# IN THE NAME OF GOD

# ANATOMIC POINT IN RECURRENT U.T.I

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# ANATOMIC POINT IN RECURRENT U.T.I

URINARY TRACT INFECTIONS (UTI) ARE A COMMON AND IMPORTANT CLINICAL PROBLEM IN CHILDHOOD.

# DEFINITION

- INFECTION OF THE URINARY TRACT IS IDENTIFIED BY GROWTH OF A SIGNIFICANT NUMBER OF ORGANISMS OF A SINGLE SPECIES IN THE URINE , IN THE PRESENCE OF SYMPTOMS.
- RECURRENT UTI, DEFINED AS THE RECURRENCE OF SYMPTOMS WITH SIGNIFICANT BACTERIURIA IN PATIENTS WHO HAVE RECOVERED CLINICALLY FOLLOWING TREATMENT, COMMON IN GIRLS

# RISK FACTORS

| | | |
|---|---|---|
| 1- Female gender | 6- Obstructive uropathy | 11- Pinworm infestation |
| 2- Uncircumcised male | 7- Urethral instrumentation | 12- Constipation |
| 3- Vesicoureteral reflux | 8- Wiping from back to front infemales | 13- Bacteria with p fimbriae |
| 4- Toilet training | 9- Bubble bath | 14- Anatomic abnormality ( labial adhesion ) |
| 5- Voiding dysfunction | 10- Tight clothing | 15- Neuropathic bladder |

# SYMPTOMS AND SIGNS

- CLASSIC UTI SYMPTOMS IN OLDER CHILDREN
- DYSURIA, FREQUENCY, URGENCY, SMALL-VOLUME VOIDS, LOWER ABDOMINAL PAIN.
- INFANTS WITH UTIS HAVE NONSPECIFIC SYMPTOMS
- FEVER, IRRITABILITY, VOMITING, POOR APPETITE

# PRESENTING SYMPTOMS AND SIGNS IN INFANTS AND CHILDREN WITH UTI

| **Age group** | | **Symptoms and signs**<br>**Most common ——————————> Least common** | | |
|---|---|---|---|---|
| Infants younger than 3 months | | Fever<br>Vomiting<br>Lethargy<br>Irritability | Poor feeding<br>Failure to thrive | Abdominal pain<br>Jaundice<br>Haematuria<br>Offensive urine |
| Infants and children, 3 months or older | Preverbal | Fever | Abdominal pain<br>Loin tenderness<br>Vomiting<br>Poor feeding | Lethargy<br>Irritability<br>Haematuria<br>Offensive urine<br>Failure to thrive |
| | Verbal | Frequency<br>Dysuria | Dysfunctional voiding<br>Changes to continence<br>Abdominal pain<br>Loin tenderness | Fever<br>Malaise<br>Vomiting<br>Haematuria<br>Offensive urine<br>Cloudy urine |

# EPIDEMIOLOGY

- THE OVERALL PREVALENCE OF UTI IS APPROXIMATELY 5 PERCENT IN FEBRILE INFANTS
- UP TO 7% OF GIRLS AND 2% OF BOYS EXPERIENCE A SYMPTOMATIC CULTURE-PROVEN UTI PRIOR TO 6 YEARS OF AGE.
- OF FEBRILE NEONATES, UP TO 7% HAVE UTIS.
- E. COLI (60-80%), PROTEUS, KLEBSIELLA, ENTEROCOCCUS, AND COAG. NEG. STAPH.

# DIAGNOSIS

- THE DIAGNOSIS OF UTI IS BASED ON POSITIVE CULTURE OF A PROPERLY COLLECTED SPECIMEN OF URINE.

# LEUKOCYTE ESTERASE AND NITRITES

- LE IS PRODUCED FROM THE BREAKDOWN OF LEUKOCYTES.  NOT ALWAYS INDICATIVE OF INFECTION
- VAGINITIS/VULVITIS CAN LEAD TO INFLAMMATION WITHOUT INFECTION ☐ + LE
- NITRITES ARE PRODUCED BY BACTERIA THAT METABOLIZE NITRATES: E. COLI, KLEBSIELLA, PROTEUS (GNRS)
- MUCH MORE PREDICTIVE OF UTI
- GPCS DO NOT PRODUCE NITRITES

# URINE-TESTING STRATEGIES FOR CHILDREN 3 YEARS OR OLDER

| **Dipstick testing for leukocyte esterase and nitrite is diagnostically as useful as microscopy and culture, and can safely be used.** | |
|---|---|
| If both leukocyte esterase and nitrite are positive | The child should be regarded as having UTI and antibiotic treatment should be started. If a child has a high or intermediate risk of serious illness and/or a past history of previous UTI, a urine sample should be sent for culture |
| If leukocyte esterase is negative and nitrite is positive | Antibiotic treatment should be started if the urine test was carried out on a fresh sample of urine. A urine sample should be sent for culture. Subsequent management will depend upon the result of urine culture |
| If leukocyte esterase is positive and nitrite is negative | A urine sample should be sent for microscopy and culture. Antibiotic treatment for UTI should not be started unless there is good clinical evidence of UTI (for example, obvious urinary symptoms). Leukocyte esterase may be indicative of an infection outside the urinary tract which may need to be managed differently |
| If both leukocyte esterase and nitrite are negative | The child should not be regarded as having UTI. Antibiotic treatment for UTI should not be started, and a urine sample should not be sent for culture. Other causes of illness should be explored |

# GUIDANCE ON THE INTERPRETATION OF MICROSCOPY RESULTS

| **Microscopy results** | **Pyuria positive** | **Pyuria negative** |
|---|---|---|
| Bacteriuria positive | The infant or child should be regarded as having UTI | The infant or child should be regarded as having UTI |
| Bacteriuria negative | Antibiotic treatment should be started if clinically UTI | The infant or child should be regarded as not having UTI |

# CLASSIFICATION OF UTI

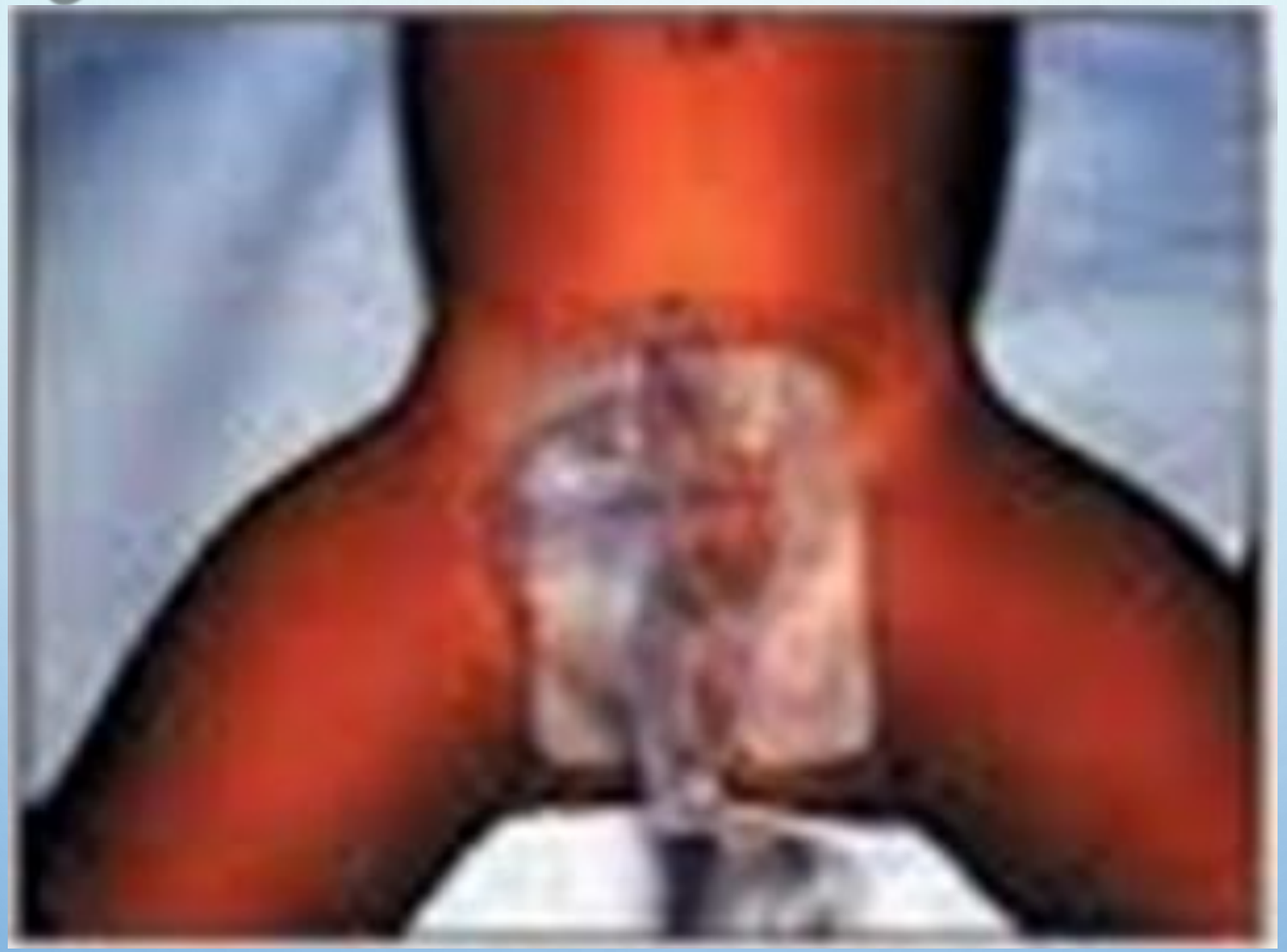
- UPPER URINARY TRACT INFECTIONS (ACUTE PYELONEPHRITIS)

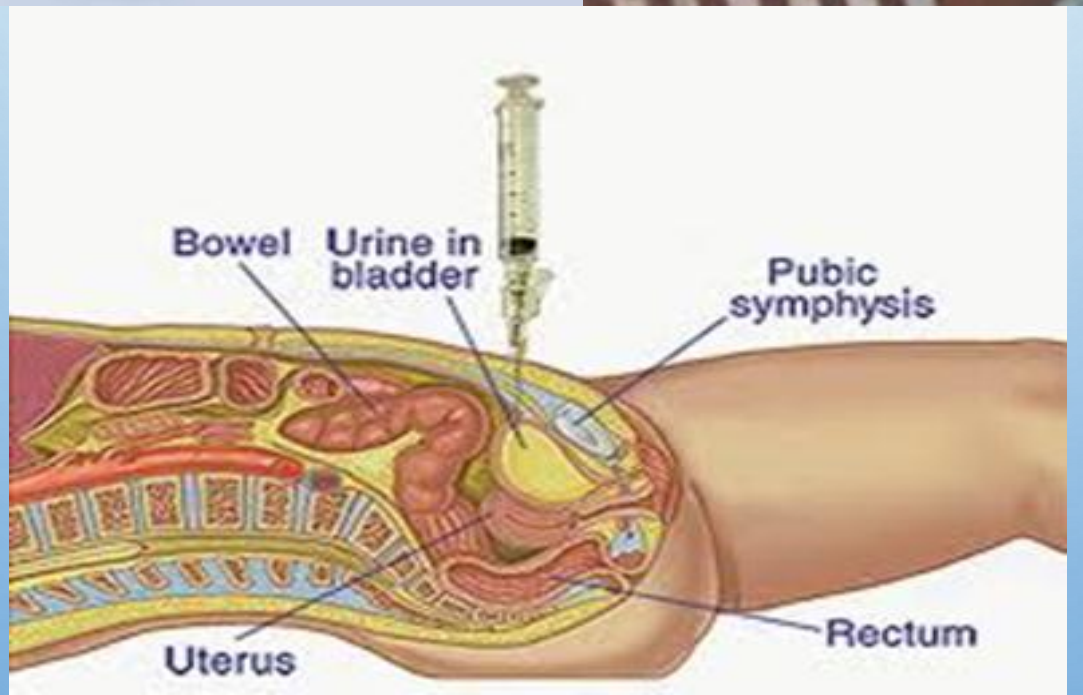
UPPER URINARY TRACT INFECTIONS (ACUTE PYELONEPHRITIS) MAY LEAD TO RENAL SCARRING, HYPERTENSION, AND END-STAGE RENAL DYSFUNCTION.

- LOWER URINARY TRACT INFECTIONS (CYSTITIS)

# URINE COLLECTION

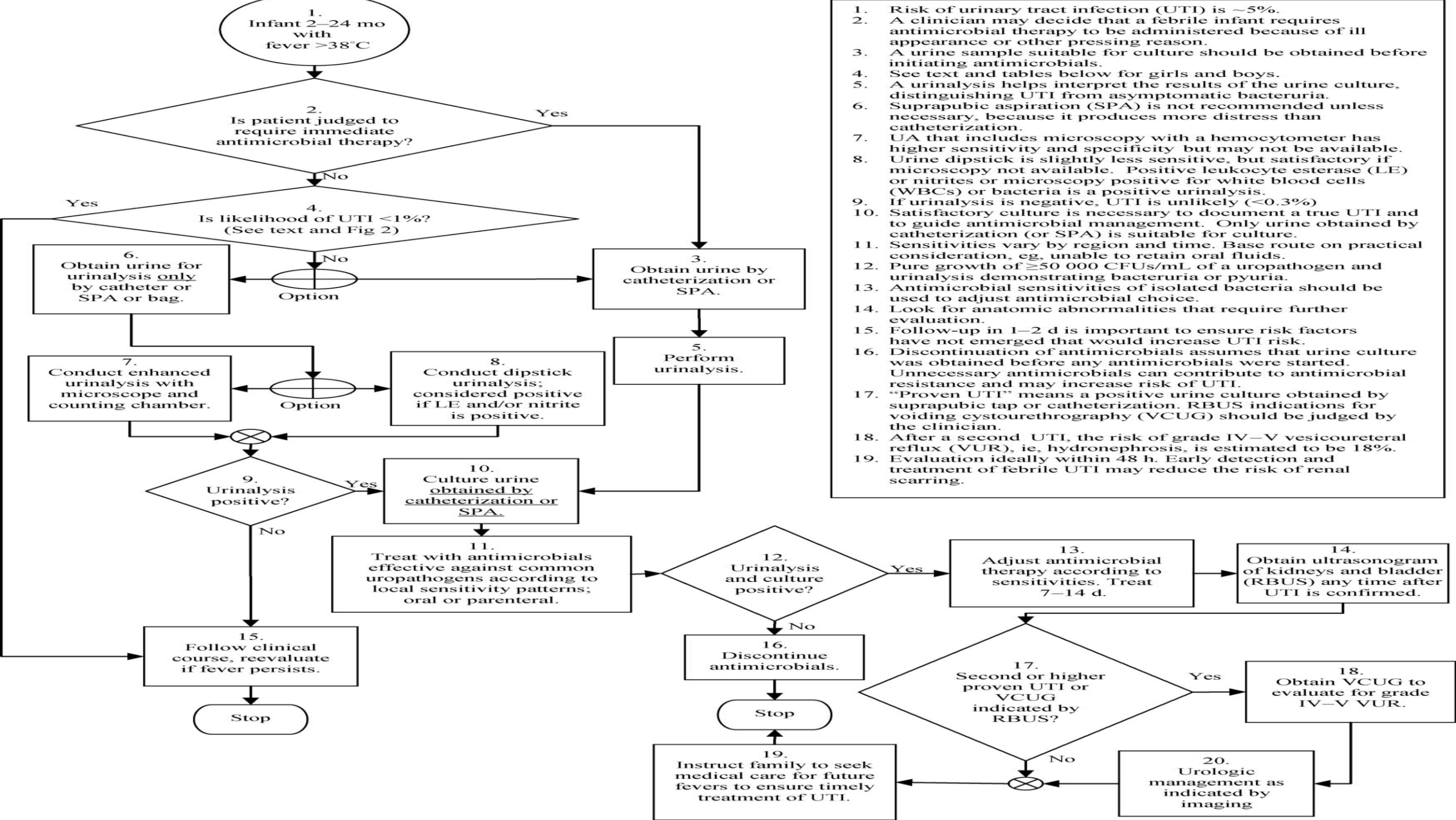
- CLEAN-CATCH
- CATHETER
- SUPRAPUBIC ASPIRATION




Bowel
Urine in bladder
Pubic symphysis
Rectum
Uterus

# DEFINITION OF UTI ON CULTURE

| Method of urine collection | Diagnostic threshold |
|---|---|
| Clean-catch in voiding girls | 100,000 CFU per mL<br>10,000 – 100,000 ☐ repeat culture |
| Clean-catch in voiding boys | 10,000 CFU per mL |
| Catheter | 10,000 CFU<br>1,000 – 10,000 ☐ repeat culture |
| Suprapubic aspiration | Any colonies of GNRs<br>More than a few thousand GPCs |




1. Risk of urinary tract infection (UTI) is ~5%.
2. A clinician may decide that a febrile infant requires antimicrobial therapy to be administered because of ill appearance or other pressing reason.
3. A urine sample suitable for culture should be obtained before initiating antimicrobials.
4. See text and tables below for girls and boys.
5. A urinalysis helps interpret the results of the urine culture, distinguishing UTI from asymptomatic bacteruria.
6. Suprapubic aspiration (SPA) is not recommended unless necessary, because it produces more distress than catheterization.
7. UA that includes microscopy with a hemocytometer has higher sensitivity and specificity but may not be available.
8. Urine dipstick is slightly less sensitive, but satisfactory if microscopy not available. Positive leukocyte esterase (LE) or nitrites or microscopy positive for white blood cells (WBCs) or bacteria is a positive urinalysis.
9. If urinalysis is negative, UTI is unlikely (<0.3%)
10. Satisfactory culture is necessary to document a true UTI and to guide antimicrobial management. Only urine obtained by catheterization (or SPA) is suitable for culture.
11. Sensitivities vary by region and time. Base route on practical consideration, eg, unable to retain oral fluids.
12. Pure growth of ≥50 000 CFUs/mL of a uropathogen and urinalysis demonstrating bacteruria or pyuria.
13. Antimicrobial sensitivities of isolated bacteria should be used to adjust antimicrobial choice.
14. Look for anatomic abnormalities that require further evaluation.
15. Follow-up in 1–2 d is important to ensure risk factors have not emerged that would increase UTI risk.
16. Discontinuation of antimicrobials assumes that urine culture was obtained before any antimicrobials were started. Unnecessary antimicrobials can contribute to antimicrobial resistance and may increase risk of UTI.
17. "Proven UTI" means a positive urine culture obtained by suprapubic tap or catheterization. RBUS indications for voiding cystourethrography (VCUG) should be judged by the clinician.
18. After a second UTI, the risk of grade IV–V vesicoureteral reflux (VUR), ie, hydronephrosis, is estimated to be 18%.
19. Evaluation ideally within 48 h. Early detection and treatment of febrile UTI may reduce the risk of renal scarring.

- THANK YOU FOR ATTENTION