March 31, 2009

IMPORTANT: for all Microbiology Laboratories and Infection Prevention/Control Departments

Detecting antimicrobial resistance continues to get more complicated. In the last 10 years microbiology laboratory staff have continually added more manual tests to their workload, in order to detect MRSA, VISA and VRSA, inducible clindamycin resistance, ESBLs….the list goes on.

The evidence is now clear that we also need to be looking for Gram-negative rods, especially *Enterobacteriaceae,* that produce a specific type of ESBL enzymes called KPCs. These enzymes hydrolyze **all** the Beta-lactam antibiotics, making the organism resistant to our last "big-gun" drugs, the carbapenems.

This is by far one of the most challenging types of antimicrobial resistance to detect. Everyone has struggled both with trying to understand the topic, and with doing the testing in their laboratories.

These organisms, *Klebsiella* species and *E. coli* in particular, often appear susceptible in our tests; and there are some limitations with the automated instrument rules. Yet because they are resistant to more classes of drugs than "traditional" ESBLs, it is imperative that we find them.

The March 20, 2009 MMWR, does provide some help: *Guidance for Control of Infections with Carbapenem-Resistant / Carbapenemase-Producing Enterobacteriaceae in Acute Care Facilities*. The CDC is now calling these CRE (carbapenem-resistant *Enterobacteriaceae*) and CRKP (carbapenem-resistant *K.pneumoniae*).

These organisms should be considered infection control emergencies, and require *aggressive detection and control strategies.* **We urge everyone to read this important article** on pages 256-260. Please note that these organisms are not confined to large health care facilities! The box on **page 259 summarizes** what every one should do, both in the laboratory and in the hospital. Here is a link to the MMWR:

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5810a4.htm

http://www.cdc.gov/mmwr/PDF/wk/mm5810.pdf
(printable format)

If you have not started looking for these in your laboratory:

> See the CLSI document M100-S19 (January 2009) - **Appendix G** on **pages 136-139** - for a summary of **how to screen for and confirm** the presence of this resistance, especially in ***E. coli*** and ***Klebsiella*** species. All microbiology laboratories in Michigan should have received a copy of M100-S19 from MDCH in early February. Please contact us if you did not receive one.

If you need written procedures:

Three laboratory testing procedures (already written for you in CLSI format) are available on the Internet:

1. **Rectal swab surveillance culture** to identify patients colonized with *Klebsiella* and *E. coli* which are producers of these resistance enzymes

2. **Modified Hodge Test** to confirm whether an *E. coli* or *Klebsiella* isolate (after you follow the CLSI screening criteria) is producing the KPC enzyme

Both of these are available at:

http://www.cdc.gov/ncidod/dhqp/ar_kp_lab.html

3.**Ten-Disk Procedure** for Detection of Antibiotic resistance in *Enterobacteriaceae* (method used in Loyola University Medical Center):

http://hardydiagnostics.com/articles/Antibiotic-Resistance-in-GNB.pdf

If you would like to learn more:

CDC has posted an **audio conference** on **Carbapenem-Resistant *Enterobacteriaceae*** (CRE) on their webpage. This presentation is free, and covers many aspects of this urgent problem. (Power Point, MP3 audio, and written transcript):

http://www.bt.cdc.gov/coca/callinfo.asp

What to do about reporting results:

Whether or not to change the results of carbapenem testing has been somewhat controversial. Current CLSI guidance (M100-S19, 2009) recommends that we **do not change the results,** but report the MIC value **without an interpretation** and ***add a comment*** to the report alerting the physician to the presence of a carbapenemase.

Others have suggested changing carbapenem "S" results to "I" and "I" to "R" based on the MIC value. We encourage you to discuss this decision with hospital medical staff.

Does MDCH want these isolates?

Again, this is a complex issue. We are exploring the best ways for us here at MDCH BOL to support your testing, and plan to issue more specific guidance soon. Meanwhile, if you recover a suspect CRE and test results are inconclusive, please feel free to contact us for confirmatory testing.

Sincerely,

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