



MLS: Laboratory Update **Detection of a Rare Metallo-beta-lactamase Resistance in *Klebsiella pneumoniae***

September 23, 2010

Purpose of this Message

To inform the healthcare community about a recent CDC-Morbidity and Mortality Weekly Report (MMWR) describing the “Detection of a Verona Integron-encoded metallo-beta-lactamase (VIM) in *Klebsiella pneumoniae*” in a U. S. patient.

Background

CDC recently released the Morbidity and Mortality Weekly Report (MMWR), “Detection of a Verona Integron-Encoded Metallo-Beta-Lactamase (VIM) in *Klebsiella pneumoniae* - United States, 2010” (<http://www.cdc.gov/mmwr/pdf/wk/mm59e0921.pdf>). The patient described in the report received medical care in Greece prior to being hospitalized in the U.S. VIM has been previously described in Greece among both *Enterobacteriaceae* and *Pseudomonas*. This is the first known U.S. case of VIM among *Enterobacteriaceae* however, VIM has been infrequently reported among *Pseudomonas* in the U.S.

The recent reports of New Delhi Metallo-beta-lactamase (NDM-1) and now VIM underscore the importance of newly emerging carbapenem resistant *Enterobacteriaceae* (CRE). Laboratories are encouraged to submit CRE as described in Laboratory Guidance below.

Despite reports of NDM-1 CRE and now VIM CRE, it is important to note that the *K. pneumoniae* carbapenemase (KPC) enzyme remains the most common mechanism of carbapenem resistance among *Enterobacteriaceae* in the United States. Importantly KPC, NDM-1, and VIM appear to be plasmid mediated and can therefore be transferred across *Enterobacteriaceae* species.

Infection Prevention and Control

Infection prevention and control should be implemented immediately upon identification of CRE, in all healthcare facilities, regardless of the resistance mechanism.

CDC: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm?s_cid=mm5810a4_e

MDH: <http://www.health.state.mn.us/divs/idepc/dtopics/cre/index.html>

Additionally, acute care facilities should:

- (1) Perform active surveillance testing of patients with epidemiologic links to CRE-positive patient (e.g., patients in the same unit or who have been cared for by the same healthcare personnel).

- (2) Review microbiology records for the preceding 6 – 12 months to identify previously unrecognized CRE cases.
- (3) If previously unrecognized CRE are found, perform one round of active surveillance testing among patients exposed to CRE patient (e.g. roommates).

Guidance for Laboratories

MDH and CDC are monitoring the emergence of KPC and metallo-beta-lactamases in *Enterobacteriaceae*. Please call the MDH-PHL laboratory (651-201-5073) and refer isolates to MDH-PHL for additional testing if your laboratory identifies *Enterobacteriaceae* organisms that have elevated MIC's for the carbapenems, specifically if:

- the MIC for ertapenem is ≥ 1 $\mu\text{g/ml}$ and/or; the imipenem or meropenem are ≥ 4 $\mu\text{g/ml}$ (all considered 'resistant' by new CLSI standards – June 2010); AND
- the isolate is resistant to at least one 3rd generation cephalosporin.

We encourage laboratories to refer all CRE isolates to MDH-PHL. Currently, since the most common CRE is the *Klebsiella pneumoniae* Carbapenemase (KPC), MDH-PHL continues to encourage laboratories to perform the Modified Hodge Test (MHT) on all CRE isolates prior to sending to MDH-PHL. MDH is also encouraging all laboratories to use the new CLSI (June 2010) carbapenem breakpoints.

For Additional Laboratory Information

- (1) MN Laboratory System (MLS)/MDH website: www.health.state.mn.us/mls under “Disease Specific Information” click on the *Klebsiella pneumoniae* Carbapenemase (KPC).
- (2) CLSI M100-S19 (Performance Standards for Antimicrobial Susceptibility Testing), see Appendix G (pgs.136-139) for details on screening and confirming carbapenemase production.

Questions

MDH is available for consultation regarding laboratory testing and patient management, including surveillance and infection prevention and control measures. Please call the MDH Emerging Infections Unit at 651-201-5414 or 877-676-5414. For laboratory-specific questions call Anita Glennen at 651-201-5034 or Paula Vagnone at 651-201-5581

Thank you for your continued vigilance with these increasingly challenging organisms.

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****Please forward this to all appropriate personnel within your institution and Health System****

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