

Indications for Urine Culture

The Ontario Association of Medical Laboratories has developed this document to provide practitioners with a guideline for the use of urine culture. The guidelines represent the consensus thinking of a panel of experts in the field. Guidelines are, by their nature, general in focus and cannot apply in every clinical situation. They do not serve as a substitute for sound clinical judgement. **These guidelines are appropriate at the time of writing and are applicable in most clinical situations.**

Background:

Semiquantitative urine culture (urine Culture & Sensitivity (C & S)) is the most commonly performed bacteriological test. More than 70% of urine C & S specimens obtained in a community setting yield no growth or growth of doubtful significance.

Objective:

It is the purpose of this guideline to:

- Provide a framework for ordering a urine culture;
- Suggest an alternative screening test to avoid unnecessary and costly urine cultures
- Review preparation and collection criteria in order to optimize test results.

Critical Criteria for Selection of Patients for Testing:

1. Current Canadian and US guidelines do not recommend urine culture as part of screening periodic health examinations of asymptomatic infants, children ⁽¹⁾ or the elderly ⁽²⁾.
2. Some guidelines recommend that urine culture is unnecessary if short-term therapy has been prescribed for uncomplicated UTI in female patients ^(3,4).
3. Urine Culture should be ordered once, during the first trimester, for asymptomatic pregnant women
4. Urine culture should be ordered for patients with symptoms and risk factors for urinary tract infection. Clinical judgement should be exercised in ordering urine cultures for asymptomatic individuals with one or more risk factors. The risk factors are listed in the following table.

TABLE 1: Risk factors for Urinary Tract Infection

<ul style="list-style-type: none">• Previous leukocyte esterase and or nitrates in urine• Recurrent urinary tract infections• Pregnancy• Less than 3 years of age• Diabetes• Recent urological surgery/cystoscopy• Neurogenic bladder	<ul style="list-style-type: none">• Established renal disease• Renal transplant• Genitourinary problems (nephrolithiasis, bladder calculi, congenital or developmental anatomic abnormalities)• Treatment failure for uncomplicated cystitis
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Screening for Significant Bacteriuria

When in doubt, chemical urinalysis including leucocyte esterase and nitrite can help to rule out the need for urine culture. This may be carried out in a physician's office providing that the instrument required to read the strip is available. A recent Chedoke-McMaster Hospital study of 1900 inpatient and outpatient urine specimens from patients over 3 years of age confirmed that significant bacteriuria is accompanied by a positive Chemstrip test for one or more of nitrite, leukocyte esterase, or protein in 76% of the urine samples sent for culture ⁽⁵⁾.

Urinalysis that is negative for nitrite, leucocyte esterase and protein reduces the probability of significant bacteriuria. High glucose concentrations may interfere with the leucocyte esterase assay, therefore, samples with glucose greater than 55 mmol/L should be cultured. Urinalysis will provide a rapid result when the need for urine culture is in doubt. Because the human eye cannot distinguish subtle colour changes reliably, the chemical urinalysis tests (dipstick) must be read by an appropriate instrument ⁽⁶⁾.

Recommendations:

1. It is NOT appropriate to use urine culture as a screening test in the general population.
2. It is a reasonable clinical practice NOT to culture urine in women with infrequent episodes of "classical" cystitis in which antibacterials will be administered on clinical grounds. *(It should be noted that clinical response to a drug would not necessarily relate to the standard antibiogram because the drug is often concentrated in the urine to more than 50 times its tissue level.)*

In the environment of reducing the emergence of multiple resistant organisms, this phenomenon suggests that traditional older drugs such as the penicillins and sulfonamides are usually fully effective.

3. In cases with less obvious symptomatology such as mild intermittent dysuria, one might choose to screen for the presence of nitrite, protein, or leukocyte esterase in a urinalysis before proceeding to culture.

4. In all instances, a properly collected specimen, including instruction in cleansing and mid-stream passage will provide more meaningful and accurate results. Specimens should be immediately stored on ice or refrigerated and sent for analysis as soon as possible. If delays are expected, the use of urine stabilizers will reduce the occurrence of erroneous results. Bagged urine specimens from infants are not reliable for urine culture but can be used for urinalysis.

Conclusion:

Urine culture and antibiotic susceptibility testing is a costly and time-consuming procedure. It should be ordered thoughtfully.

References:

1. Canadian Guide to Clinical Preventive Health Care. Ottawa Canada 1994 reviewed 1999
2. Canadian Guide to Clinical Preventive Health Care. Ottawa Canada 1994 reviewed 1998
3. Protocol for Macroscopic and Microscopic Urinalysis and Investigation of Urinary Tract Infection. Effective March 31, 1998 Protocol Steering Group BC. British Columbia Ministry of Health
4. University of Michigan Health System, Urinary Tract Infection Guideline Team 1999
5. D. McClorry, F. Smaill, J. Gun-Munro, H. Richardson & the Urine Screening Team (1999) Effectiveness of Miles Multistix 10 SG as a Screening Test for Bacteriuria, Chedoke-McMaster
6. Holland, D. J., Bliss, K. J., Allen, C. D., & Gilbert, G. L. (1995). A Comparison of Chemical Dipsticks Read usually or by Photometry in the Routine Screening Of Urine Specimens in the Clinical Microbiology Laboratory. *Pathology* **27**, 91-96.

The Ontario Association of Medical Laboratories

The Ontario Association of Medical Laboratories (OAML) represents the community-based laboratory sector in Ontario.

Its mission is to promote excellence in the provision of laboratory services and, as an essential component of the health care system, to contribute to shaping the future of health care in Ontario.

The OAML encourages the highest level of professional and ethical integrity and technical excellence among laboratory owners, operators and staff in the provision of laboratory services for the benefit of the people of Ontario.

<p>Guidelines for Clinical Laboratory Practice</p> <p>The OAML, through its Quality Assurance and Clinical Laboratory Practice Committee, co-ordinates the development and dissemination, implementation and evaluation of Guidelines for Clinical Laboratory Practice.</p> <p>A proposed Guideline is developed by a working group of the Committee with the participation of outside experts. The proposed guideline is then submitted to the Committee as a whole and to a Professional Advisory Group who provide an overall review of the document. The comments of the Committee and the Professional Advisory Group are incorporated into a revision of the guideline and this draft is submitted to laboratory Medical Directors, professional associations and other representatives of end users for additional comment. The document is revised in light of these comments and submitted to the OAML Board of Directors for approval.</p> <p>Approved guidelines are distributed to Community-based Laboratories and by them to their client physicians.</p>	<p>There may be additional educational materials produced, if it is thought that they might be useful, and these are distributed with the guideline.</p> <p>The comments of end users are essential to the development of guidelines and will encourage adherence. You are strongly encouraged to submit your comments on this or on any other OAML Guideline to:</p> <p>Chair Quality Assurance and Clinical Laboratory Practice Committee Ontario Association of Medical Laboratories 5160 Yonge Street, Suite 710 North York, Ontario M2N 6L9</p> <p>Tel: (416) 250-8555 Fax: (416) 250-8464 E-mail: oaml@oaml.com Internet: http://www.oaml.com</p>
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