KETTERING Health Network

Urine Culture

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I. PRINCIPLE

Urinary tract infections are one of the most common infections and urine cultures are performed to detect organisms that are the causative agents of urinary tract infections. Normally the urinary tract is sterile above the urethra, however, using noninvasive collection techniques urine is potentially contaminated with normal flora of the urethra and genitourinary tract. For this reason, urine cultures utilize a colony count (quantitation of growth) to aid in determining if organisms present represent contamination/colonization or infection. Infections can be associated with counts of ≥ 50,000 organisms/mL of urine for noninvasively collected urine samples, and with ≥ 10,000 organisms/ mL of urine for invasively collected specimens.

II. SPECIMEN COLLECTION, TRANSPORT, AND HANDLING

A. **Specimens**
   1. For complete guidelines on acceptable specimen types, specimen rejection criteria, and specimen requirements, refer to the Laboratory Collection Manual.

B. **Specimen Transport and Handling**
   1. Unpreserved urine specimens should be setup within 2 hours of collection if kept at room temperature, or if refrigerated, specimens may be held up to 24 hours before processing.
   2. Preserved (boric acid transport tube) urine specimens may be held up to 48 hours at room temperature before processing.

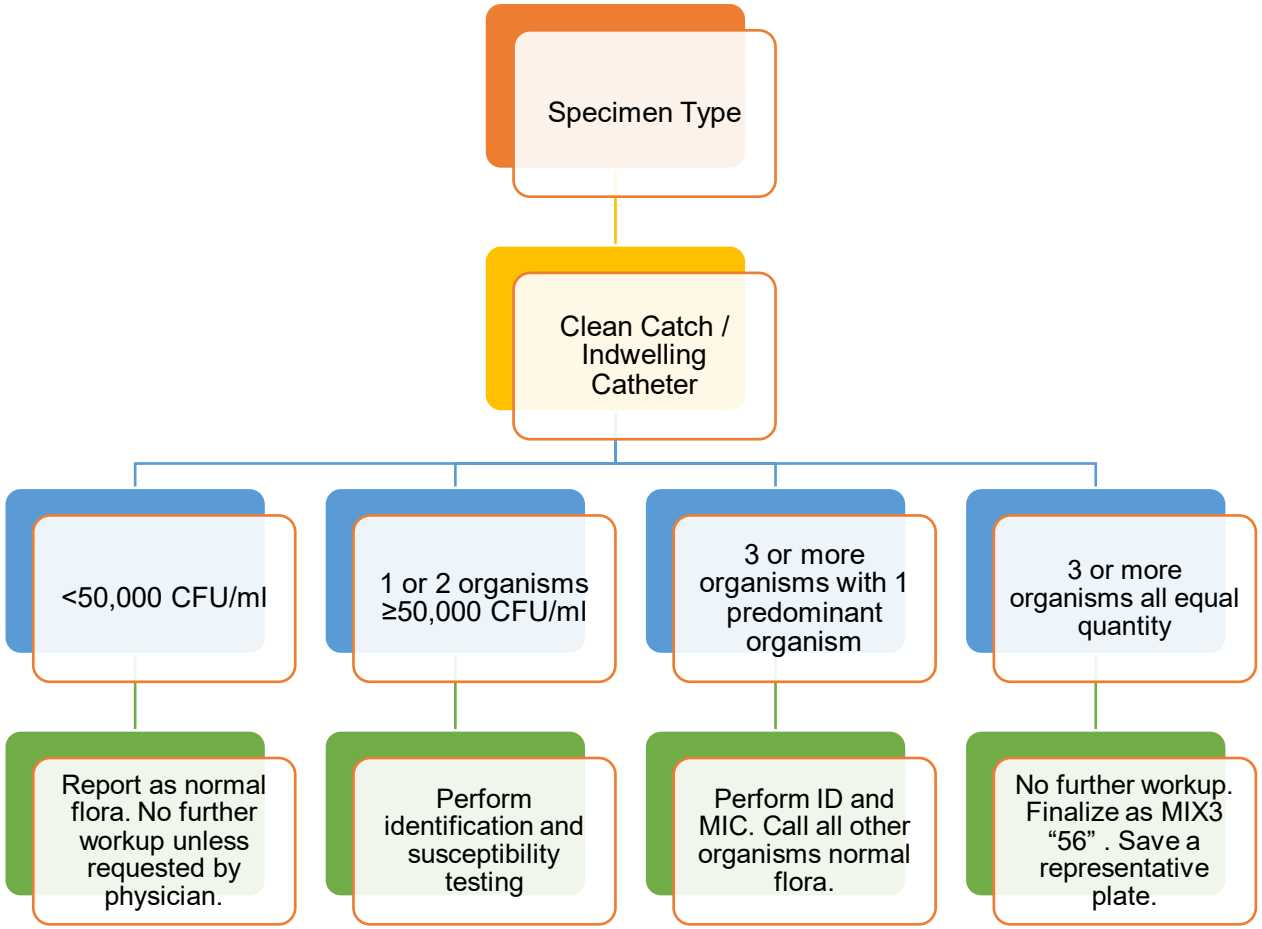
III. PROCEDURE NOTES

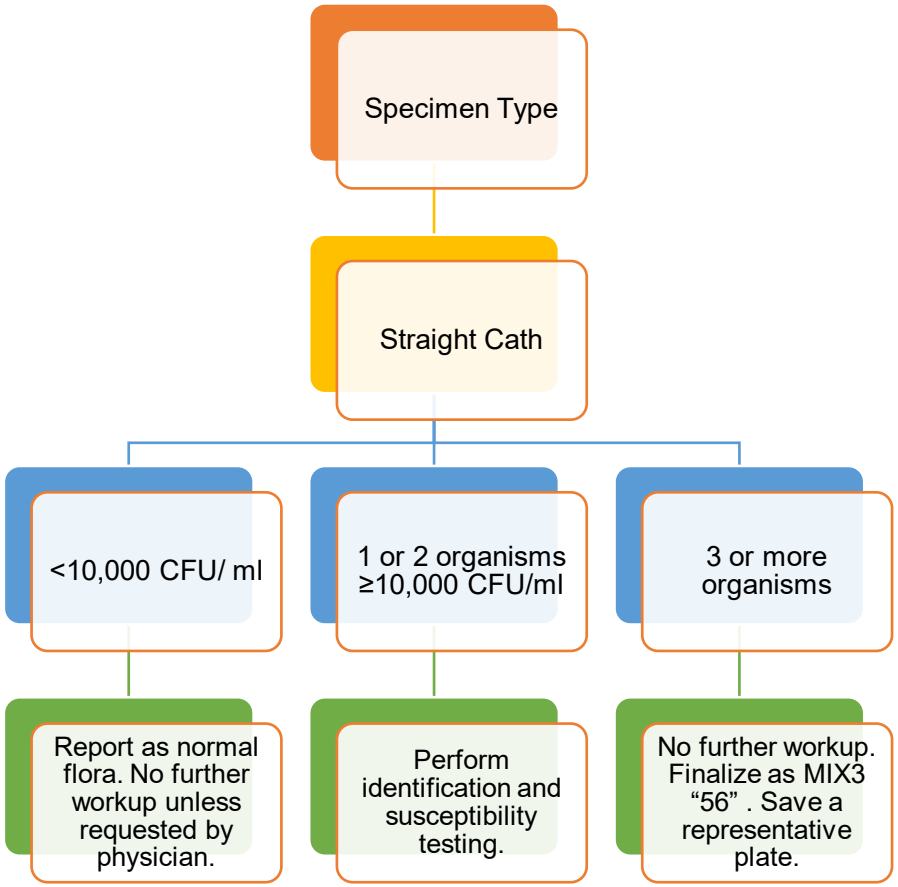
A. Cultures are read during the designated read time periods:

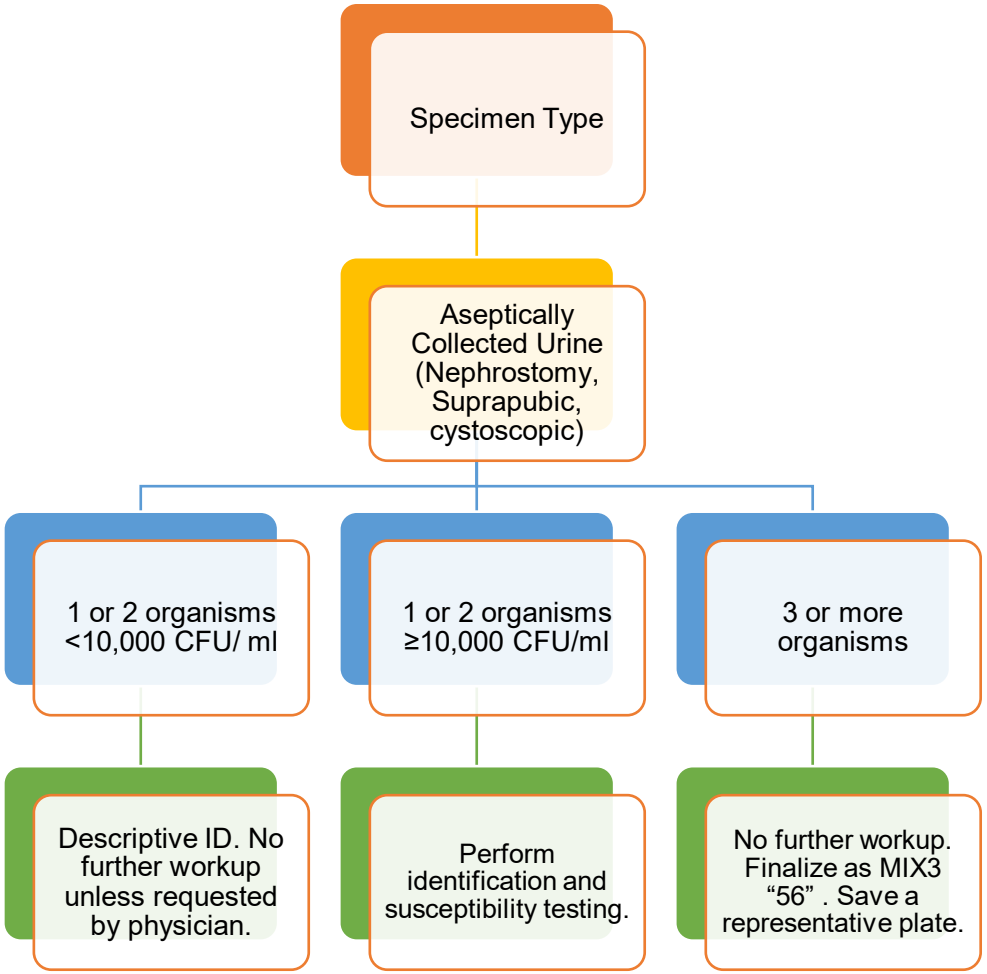
COLOR	TIME PLACED IN INCUBATOR	SCHEDULED READ TIME
ORANGE	**0:00 – 8:59**	**3:00 AM**
PINK	**9:00 – 11:59**	**6:00 AM**
BLUE	**12:00 – 14:59**	**9:00 AM**
PURPLE	**15:00 – 17:59**	**12:00 PM**
GREEN	**18:00 – 20:59**	**3:00 PM**
YELLOW	**21:00 – 23:59**	**6:00 PM**

B. During the read time, plates from the corresponding color should be examined, as well as any plates from the corresponding color work-up can.
   1. New, 18-24 hour, cultures should be read first and set up for ID/MIC as appropriate.
   2. 48-hour cultures from the same color should be read/finalized next.
C. Any colors that were not performed, i.e. no third shift, should be read first before proceeding with the next colors.
D. Cultures with no growth.
   1. Clean catch and indwelling catheter urines
      a. Issue a final report of "52" (No growth, <1,000 cfu/ml)
   2. Specimens collected in a sterile environment: Straight catheter, suprapubic, cystoscopic urines
      a. Issue a prelim report of "53" (No growth to date, <100 cfu/ml)
      b. Reincubate overnight. If there is still no growth, issue a final report of "54" (No growth, <100 cfu/ml)
E. Common pathogenic organisms to be worked up include:
   1. Gram negative rods
   2. Staphylococcus aureus
   3. Coagulase Negative *Staphylococci* – ID and AST only if >100,000 and pure
   4. Beta hemolytic *Streptococci*
   5. *Enterococcus species*
   6. *Aerococcus species*
   7. Yeast
F. Normal flora can be described as, but not limited to:
   1. *Streptococcus species*
   2. *Staphylococcus species*
   3. Gram negative rods
   4. *Corynebacterium species*
   5. *Lactobacillus species*
   6. Yeast
G. Common skin flora organisms may be considered pathogens if ≥100,000 CFU/mL or predominating
H. MICs are performed on appropriate organisms. In general *S. saprophyticus, Micrococcus,* Beta-hemolytic Streptococcus species, *Alpha hemolytic Streptococci*, Gram positive rods, and yeast are excluded
I. Any amount of Streptococcus agalactiae (Group B Streptococcus) should be reported on women of child bearing age (15-40 years of age)
J. Colony counts are interpreted from the Blood Agar Plate (BAP)
   1. Clean catch and indwelling catheter colony counts are based on the use of the 0.001 calibrated urine loop.
      a. 1 colony = 1,000 cfu/ml
   2. Suprapubic, cystoscopic, straight catheter, and nephrostomy counts are based on the use of the 0.01 calibrated loop.
      a. 1 colony = 100 cfu/ml
K. See "Culture Reading Protocol" for appropriate urine culture workup.

IV. CULTURE READING PROTOCOL




Specimen Type
Straight Cath
<10,000 CFU/ ml
1 or 2 organisms ≥10,000 CFU/ml
3 or more organisms
Report as normal flora. No further workup unless requested by physician.
Perform identification and susceptibility testing.
No further workup. Finalize as MIX3 “56” . Save a representative plate.


Specimen Type
Aseptically Collected Urine (Nephrostomy, Suprapubic, cystoscopic)
1 or 2 organisms <10,000 CFU/ ml
1 or 2 organisms ≥10,000 CFU/ml
3 or more organisms
Descriptive ID. No further workup unless requested by physician.
Perform identification and susceptibility testing.
No further workup. Finalize as MIX3 “56” . Save a representative plate.

V. REPORTING RESULTS

A. Resulting in Epic Beaker
   1. Select result entry and scan the barcode label on the plate.
      a. Verify patient information in LIS matches patient information on plate.
   2. Click on "Edit"
   3. Report the quantity and organism(s) and workup according to culture reading protocol.
   4. For any organisms not requiring sensitivities a comment stating "No Further Workup" should be added.
   5. Document all components tested in "workup" tab.
   6. Add the appropriate panel type for organism being tested.
   7. Prelim or final verify results as appropriate.
   8. If susceptibilities are performed, finalize culture after all susceptibilities are complete.

VI. CRITICAL DETERMINANTS

A. Collect specimen before administering antimicrobial agents.
B. Collect specimens with as little contamination from skin flora as possible to ensure that the sample will be representative of the infected site.
C. For a complete list of critical determinants refer to the Laboratory Collection Manual.
D. Unusual results should be brought to the attention of the Microbiology Supervisor and/or Medical Director.

VII. REFERENCES

A. Jorgensen, J. H., Pfaller, M. A., Carroll, K. C., Landry, M. L., Funke, G., Richter, S. S., et al. (2015). *Manual of Clinical Microbiology 11th Edition American Society for Microbiology.* Washington: ASM Press.
B. Weber, A. L. (2016). *Clinical Microbiology Procedures Handbook 4th Edition American Society for Microbiology.* Washington: ASM Press.
C. A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2018 Update by the Infectious Diseases Society of America and the American Society for Microbiology. CID 2018:67 (15 September).
D. Gupta K, Hooton TM, Naber KG, et al. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: a 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011; 52:e103–120.