present with atypical symptoms. Pregnant women.
6. Women with uncomplicated cystitis should be treated by antimicrobial therapy with or without symptomatic treatment. (**Strong)**

Recommendations for Recurrent UTIs

7. Diagnosis of each UTI episode clinically and is supported by symptoms of dysuria, frequency, urgency, hematuria, back pain, costovertebral tenderness and the absence of vaginal discharge or irritation. (**Strong)**

8. Complicated cases of UTI may also be ruled out on history and physical examination. Uroflowmetry and determining post void residual are suggested tests in postmenopausal women to exclude complicated cases of UTI. (**Conditional**)
9. Culture and sensitivity analysis when symptomatic and in 2 weeks from sensitivity-adjusted treatment to confirm UTI guide further treatment and exclude persistence. (**Strong)**
10. Further investigations e.g. (pelviabdominal US, PUT, CT abdomen and pelvis with or without contrast or cystoscopy) are not routinely recommended except in atypical cases. **(Strong)**
11. management and follow-up

    Behavioral modifications are suggested e.g. reduced fluid intake, habitual and post-coital delayed urination, wiping from front to back after defecation, douching and wearing occlusive underwear. **(good practice statement)**
12. Non antimicrobial measures: Hormonal replacement: Use vaginal estrogen cream in post- menopausal women to prevent recurrent UTIs. **(good practice statement)**
13. Immunoactive prophylaxis: Use OM-89(Uro-vaxom) as an immunoprophylaxis in females with recurrent UTIs. **(Strong)**
14. Prophylaxis with cranberry: Do not use cranberry as a prophylaxis against recurrent UTIs. **(Conditional)**

Recommendations for uncomplicated pyelonephritis

15. Detailed history taking and urinalysis including the assessment of white and red blood cells and nitrite, for routine diagnosis. **(Strong)**
16. perform urine culture and antimicrobial susceptibility testing in patients with pyelonephritis. **(Strong)**
17. Imaging of the urinary tract (US) to exclude urgent urological disorders.Strong
18. treat patients who will be managed as outpatients by single-drug oral therapy with a fluoroquinolone or cephalosporines. **(Strong)**
19. Patients requiring hospitalization should be treated initially with an intravenous antimicrobial regimen e.g. a fluoroquinolone, an aminoglycoside (with or without ampicillin), or an extended- spectrum cephalosporin. **(Strong)**
20. Carbapenem is used only in patients with early culture results indicating the presence of multi-drug resistance organisms. **(Strong)**

Recommendations for complicated UTI

21. Urinalysis is recommended including the assessment of white and red blood cells and nitrite, for routine diagnosis. **(Strong)**
22. Performing urine culture and antimicrobial susceptibility testing is also recommended in patients with complicated UTI. **(Strong)**
23. Imaging of the urinary tract with US to exclude urgent urological disorders is

recommended. Additional investigations, such as an unenhanced helical computed tomography (CT) is recommended if the patient remains febrile after 72 hours of treatment. **(Strong)**

24. For diagnosis of complicating factors in pregnant women, US, or magnetic resonance imaging (MRI) is recommended to avoid radiation risk to the foetus. **(Strong)**
25. It is recommended to properly manage the urological abnormality or the underlying complicating factor. **(Strong)**
26. **Renal abscess:** IT can rupture into the urinary tract or penetrate through the renal capsule to become a perinephric abscess. Use of IV combined antibiotics and careful observation of a small abscess less than 3 cm or even 5 cm in a clinically stable patient. Percutaneous drainage if greater than 5 cm in diameter or open surgical drainage if percutaneous drainage failed. **(Strong)**
27. **Perinephric abscess:** Broad spectrum antimicrobial agents are to be started immediately upon diagnosis of perinephric abscess. For larger collections or those not responsive to initial antibiotic therapy, intervention by percutaneous drainage techniques, by US or CT is recommended. Surgical drainage, or nephrectomy if the kidney is nonfunctioning or severely infected. **(Strong)**
28. **Emphysematous pyelonephritis:** Most patients are septic, and fluid resuscitation and broad-spectrum antimicrobial therapy is nedded . If the kidney is functioning, medical therapy can be considered. If a kidney is obstructed, catheter drainage is considered. If the affected kidney is nonfunctioning and not obstructed, nephrectomy should be performed because medical treatment alone is usually lethal. Nephrectomy is recommended for patients who do not improve after a few days of therapy. **(Strong)**
29. **Xanthogranulomatous pyelonephritis (XGP):** This is characterized by a chronic purulent, fatty inflammation of the renal parenchyma, the pelvis, and the hilar tissue. The primary obstacle to the correct treatment ofXGP is incorrect diagnosis. broad-spectrum antimicrobial therapy is recommended to stabilize the patient preoperatively, and, occasionally, long-term antimicrobial therapy will eradicate the infection and restore renal function. Because the renal abnormality may be diagnosed preoperatively as a renal tumor and/ or is diffuse, nephrectomy is usually performed. If localized XGP is diagnosed preoperatively or at exploration, it is amenable to partial nephrectomy. **(Strong)**

Recommendations for catheter-associated UTI

30. Routine urinary culture only in symptomatic patients, take the sample from the catheter using an aseptic technique, if the catheter has been removed obtain a midstream urine sample. **(Strong)**
31. Don’t use pyuria as indicator for catheter associated UTI, the longer the catheter in place, the most likely bacteria will be found. After one month nearly all patients have bacteriuria. **(Strong)**
32. Don’t use the presence or absence of odorous or cloudy urine alone to differentiate

CA-UTI from CA- asymptomatic bacteriuria. **(Strong)**

33. Give oral antibiotics as a first line if the person can take oral medications, and the severity of their condition does not require intravenous antibiotics. **(Strong)**
34. Choice of intravenous antibiotics (if vomiting, unable to take oral antibiotics or severely unwell). Antibiotics may be combined if susceptibility of sepsis is a concern. **(Strong)**
35. Don't treat CA-UTI asymptomatic bacteriuria in general except prior to traumatic urinary tract intervention and pregnant woman as of increased risk of pyelonephritis and preterm labor. **(Strong)**

Recommendations for urosepsis

36. Perform the quick SOFA score to identify patients with potential sepsis. **(Strong)**
37. Take a urine culture and two sets of blood cultures before starting antimicrobial treatment. **(Strong)**
38. We suggest Using biomarkers for diagnosis; however, urosepsis cannot be diagnosed from biomarkers alone. Procalcitonin monitoring may be useful in patients likely to develop sepsis and to differentiate from a severe inflammatory status not due to bacterial infection, Serum lactate is a marker of organ dysfunction and is associated with mortality in sepsis. **(Conditional)**
39. urosepsis treatment requires a combination of appropriate antimicrobial therapy, source control (obstruction of the urinary tract) and adequate life-support care. **(Strong)**
40. urologists collaborate with intensive care and infectious disease specialists for the best management of the patient is suggested. **(good practice statement)**

Recommendations for urethritis

41. Detailed history taking and urine analysis (first voided urine) and leukocyte esterase testing is diagnostic of urethritis. **(Strong)**
42. We suggest Gram or methylene-blue stain of urethral secretions, to diagnose gonococcal urethritis. **(Conditional)**
43. It is strongly recommended to instruct Patients to abstain from sexual intercourse for seven days after therapy. **(Strong)**
44. **Gonococcal urethritis** : Nucleic acid amplification tests are suggested (NAAT) especially in cases of urethritis with negative Gram stain test as it is more sensitive and specific in diagnosis of chlamydial and gonococcal infections.Urethral swab culture is suggested before initiation of treatment, in patients with a positive NAAT for gonorrhea to assess the antimicrobial resistance profile of the infective strain. **(Conditional)**
45. Urethral swab culture for N. gonorrhoeae and C. trachomatis is suggested in treatment failure or persistence of symptoms more than 4 weeks of treatment. **(Conditional)**
46. It is recommended to assess all sexual partners at risk. Empirical treatment is

strongly recommended following diagnosis especially in severe cases.Combination treatment using two antimicrobials with different mechanisms of action is strongly recommended.It is strongly recommended to start with Ceftriaxone 1 g intramuscularly or intravenously with azithromycin 1 g single oral dose as first line treatment. (**Strong)**

47. Non-gonococcal urethritis: Oral doxycycline 100 mg twice daily for seven days as first-line treatment is strongly recommended. **(Strong)**
48. It is also suggested, single dose oral azithromycin 500 mg day one and 250 mg days two to four. Fluoroquinolones, such as ofloxacin or levofloxacin is considered as second-line treatment only in selected cases. **(Conditional)**
49. Oral metronidazole or tinidazole 2 g single dose as first-line treatment for urethritis caused by T. vaginalis. **(Strong)**

Recommendations for Acute Bacterial Prostatitis

50. Detailed history taking and mid-stream urine analysis, testing for nitrite and leukocytes is strongly recommended. **(Strong)**
51. Mid-stream urine culture and sensitivity for proper antimicrobial treatment is suggested and Transrectal ultrasound is considered if prostatic abscess is highly suggested. **(Conditional)**
52. Empirical high doses bactericidal antimicrobials, such as broad- spectrum penicillin, a third-generation cephalosporin or fluoroquinolones are recommended.It is recommended to continue oral treatment after improvement of general condition for two to four weeks.In case of prostatic abscess, both surgical drainage or conservative treatment according to abscess size and general condition is recommended. **(Strong)**

Recommendations for Chronic Bacterial Prostatitis CBP

53. Detailed history taking including (sexual activities, marital status and age of marriage) is recommended. **(Strong)**
54. The Meares and Stamey 2- or 4-glass test is strongly recommended in patients with CBP. **(Strong)**
55. Prostatic biopsy is not recommended to avoid sepsis. **(Strong)**
56. Transrectal ultrasound is suggested in selected cases to rule out chronic prostatic abscess and prostatic calcification. **(good practice statement)**
57. Semen culture is suggested as a part of evaluation of chronic bacterial prostatitis. **(good practice statement)**
58. PSA testing is not recommended for patients with CBP as it has no clinical or practical significance. **(Strong)**
59. Fluoroquinolone is strongly recommended as a first-line treatment for 4-6 weeks Doxycycline is recommended for Mycoplasma infection 100 mg BID for 10 days. **(Strong)**

60. Metronidazole is suggested in patients with Trichomonas vaginalis for 14 days. **(conditional)**

Recommendations for acute infective epididymitis

61. Obtain detailed history, symptoms analysis and also obtain first voided urine and a mid-stream urine for pathogen identification by culture and nucleic acid amplification test. **(Strong)**
62. Prescribe a single antibiotic or a combination of two antibiotics active against Chlamydia trachomatis and Enterobacteriaceae in young sexually active men. in older men without sexual risk factors only Enterobacteriaceae should be considered. **(Strong)**
63. Give single dose ceftriaxone 500 mg intramuscularly in addition to a course of an antibiotic active against Chlamydia trachomatis if gonorrheal infection is suspected. **(Strong)**

Recommendations for Fournier's gangrene

64. Start treatment for Fournier's gangrene with broad-spectrum antibiotics on presentation, with subsequent refinements according to culture and clinical response. **(Strong)**
65. Commence repeated surgical debridement for Fournier's gangrene within 24 hours of presentation. **(Strong)**
66. We consider performing primary or secondary wound closure for scrotal defects ≤ 50%, with the use of flaps or skin grafts for defects involving > 50% of the scrotum or with extension outside the scrotum. **(good practice statement)**

Recommendations for antimicrobial prophylaxis in different urologic procedures

67. We consider it before urodynamic study and cystography. **(Conditional)**
68. We consider it before urethral catheterization and removal. **(good practice statement)**
69. We consider it before Shock-Wave Lithotripsy. **(Conditional)**
70. We consider it before Simple Cystoscopy. **(Conditional)**
71. We recommend it before TRUS guided prostatic biopsy, Transurethral Resection of the Prostate and bladder tumors, ureteroscopy, percutaneous renal Surgery and open or laparoscopic surgery. **(Strong)**

Recommendations for urinary Schistosomiasis

72. Urine analysis for diagnosis should be collected between 9 AM and 3 PM. to assess the egg count. **(Strong)**
73. Serologic tests: **(Strong)**
    - It is strongly recommended when the diagnosis of urinary schistosomiasis is suspected, and urine is negative for eggs

- FAST-ELISA followed by Western blot analysis.
- Patients become antibody positive after 4-6 months from infection PCR for antigen detection:Detection of circulating anodic antigen in serum and urine are specific for active infection and quantitative measurements useful for determining infection severity

74. Praziquantel is the recommended oral treatment now,It is currently recommended by the WHO Dose: Two 20-mg/kg oral doses of PZQ are given on the same day, 6 to 8 hours apart (or alternatively, one 40-mg/kg dose) The drug has lower effect against schistosomula than adult worms, so another course should be repeated after several weeks to ensure eradication of infection. **(Strong)**
75. Cystoscopy is highly recommended if LUTS is persisting after adequate medical treatment or radiological findings of bladder lesions. **(Strong)**

i - Introduction, purpose, scope, and target audience

Introduction:

These guidelines provide essential summarized updated information for diagnosis, treatment and prevention of urinary tract Infections with emphasizing on judicious use of antimicrobials based on culture and sensitivity to reduce bacterial resistance which is a serious issue especially with malpractice and misuse of antibiotics in Egypt. Moreover, the recommendations included in these guidelines are not representing absolute mandates but provisional protocols respecting environmental and socioeconomic conditions of Egypt, considering our religious and traditional background.

Purpose and scope :

These guidelines are crucial for ensuring consistent and evidence-based care, particularly in a field where practices can vary significantly. By aligning local practices with global standards, they not only enhance patient outcomes but also empower healthcare providers with the knowledge to tackle the challenges presented by urological infections effectively. Furthermore, incorporating local expertise ensures that the guidelines are relevant and practical, ultimately fostering a more effective healthcare system in Egypt**.**

The Urologic Egyptian Guidelines on Urological Infections aim to support clinical practitioners and urologists in comprehensively understanding the incidence, standardized definitions, diagnosis, treatment, and follow-up of urological infections. This document integrates the latest international guidelines with insights from local experts, taking into account the unique healthcare and socioeconomic landscape of Egypt. It also includes perspectives from specialists in urological infections, serving as a thorough and authoritative reference for all clinicians as of the publication date.

Target audience:

The urinary tract infection infection guidelines are mainly intended for practicing urologists , health care providers, nurses, and hygiene control personnel to aid in patient care. They can also benefit health authorities and healthcare institutions by improving their understanding and support of UTI management. Moreover, these guidelines are useful for urologists in training, offering evidence-based insights and clinical recommendations for the treatment of urological infection.

ii - *Methods*

A comprehensive search for guidelines was undertaken to identify the most relevant guidelines to consider for adaptation.

Inclusion/exclusion criteria followed in the search and retrieval of guidelines to be adapted:

- Selecting only evidence-based guidelines (guideline must include a report on systematic literature searches and explicit links between individual recommendations and their supporting evidence)
- Selecting only national and/or international guidelines
- Specific range of dates for publication (using Guidelines published or updated 2015 and later)
- Selecting peer reviewed publications only
- Selecting guidelines written in English language
- Excluding guidelines written by a single author not on behalf of an organization in order to be valid and comprehensive, a guideline ideally requires multidisciplinary input
- Excluding guidelines published without references as the panel needs to know whether a thorough literature review was conducted and whether current evidence was used in the preparation of the recommendations

The following characteristics of the retrieved guidelines were summarized in a table:

- Developing organisation/authors
- Date of publication, posting, and release
- Country/language of publication
- Date of posting and/or release
- Dates of the search used by the source guideline developers

All retrieved Guidelines were screened and appraised using AGREE II instrument (www.agreetrust.org) by at least two members. the panel decided a cut-off point or rank the guidelines (any guideline scoring above 50% on the rigour dimension was retained).

Databases searched included Cochrane Libraries and European Association of Urology (EAU) guidelines, in the period from January 2022and September 2025. (24)

Adaptation of the Egyptian cultural aspects, the level of urologists' capabilities and the availability of well equipped hospitals were considered in the methodology of diagnosis and different treatment modalities.

Evidence assessment.

According to WHO handbook for Guidelines we used the GRADE (Grading of Recommendations, Assessment, Development and Evaluation) approach to assess the quality of a body of evidence, develop and report recommendations (18, 19). GRADE methods are used by WHO because these represent internationally agreed standards for making transparent recommendations. Detailed information on GRADE is available on the following sites:

- GRADE working group: http://www.gradeworkingroup.org
- GRADE online training modules: http://cebgrade.mcmaster.ca/
- GRADE profile software: http://ims.cochrane.org/revman/gradepro

Table 1 Quality of evidence in GRADE

Quality level	Definition
High	We are very confident that the true effect lies close to that of the estimate of the effect.
Moderate	We are moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
Low	Our confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the effect.
Very low	We have very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of effect.

GRADE: Grading of Recommendations Assessment, Development and Evaluation.

Table 2 Significance of the four levels of evidence

Quality	Definition	Implications
High	The guideline development group is very confident that the true effect lies close to that of the estimate of the effect	Further research is very unlikely to change confidence in the estimate of effect
Moderate	The guideline development group is moderately confident in the effect estimate: the true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate
Low	Confidence in the effect estimate is limited: the true effect may be substantially different from the estimate of the true effect	Further research is very likely to have an important impact on confidence in the estimate of effect and is unlikely to change the estimate
Very low	The group has very little confidence in the effect estimate: the true effect is likely to be substantially different from the estimate of the effect	Any estimate of effect is very uncertain

Table 3: Factors that determine How to upgrade or downgrade the quality of evidence

Downgrade in presence of	Upgrade in presence of
Study limitations -1 Serious limitations -2 Very serious limitations	Dose-response gradient +1 Evidence of a dose-response gradient
Consistency -1 Important inconsistency	Direction of plausible bias +1 All plausible confounders would have reduced the effect
Directness -1 Some uncertainty -2 Major uncertainty	Magnitude of the effect +1 Strong, no plausible confounders, consistent and direct evidence
Precision -1 Imprecise data	+2 Very strong, no major threats to validity and direct evidence
Reporting bias -1 High probability of reporting bias	

The strength of the recommendation.

The strength of a recommendation communicates the importance of adherence to the recommendation.

Strong recommendations.

With strong recommendations, the guideline communicates the message that the desirable effects of adherence to the recommendation outweigh the undesirable effects. This means that in most situations the recommendation can be adopted as policy.

Conditional recommendations.

These are made when there is greater uncertainty about the four factors above or if local adaptation has to account for a greater variety in values and preferences, or when resource use makes the intervention suitable for some, but not for other locations. This means that there is a need for substantial debate and involvement of stakeholders before this recommendation can be adopted as policy.

When not to make recommendations.

When there is lack of evidence on the effectiveness of an intervention, it may be appropriate not to make a recommendation.

iii - Recommendations (level of evidence and strength of recommendation)

Table 4: Recommendations for asymptomatic bacteriuria (ABU)

Recommendations	**GRADE Level of certainty**	**Strength Rating**
Diagnosis of ABU is made by urine culture, either properly collected clean-catch specimen or a catheterized specimen is acceptable.	High (3,4)	Strong
Do not to treat ABU in the following condition. Women without risk factors. Patients with regulated diabetes mellitus. Post-menopausal women. Elderly institutionalized patients. Patients with spinal cord injury, dysfunctional and/or reconstructed lower urinary tracts, and indwelling catheter Patients with renal transplant. Patients with arthroplasty surgeries. Patients with recurrent urinary tract infections.	High (5,6)	Strong
Treat ABU prior urologic procedure breaching the mucosa and in pregnancy.	High (5,6)	Strong

Table 5: Recommendations for acute uncomplicated cystitis (AUC)

Recommendations	**GRADE Level of certainty**	**Strength Rating**
Diagnosis of uncomplicated cystitis in women who have no risk factors for complicated urinary tract infections by a focused history of lower urinary tract symptoms	High (7)	Strong
Uses of urine cultures in the following situations: suspected acute pyelonephritis. symptoms that do not resolve or recur within four weeks after the completion of treatment. women who present with atypical symptoms. Pregnant women.	High (7,8)	Strong
Women with uncomplicated cystitis should be treated by antimicrobial therapy with or without symptomatic treatment	High (9)	Strong

Table 6: Recommendations for Recurrent UTIs

Recommendations	GRADE Level of certainty	Strength Rating
Diagnosis of each UTI episode clinically and is supported by symptoms of dysuria, frequency, urgency, hematuria, back pain, costovertebral tenderness and the absence of vaginal discharge or irritation.	High (8,9)	Strong
Complicated cases of UTI may also be ruled out on history and physical examination. Uroflowmetry and determining post void residual are suggested tests in postmenopausal women to exclude complicated cases of UTI	Low (8,9)	Conditional
Culture and sensitivity analysis when symptomatic and in 2 weeks from sensitivity-adjusted treatment to confirm UTI guide further treatment and exclude persistence.	High (8,9)	Strong
Further investigations e.g. (pelviabdominal US, PUT, CT abdomen and pelvis with or without contrast or cystoscopy) are not routinely recommended except in atypical cases	High (8,9)	Strong
management and follow-up Behavioral modifications are suggested e.g. reduced fluid intake, habitual and post-coital delayed urination, wiping from front to back after defecation, douching and wearing occlusive underwear.	Low (8,9)	good practice statement
Non antimicrobial measures: Hormonal replacement: Use vaginal estrogen cream in post-menopausal women to prevent recurrent UTIs	Low (8,9)	good practice statement
Immunoactive prophylaxis: Use OM-89(Uro-vaxom) as an immunoprophylaxis in females with recurrent UTIs.	High (8,9)	Strong
Prophylaxis with cranberry: Do not use cranberry as a prophylaxis against recurrent UTIs.	Moderate (8,9)	Conditional

Table 7: Recommendations for uncomplicated pyelonephritis

Recommendations	GRADE Level of certainty	Strength Rating
Detailed history taking and urinalysis including the assessment of white and red blood cells and nitrite, for routine diagnosis.	High (10-12)	Strong
perform urine culture and antimicrobial susceptibility testing in patients with pyelonephritis.	High (10-12)	Strong
Imaging of the urinary tract (US) to exclude urgent urological disorders.	High (10-12)	Strong
treat patients who will be managed as outpatients by single-drug oral therapy with a fluoroquinolone or cephalosporines.	High (10-12)	Strong
Patients requiring hospitalization should be treated initially with an intravenous antimicrobial regimen e.g. a fluoroquinolone, an aminoglycoside (with or without ampicillin), or an extended-spectrum cephalosporin.	High (10-12)	Strong
Carbapenem is used only in patients with early culture results indicating the presence of multi-drug resistance organisms.	High (10-12)	Strong

Table 8: Recommendations for complicated UTI

Recommendations	GRADE Level of certainty	Strength Rating
Urinalysis is recommended including the assessment of white and red blood cells and nitrite, for routine diagnosis	High (10)	Strong
Performing urine culture and antimicrobial susceptibility testing is also recommended in patients with complicated UTI	High (10,11)	Strong
Imaging of the urinary tract with US to exclude urgent urological disorders is recommended. Additional investigations, such as an unenhanced helical computed tomography (CT) is recommended if the patient remains febrile after 72 hours of treatment.	High (10-12)	Strong
For diagnosis of complicating factors in pregnant women, US, or magnetic resonance imaging (MRI) is recommended to avoid radiation risk to the foetus.	High (10)	Strong
It is recommended to properly manage the urological abnormality or the underlying complicating factor.	High (10)	Strong

Table 9: Recommendations for special types of renal infections

Recommendations	GRADE Level of certainty	Strength Rating
Renal abscess: IT can rupture into the urinary tract or penetrate through the renal capsule to become a perinephric abscess. Use of IV combined antibiotics and careful observation of a small abscess less than 3 cm or even 5 cm in a clinically stable patient. Percutaneous drainage if greater than 5 cm in diameter or open surgical drainage if percutaneous drainage failed.	High (13,14)	Strong
Perinephric abscess: Broad spectrum antimicrobial agents are to be started immediately upon diagnosis of perinephric abscess. For larger collections or those not responsive to initial antibiotic therapy, intervention by percutaneous drainage techniques, by US or CT is recommended . Surgical drainage, or nephrectomy if the kidney is nonfunctioning or severely infected.	High (15)	Strong
Emphysematous pyelonephritis: Most patients are septic, and fluid resuscitation and broad-spectrum antimicrobial therapy is nedded . If the kidney is functioning, medical therapy can be considered. If a kidney is obstructed, catheter drainage is considered. If the affected kidney is nonfunctioning and not obstructed, nephrectomy should be performed because medical treatment alone is usually lethal. Nephrectomy is recommended for patients who do not improve after a few days of therapy.	High (16)	Strong
Xanthogranulomatous pyelonephritis (XGP): This is characterized by a chronic purulent, fatty inflammation of the renal parenchyma, the pelvis, and the hilar tissue. The primary obstacle to the correct treatment ofXGP is incorrect diagnosis. broad-spectrum antimicrobial therapy is recommended to stabilize the patient preoperatively, and, occasionally, long-term antimicrobial therapy will eradicate the infection and restore renal function. Because the renal abnormality may be diagnosed preoperatively as a renal tumor and/ or is diffuse, nephrectomy is usually performed. If localized XGP is diagnosed preoperatively or at exploration, it is amenable to partial nephrectomy	High (17)	Strong

Table 10: Recommendations for catheter-associated UTI

Recommendations	GRADE Level of certainty	Strength Rating
Routine urinary culture only in symptomatic patients, take the sample from the catheter using an aseptic technique, if the catheter has been removed obtain a midstream urine sample.	High (18,19)	Strong
Don't use pyuria as indicator for catheter associated UTI, the longer the catheter in place, the most likely bacteria will be found. After one month nearly all patients have bacteriuria.	High (18,19)	Strong
Don't use the presence or absence of odorous or cloudy urine alone to differentiate CA-UTI from CA- asymptomatic bacteriuria.	High (18,19)	Strong
Give oral antibiotics as a first line if the person can take oral medications, and the severity of their condition does not require intravenous antibiotics.	High (18,19)	Strong
Choice of intravenous antibiotics (if vomiting, unable to take oral antibiotics or severely unwell). Antibiotics may be combined if susceptibility of sepsis is a concern.	High (18,19)	Strong
Don't treat CA-UTI asymptomatic bacteriuria in general except prior to traumatic urinary tract intervention and pregnant woman as of increase risk of pyelonephritis and preterm labor.	High (18,19)	Strong

Table 11: Recommendations for urosepsis

Recommendations	GRADE Level of certainty	Strength Rating
Perform the quick SOFA score to identify patients with potential sepsis.	High (21)	Strong
Take a urine culture and two sets of blood cultures before starting antimicrobial treatment.	High (20,21)	Strong
We suggest Using biomarkers for diagnosis; however, urosepsis cannot be diagnosed from biomarkers alone. Procalcitonin monitoring may be useful in patients likely to develop sepsis and to differentiate from a severe inflammatory status not due to bacterial infection, Serum lactate is a marker of organ dysfunction and is associated with mortality in sepsis.	Moderate (20,21)	Conditional

urosepsis treatment requires a combination of appropriate antimicrobial therapy, source control (obstruction of the urinary tract) and adequate life-support care.	High (22)	Strong
urologists collaborate with intensive care and infectious disease specialists for the best management of the patient is suggested.	Low (22)	good practice statement

Table 12: Recommendations for urethritis

Recommendations	**GRADE Level of certainty**	**Strength Rating**
Detailed history taking and urine analysis (first voided urine) and leukocyte esterase testing is diagnostic of urethritis	High (24)	Strong
We suggest Gram or methylene-blue stain of urethral secretions, to diagnose gonococcal urethritis.	Moderate (24)	Conditional
It is strongly recommended to instruct Patients to abstain from sexual intercourse for seven days after therapy	High (24)	Strong
Gonococcal urethritis Nucleic acid amplification tests are suggested (NAAT) especially in cases of urethritis with negative Gram stain test as it is more sensitive and specific in diagnosis of chlamydial and gonococcal infections. Urethral swab culture is suggested before initiation of treatment, in patients with a positive NAAT for gonorrhea to assess the antimicrobial resistance profile of the infective strain.	Low (24)	Conditional
Urethral swab culture for N. gonorrhoeae and C. trachomatis is suggested in treatment failure or persistence of symptoms more than 4 weeks of treatment.	Moderate (24)	Conditional
It is recommended to assess all sexual partners at risk. Empirical treatment is strongly recommended following diagnosis especially in severe cases. Combination treatment using two antimicrobials with different mechanisms of action is strongly recommended. It is strongly recommended to start with Ceftriaxone 1 g intramuscularly or intravenously with azithromycin 1 g single oral dose as first line treatment	High (24)	Strong

Non-gonococcal urethritis: Oral doxycycline 100 mg twice daily for seven days as first-line treatment is strongly recommended.	High (24)	Strong
It is also suggested, single dose oral azithromycin 500 mg day one and 250 mg days two to four. Fluoroquinolones, such as ofloxacin or levofloxacin is considered as second-line treatment only in selected cases.	Moderate (24)	Conditional
Oral metronidazole or tinidazole 2 g single dose as first-line treatment for urethritis caused by T. vaginalis.	High (24)	Strong

Table 13: Recommendations for Acute Bacterial Prostatitis

Recommendations	**GRADE Level of certainty**	**Strength Rating**
Detailed history taking and mid stream urine analysis, testing for nitrite and leukocytes is strongly recommended.	High (25)	Strong
Mid-stream urine culture and sensitivity for proper antimicrobial treatment is suggested and Transrectal ultrasound is considered if prostatic abscess is highly suggested.	Moderate (26)	Conditional
Empirical high doses bactericidal antimicrobials, such as broad-spectrum penicillin, a third-generation cephalosporin or fluoroquinolones are recommended. It is recommended to continue oral treatment after improvement of general condition for two to four weeks. In case of prostatic abscess, both surgical drainage or conservative treatment according to abscess size and general condition is recommended	High (26,27)	Strong

Table 14 : Recommendations for Chronic Bacterial Prostatitis CBP

Recommendations	GRADE Level of certainty	Strength Rating
Detailed history taking including(sexual activities, marital status and age of marriage) is recommended.	High	Strong
The Meares and Stamey 2- or 4-glass test is strongly recommended in patients with CBP.	High (27,28)	Strong
Prostatic biopsy is not recommended to avoid sepsis.	Moderate (27,28)	Strong
Transrectal ultrasound is suggested in selected cases to rule out chronic prostatic abscess and prostatic calcification.	Low (27,28)	good practice statement
Semen culture is suggested as a part of evaluation of chronic bacterial prostatitis.	Low (28)	good practice statement
PSA testing is not recommended for patients with CBP as it has no clinical or practical significance.	Moderate (28)	Strong
Fluoroquinolone is strongly recommended as a first-line treatment for 4-6 weeks Doxycycline is recommended for Mycoplasma infection 100 mg BID for 10 days	High (28)	Strong
Metronidazole is recommended in patients with Trichomonas vaginalis for 14 days	High (28)	conditional

Table 15: Recommendations for acute infective epididymitis

Recommendations	GRADE Level of certainty	Strength Rating
Obtain detailed history, symptoms analysis and also obtain first voided urine and a mid-stream urine for pathogen identification by culture and nucleic acid amplification test.	High (29)	Strong
Prescribe a single antibiotic or a combination of two antibiotics active against Chlamydia trachomatis and Enterobacteriaceae in young sexually active men. in older men without sexual risk factors only Enterobacteriaceae should be considered.	High (29)	Strong
Give single dose ceftriaxone 500 mg intramuscularly in addition to a course of an antibiotic active against Chlamydia trachomatis if gonorrheal infection is suspected.	High (29)	Strong

Table 16: Recommendations for Fournier's gangrene

Recommendations	GRADE Level of certainty	Strength Rating
Start treatment for Fournier's gangrene with broad-spectrum antibiotics on presentation, with subsequent refinements according to culture and clinical response.	High (30)	Strong
Commence repeated surgical debridement for Fournier's gangrene within 24 hours of presentation.	High (30)	Strong
We consider performing primary or secondary wound closure for scrotal defects ≤ 50%, with the use of flaps or skin grafts for defects involving > 50% of the scrotum or with extension outside the scrotum.	Low (30)	good practice statement

Table 17: Recommendations for antimicrobial prophylaxis in different urologic procedures:

Recommendations	GRADE Level of certainty	Strength Rating
We consider it before urodynamic study and cystography.	Low (35)	Conditional
We consider it before urethral catheterization and removal.	Low(36)	good practice statement
We consider it before Shock-Wave Lithotripsy.	Moderate (37)	Conditional
We consider it before Simple Cystoscopy.	Moderate (10)	Conditional
We recommend it before TRUS guided prostatic biopsy, Transurethral Resection of the Prostate and Bladder tumors, ureteroscopy, percutaneous renal Surgery and open or laparoscopic surgery.	High (39-44)	Strong

Table 18: Recommendations for urinary Schistosomiasis

Recommendations	GRADE Level of certainty	Strength Rating
Urine analysis for diagnosis should be collected between 9 AM and 3 PM. to assess the egg count	High (48)	Strong
Serologic tests: It is strongly recommended when the diagnosis of urinary schistosomiasis is suspected, and urine is negative for eggs FAST-ELISA followed by Western blot analysis. Patients become antibody positive after 4-6 months from infection PCR for antigen detection: Detection of circulating anodic antigen in serum and urine are specific for active infection and quantitative measurements useful for determining infection severity	High (49-50)	Strong
Praziquantel is the recommended oral treatment now,It is currently recommended by the WHO Dose: Two 20-mg/kg oral doses of PZQ are given on the same day, 6 to 8 hours apart (or alternatively, one 40-mg/kg dose) The drug has lower effect against schistosomula than adult worms, so another course should be repeated after several weeks to ensure eradication of infection	High (46-40)	Strong
Cystoscopy is highly recommended if LUTS is persisting after adequate medical treatment or radiological findings of bladder lesions	High (49)	Strong

7 - Clinical indicators of monitoring

1. **Vital signs with accurate measurements of tperature and pulse.**
2. **Urine analysis and urine culture and sensitivity**
3. **Complete blood count**
4. **Kidney function tests**
5. **Ultrasound abdomen and pelvis**

8 - Update of Guideline

This guideline will be updated whenever there is new evidence.

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