



**MLS: Laboratory Update**  
***K. pneumoniae* Carbapenemase (KPC) - Producer**  
**Isolated in MN**  
**February 24, 2009**



**\*\*Please forward this to all appropriate personnel within your institution\*\***

This is a routine message from the Minnesota Department of Health (MDH) and the Minnesota Laboratory System (MLS). This message is being sent to MLS laboratory contacts serving Minnesota residents. You are not required to reply to this message.

NOTE: The Minnesota Laboratory System email address has changed to: [mnlabssystem@state.mn.us](mailto:mnlabssystem@state.mn.us)

### **KPC Identified**

A *Klebsiella pneumoniae* isolate referred to the Minnesota Department of Health – Public Health Laboratory (MDH-PHL) from a MN laboratory, has been confirmed, by CDC, as a *Klebsiella pneumoniae* carbapenemase (KPC) producer by PCR. The organism was isolated from an endotracheal site and submitted to MDH-PHL for additional characterization. MDH-PHL and CDC used PCR to detect the plasmid-mediated KPC gene *bla<sub>KPC</sub>*. This is currently an investigational method being validated at MDH-PHL, with positive isolates being forwarded for confirmation to CDC.

### **Why is this Important?**

Identification of a KPC-producing *Enterobacteriaceae* in a healthcare setting represents an infection control emergency. The KPC confers resistance to penicillins, cephalosporins, aztreonam, clavulanic acid, and tazobactam, in addition to carbapenems, making treatment of these infections very challenging. The gene coding for KPC enzymes is present on plasmids, facilitating transmission between species of similar bacteria. While KPC was first recovered from *K. pneumoniae* isolates, it can also be present among other *Enterobacteriaceae* including *E. coli*, *S. marcescens*, *K. oxytoca*, and *Enterobacter* spp. Non-*Enterobacteriaceae* found to have KPC include *Pseudomonas* and *Acinetobacter* spp. however non-KPC carbapenemases are typically more common among these species. A similar notice has also been sent from MDH to Infection Control Practitioners in MN, describing the infection control issues.

### **What Laboratories Should Do**

MDH and CDC are interested in monitoring the emergence of the KPC's. If your laboratory identifies an *Enterobacteriaceae* organism that has elevated MIC's for the carbapenems, it is important to consider KPC's. Specifically, if the MIC for ertapenem is 2 µg/ml and/or the imipenem or meropenem are 2 or 4 µg/ml (considered 'susceptible' by CLSI standards), clinical failures have occurred. Isolates with an MIC of 2 µg/ml or greater, the isolates should be further characterized for carbapenemase production. See Appendix G (pgs. 136-139) in the CLSI M100-S19 document (Performance Standards for Antimicrobial Susceptibility Testing) for details on screening and confirming carbapenemase production.

If your laboratory encounters a potential KPC, please refer the isolate to MDH-PHL for PCR testing.

### **Additional Resources**

1) MLS website: [www.health.state.mn.us/mls](http://www.health.state.mn.us/mls) under "Disease Specific Links" click on the KPC link. Listed are the presentation by Dr. Paul Schreckenberger entitled: "Carbapenem Resistance in *Enterobacteriaceae* – An Infection Control Emergency" and a CDC M.A.S.T.E.R.- KPC case study.

2) CLSI standards document: M100-S19 – Performance Standards for Antimicrobial Susceptibility Testing; 19<sup>th</sup> Informational Supplement; Appendix G, pp. 136-139.

3) Patel G, et al. Outcomes of Carbapenem-Resistant *Klebsiella pneumoniae* Infection and the Impact of Antimicrobial and Adjunctive Therapies. *Infect Control Hosp Epidemiol* 2008; 29:1099-1106

**Who to Contact at MDH**

Please contact MDH-PHL Molecular Epidemiology Supervisor, Dave Boxrud at: 651-201-5257 if you have a suspected KPC isolate in your laboratory.

**Thank You**

Thank you for your assistance as we monitor the emergence of KPC's in Minnesota and across the country.

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