



Clinical Practice Change: Clinical Microbiology

Date: November 7, 2016

To: All Manitoba Physicians and Healthcare Staff served by a Diagnostic Services Manitoba (DSM) Clinical Microbiology Laboratory at the Health Sciences Centre (HSC), St. Boniface Hospital (SBH), and Westman Laboratory (WL)

From: Dr. James Karlowsky, Medical Director, Clinical Microbiology, DSM
Joelle Carlson, Technical Director, Clinical Microbiology, DSM

Re: Rapid Identification of Bacterial Pathogens in Positive Blood Cultures

TAKE HOME MESSAGE:

Effective November 7, 2016: Healthcare providers (HCPs) that submit blood cultures to a DSM Clinical Microbiology Laboratory at HSC, SBH, or WL will shortly begin receiving final identities of bacteria growing in positive blood cultures in as little as 4 hours following receipt of the initial Gram stain result. These results are critical values and the Clinical Microbiology Laboratory will be telephoning HCPs directly to expedite reporting as currently done for initial Gram stain results. Therefore, HCPs should expect additional phone calls from the Clinical Microbiology Laboratory to accommodate this improvement to patient care.

Clinical Microbiology Laboratories at the HSC, SBH, and WL have begun identifying bacteria using a new, rapid method called MALDI-ToF (Matrix Assisted Laser Desorption/Ionization-Time of Flight) mass spectrometry. This method can be applied to positive blood culture bottles following a 4-hour sub-culture from the positive bottles to agar culture media. The Clinical Microbiology Laboratories at the HSC, SBH, and WL have now validated this method for clinical use.

This application of MALDI-ToF is useful for many, but not all, species of bacteria. MALDI-ToF can provide rapid identification for: aerobic (e.g., *Pseudomonas aeruginosa*), facultative (e.g., *Escherichia coli*, *Klebsiella* spp., *Enterobacter* spp.), and anaerobic (e.g., *Bacteroides* spp.) Gram-negative bacilli and cocci; Gram-positive cocci showing clusters in their Gram stain (i.e., *Staphylococcus* spp.); and anaerobic, large Gram-positive bacilli (*Clostridium* spp.). The expectation is that MALDI-ToF will be able to provide an identification for 90% of isolates in the above groups. Invariably other organisms will also be identified that do not fit into one of the above groups, these identifications will also be reported to healthcare providers if deemed reliable.

MALDI-ToF cannot be relied on for the identification of Gram-positive cocci in chains (i.e., *Streptococcus* spp.) and *Streptococcus* spp. will continue to be identified using our current laboratory methods.



Physician Alert



It is important to recognize that the organisms identified by MALDI-ToF will be both pathogens and contaminants, that the final determination of pathogenicity will continue to reside with healthcare providers, and that not all reports will provide actionable results.

Antimicrobial Susceptibility Testing (AST) results will continue to be generated by the Clinical Microbiology Laboratory over the same timeframe as in the past as rapid bacterial identification by MALDI-ToF is distinct from laboratory methods required to perform and report AST results.

The rapid bacterial identification results generated by MALDI-ToF for positive blood cultures are critical values. As for all critical results, staff from the Clinical Microbiology Laboratory will provide the report to the healthcare provider by telephone and request that the result be read back to ensure the message was relayed reliably. The Clinical Microbiology Laboratory must also document the name of the person taking the result. Both of these steps are requirements for Clinical Microbiology Laboratory certification. It is imperative that the telephoned results be passed on to the patient's clinical decision maker. Therefore, healthcare providers should expect additional phone calls from the Clinical Microbiology Laboratory regarding positive blood cultures to accommodate this improvement to patient care as this information may be important to antibiotic treatment decisions for patients.

This new service will initially be provided 7 days a week for all blood cultures turning positive during the day shift at the HSC, SBH, and WL. Results may be telephoned to healthcare providers as late as 20:00h. The hours of provision of this service will be reviewed at a later date to determine its utility.

If you have any questions or require further information, please contact Dr. James Karlowsky at 204-237-2105 or Joelle Carlson at 204-237-2073.