

## LABSTRACT – OCTOBER 2019

# Reference Bacteriology and Antimicrobial Susceptibility: New Requisition and Testing Algorithm for Improved Test Utilization

## Audience

Clinical laboratories that perform bacteriology culture and refer isolates to Public Health Ontario (PHO) Laboratory for identification and susceptibility testing.

## Overview

PHO is committed to appropriate test utilization and improving patient safety through the appropriate use of antimicrobials. Consistent with the principles of antimicrobial stewardship and recommendations by the Institute for Quality Management in Healthcare<sup>1-3</sup> (IQMH), the Infectious Diseases Society of America<sup>4</sup> and others<sup>5-8</sup>, PHO Laboratory is making changes in the area of bacterial identification and susceptibility testing which will take place effective 10/01/2019.

Furthermore, our Reference Bacteriology Requisition form, which can be found at the end of this labstract, has been updated to capture additional information necessary for us to determine the extent to which an isolate is worked up for identification and susceptibility testing to optimize utilization.

## Changes to the requisition form

The updated requisition has several changes and new fields that must be completed in order to provide timely results. It is essential that the requisition be filled out fully and accurately – this ensures that the most appropriate work-up is conducted:

- A new field to indicate the date of specimen collection has been added (Section 6)
- New **mandatory** fields regarding details of the primary source of the isolate (Section 7) such as:
  - The number of sets of positive blood cultures within 24 hours
  - The type of urine specimen(s) (e.g. midstream, indwelling catheter, cystoscopy etc.)
  - The site and type of a wound swab; be as specific as possible (e.g. animal bite, surgical wound, decubitus ulcer etc.)
  - The type of specimen if other than blood culture, urine or wound swab, please provide as much detail as possible

# Changes to reference bacteriology identification and susceptibility testing

When the identification of bacteria from clinical specimens is unknown, it can be difficult to determine upfront if it is clinically relevant and if susceptibility testing is required for patient care. Once the identification is made, it may be determined that the particular microorganism, from that specimen type, likely represents a common contaminant or commensal flora and that antimicrobial susceptibility testing is **not** necessary or appropriate.

Consistent with principles of appropriate test utilization, the following changes will take place for the testing of the bacteria listed in Appendix A cultured from urine, lower respiratory tract specimens (e.g. sputa), wound/drainage:

- Limited bacterial identification will be performed to the extent to which phenotypically similar but medically important organisms can be safely excluded
- For bacteria not normally considered to be pathogenic, susceptibility testing will not routinely be performed
- For mid-stream urine, urine from in and out catheterization or urine from indwelling catheters
  - Limited identification and **no** susceptibility testing will be performed on the organisms listed in Appendix A

For blood cultures, the following algorithm changes will be implemented:

- If only one set of blood culture bottles is positive with an organism listed in Appendix A within a 24 hour timeframe, limited identification and no susceptibility testing will be performed
- NOTE: The list of organisms in Appendix A does **not** apply to neonatal blood cultures or those from individuals identified on the requisition as being immunocompromised

## IMPORTANT NOTES:

1. Where full bacterial identification and susceptibility testing is clinically indicated, such as for an immunocompromised patient, please clearly indicate this on the requisition.
2. For critical specimens (e.g. CSFs), surgically collected specimens (e.g. tissues) and other sterile sites specimens (e.g. synovial fluids) full identification and susceptibility testing will continue to be performed.

## What this means to you

Accurate completion of **all** sections of the Reference Bacteriology Requisition form will support timely and appropriate specimen handling and testing which will result in optimal test utilization and turnaround time for identification and susceptibility testing of the isolate.

- Effective 10/01/2019 you must use the updated form which is available on <http://www.publichealthontario.ca/requisitions;>

- Complete the mandatory, 'Source of isolation' field (Section 7) on the form. If this information is absent, the specimen will be rejected for testing with the comment "This isolate has been rejected for testing as the 'Source of Isolation' has not been indicated. Please submit a fully completed Reference Bacteriology Requisition". The specimen will be held for one week after it is received and tested only when appropriate information has been provided.
- If your laboratory uses an electronic version of this form, you must update your laboratory information system to generate the new form.
- Other than the scenarios described in Appendix A, full identification and/or susceptibility testing will continue to be performed on sterile site isolates; for all others, identification and susceptibility testing will be performed only on special request by the healthcare provider based on clinical relevance.
- Failure to provide all mandatory information on the updated form will result in rejection of the susceptibility testing request. If the healthcare provider requires susceptibility testing, the submitter must call within 5 days of receiving final results and provide necessary information and justification for susceptibility testing results.

## Appendix A

Organisms commonly considered to be contaminants/commensal flora for which limited identification and susceptibility testing will be performed (this is not to be considered a complete list)

Source	Organism
Single Positive Blood Culture <sup>1, 3-6</sup>	<ul style="list-style-type: none"> <li>Coagulase- negative <i>Staphylococcus</i> and related organisms (e.g. <i>Micrococcus</i> spp, <i>Rothia</i> spp), not including <i>S. lugdunensis</i></li> <li>“Viridans group Streptococci”</li> <li><i>Corynebacterium</i> spp and related organisms (e.g. <i>Arthrobacter</i> spp), not including <i>C. diphtheriae</i></li> <li><i>Bacillus</i> spp and related organisms (e.g. <i>Paenibacillus</i> spp, <i>Lysinibacillus</i> spp etc), not including <i>B. anthracis</i></li> <li><i>Neisseria</i> spp other than <i>N. meningitidis</i> or <i>N. gonorrhoeae</i></li> <li><i>Propionibacterium</i> spp and <i>Cutibacterium</i> spp</li> </ul>
Urine <sup>8</sup>	<ul style="list-style-type: none"> <li><i>Lactobacillus</i> spp</li> <li>Viridans group <i>Streptococcus</i></li> <li>Coagulase- negative <i>Staphylococcus</i> and related organisms (e.g. <i>Micrococcus</i> spp, <i>Rothia</i> spp)</li> <li><i>Corynebacterium</i> spp and related organisms (e.g. <i>Arthrobacter</i> spp), not including <i>C. urealyticum</i>, <i>C. glucoronolyticum</i> and <i>C. pseudogenitalium</i></li> <li><i>Bacillus</i> spp and related organisms (e.g. <i>Paenibacillus</i> spp, <i>Lysinibacillus</i> spp etc.), not including <i>B. anthracis</i></li> <li><i>Neisseria</i> spp other than <i>N. meningitidis</i>, <i>N. gonorrhoeae</i></li> </ul>
Lower Respiratory Tract Specimens <sup>2,7, 9</sup>	<ul style="list-style-type: none"> <li>Viridans group <i>Streptococcus</i></li> <li><i>Neisseria</i> spp including <i>N. meningitidis</i> (identification only)</li> <li>Coagulase- negative <i>Staphylococcus</i> and related organisms (e.g. <i>Micrococcus</i> spp, <i>Rothia</i> spp), not including <i>S. lugdunensis</i></li> <li><i>Corynebacterium</i> spp and related organisms (e.g. <i>Arthrobacter</i> spp), not including <i>C. pseudodiphtheriticum</i> and <i>C. diphtheriae</i></li> <li><i>Moraxella</i> spp other than <i>M. catarrhalis</i></li> <li><i>Enterococcus</i> spp</li> </ul>
Wound swab and Drainage <sup>3</sup>	<ul style="list-style-type: none"> <li>Coagulase -negative <i>Staphylococcus</i>, unless isolated from chest/sternum</li> <li>Coagulase -negative <i>Staphylococcus</i>, not including <i>S. lugdunensis</i></li> <li>“Viridans group Streptococci”</li> <li><i>Corynebacterium</i> spp and related organisms (e.g. <i>Arthrobacter</i> spp), not including <i>C. diphtheriae</i></li> <li><i>Bacillus</i> spp and related organisms (e.g. <i>Paenibacillus</i> spp, <i>Lysinibacillus</i> spp etc.), not including <i>B. anthracis</i></li> <li><i>Micrococcus</i> spp</li> <li><i>Neisseria</i> spp other than <i>N. meningitidis</i>, <i>N. gonorrhoeae</i></li> <li><i>Propionibacterium</i> spp and <i>Cutibacterium</i> spp</li> </ul>

### Footnotes:

- Identification and/or susceptibility testing will be performed on organisms commonly considered to be contaminants/commensal flora only on special request by the healthcare provider based on clinical relevance. Contact PHOL Customer Service for these requests.
- For blood culture:
  - This list of organisms does **not** apply to neonatal blood cultures
  - If only one set of blood culture bottles is positive with the listed organisms within a 24 hour timeframe limited identification and no susceptibility testing will be performed
  - For mid-stream urine, urine from in and out catheterization or urine from indwelling catheter, limited identification and no susceptibility testing will be performed on the listed organisms

## References

1. Institute for Quality Management in Healthcare (IQMH): *Consensus Practice Recommendations – BACT-Blood Cultures*. Revision date: 2017-09-28.
2. Institute for Quality Management in Healthcare (IQMH): *Consensus Practice Recommendations – BACT Sputum specimens*. 2013-10-07.
3. Institute for Quality Management in Healthcare (IQMH): *Consensus Practice Recommendations – BACT Superficial wound swabs*. 2013-12-09.
4. Miller JM, Binnicker MJ, Campbell S, Carroll KC, et al. *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*. Clinical Infectious Diseases, Volume 67, Issue 6, 31 August 2018, Pages e1–e94, [doi.org/10.1093/cid/ciy381](https://doi.org/10.1093/cid/ciy381)
5. Clinical and Laboratory Standards Institute (CLSI). *Principles and procedures for blood culture; approved guideline*. CLSI document M47-A, Vol. 27, No. 17. Wayne, Pennsylvania, USA. 2007.
6. Baron EJ, Weinstein MP, Dunne Jr WM, Yagupsky P, Welch DF, Wilson DM. 2005. *Cumitech 1C, Blood Cultures IV*. Coordinating ed., EJ Baron. ASM Press, Washington DC.
7. Sharp SE, Robinson A, Saubolle MA, Santa Cruz M, Carroll K, Baselski V. 2004. *Cumitech 7B, Lower respiratory tract infections*. Coordinating ed., SE Sharp. ASM Press Washington, DC.
8. McCarter YS, Burd EM, Hall, GS, Zervos M. 2009. *Cumitech 2C, Laboratory Diagnosis of Urinary Tract Infections*. Coordinating ed. SE Sharp. ASM Press, Washington, DC.
9. Waites KB, Saubolle MA, Talkinton DF, Moser SA, Baselski V. 2006, *Cumitech 10A, Laboratory Diagnosis of Upper Respiratory Tract Infections*. Coordinating ed. SE Sharp. ASM Press, Washington, DC.

## Reference Bacteriology Requisition

<b>1 - Submitter</b> <p>Courier code</p> <p>Provide Return Address:</p> <p>Name Address City &amp; Province Postal Code</p>	<b>2 - Patient Information</b> <p>Health No. / HRN:</p> <p>Date of Birth: yyyy / mm / dd Sex:</p> <p>Last Name: (per health card) First Name: (per health card)</p> <p>Address:</p> <p>City: Postal code:</p>
<p>Clinician initial / Surname and OHIP / CPSO Number</p> <p>Tel: Fax:</p>	<p>Submitter lab no. (if applicable):</p> <p>Public Health Unit Investigation/ Outbreak No.:</p>
<b>3 - Test(s) Requested</b> <p><input type="checkbox"/> identification <input type="checkbox"/> confirmation <input type="checkbox"/> antimicrobial susceptibility</p> <p><input type="checkbox"/> typing - (specify):</p> <p><input type="checkbox"/> other - (specify):</p>	<b>6 - Date of Collection of primary specimen:</b> <p>Date: yyyy / mm / dd</p>
<b>4 - Culture Information</b> <p><input type="checkbox"/> Presumptive identification</p> <p><input type="checkbox"/> Gram morphology:</p> <p><input type="checkbox"/> aerobic <input type="checkbox"/> anaerobe <input type="checkbox"/> microaerophile</p> <p><input type="checkbox"/> fermenter <input type="checkbox"/> oxidizer</p> <p>oxidase pos <input type="checkbox"/> neg <input type="checkbox"/> catalase pos <input type="checkbox"/> neg <input type="checkbox"/> MacConkey growth <input type="checkbox"/> No growth <input type="checkbox"/></p>	<b>7 - Source of isolation (MANDATORY INFORMATION)</b> <p>Blood Number of sets ordered:</p> <p><input type="checkbox"/> 1 positive set within 24 hours</p> <p><input type="checkbox"/> ≥ 2 positive sets or more within 24 hours</p> <p>Urine <input type="checkbox"/> Midstream <input type="checkbox"/> Indwelling Catheter</p> <p><input type="checkbox"/> Cystoscopy <input type="checkbox"/> Other:</p> <p>Wound - (please specify site and type)</p> <p>Surveillance / screen (sites) <input type="checkbox"/></p> <p>Other - (please specify)</p>
<b>5 - Clinical diagnosis:</b> 	<b>8 - Epidemiological information</b> <p><input type="checkbox"/> Recent travel <input type="checkbox"/> Outbreak</p> <p><b>9 - Person to contact (please print name)</b>  <p>First name:</p> <p>Last name:</p> <p>Telephone no./ext.: ( )</p> </p>

**Please Note:**

• This form is available at <http://www.publichealthontario.ca/requisitions>

The personal health information is collected under the authority of the Personal Health Information Protection Act, 2004, s.36 (1)(c)(iii) for the purposes specified in the Ontario Agency for Health Protection and Promotion Act, 2007, s.1 and will be used for surveillance and other public health purposes. If you have questions about the collection of this personal health information please contact the PHOL Manager of Customer Service at 416-235-6556 or toll free 1-877-604-4567.

## For further information

- Contact the PHO Customer Service Centre at 416-235-6556 or 1-877-604-4567 (toll-free), or by email at [customerservicecentre@oahpp.ca](mailto:customerservicecentre@oahpp.ca)
- For PHO Laboratory specimen collection information and previous Lababstracts, refer to [publichealthontario.ca/test directory](http://publichealthontario.ca/test-directory)
- The current version of the PHO Laboratory General Test Requisition and other forms are available at [publichealthontario.ca/Requisitions](http://publichealthontario.ca/Requisitions)
- To subscribe to future Lababstracts, [register on our website](#)
- To register for Autofax and receive laboratory reports by fax directly from our laboratory information system as soon as they are released, contact the PHO Laboratory Customer Service Centre.