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NPHL ALERT

March 31, 2023

In coordination with the Nebraska Department of Health and Human Services (NDHHS), the Nebraska Public Health Laboratory (NPHL) will be adjusting their testing algorithm for carbapenem-resistant Enterobacterales (CRE), carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) and carbapenem-resistant *Acinetobacter baumannii* (CRAB) effective April 10th, 2023 to detect for the presence of a carbapenemase-producing Enterobacterales (CPE), *P. aeruginosa* (CP-PA) or *A. baumannii* (CP-CRAB). The previous testing algorithm began with a molecular assay (CARBAR) for the detection of *bla*_{KPC}, *bla*_{NDM}, *bla*_{VIM}, *bla*_{OXA-48}, and *bla*_{IMP} gene sequences, which are the genes most associated with carbapenem resistance. NPHL will transition to the modified carbapenem inactivation method (mCIM) under order code MCIMAR. This new method will allow for the detection of any carbapenem resistance mechanism, not just the mechanisms associated with the five listed genes. There will be no change in Specimen Guidelines for the transition to this new test.

The testing for a CPE, CP-PA and CP-CRAB is a surveillance program to monitor for increasing carbapenem resistance across the state of Nebraska. Since this is for epidemiological purposes only and not for patient care, the results of the mCIM, under order code MCIMAR, will not go to the submitting facility. Instead, the facility will receive an autogenerated message upon receipt of the submitted isolate to the NPHL thanking them for submission. If the mCIM method indicates that a CPE, CP-PA or CP-CRAB is present, a reflex CARBAR will be automatically ordered, and results of this testing will flow back to the facility which initially submitted the isolate to NPHL. Therefore, facilities should operate under a “No News is Good News” approach to submission of isolates for CPE, CP-PA, CP-CRAB surveillance. If testing at NPHL indicates that a carbapenemase gene is present (either a positive CARBAR and/or a positive mCIM), the NDHHS team will be reaching out to provide further guidance. Finally, NPHL will be performing a whole genome sequence of all mCIM positive isolates that are CARBAR negative to attempt to identify the carbapenemase gene to enhance the epidemiological surveillance program.

The new assay is currently orderable in NULirt under order code MCIMAR and facilities are welcome to transition to the new testing algorithm at any point between now and April 10, 2023. A CARBAR order will no longer be available for submitting facilities beginning at this time to encourage all submitting facilities to adopt to the new testing approach. The NPHL Test Request and Supplemental Carbapenem Resistance forms will be adjusted to reflect this change and will be available on the NPHL website, www.nphl.org, by the transition date.

Effective Date: April 10, 2023
Test Name: Modified Carbapenem Inactivation Method
Test Code: MCIMAR



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Specimen Guidelines:

- A fresh subculture (<18 hours) is optimal to avoid a delay in testing.
- Submit isolates of Enterobacterales and/ or *Pseudomonas aeruginosa* and/or *Acinetobacter baumannii* that are non-susceptible (intermediate or resistant) to carbapenems as mentioned below:
 - Enterobacterales: Ertapenem MIC ≥ 1 $\mu\text{g}/\text{mL}$, or meropenem MIC ≥ 2 $\mu\text{g}/\text{mL}$, or imipenem MIC ≥ 2 $\mu\text{g}/\text{mL}$, or non-susceptible by disc diffusion method (*See rare exceptions below*)
 - *Pseudomonas aeruginosa*: Meropenem or imipenem MIC ≥ 4 $\mu\text{g}/\text{mL}$ or non-susceptible by disc diffusion method and in each case also non-susceptible to both cefepime and ceftazidime at MIC ≥ 16 $\mu\text{g}/\text{mL}$
 - *Acinetobacter baumannii*: Doripenem ≥ 4 $\mu\text{g}/\text{mL}$ or imipenem ≥ 4 $\mu\text{g}/\text{mL}$ or meropenem ≥ 4 $\mu\text{g}/\text{mL}$ or non-susceptible by disc diffusion method
 - Submit all isolates of in-house or reference laboratory confirmed carbapenemase-producing Enterobacterales (CPE) or *Pseudomonas aeruginosa* (CP-PA) or *Acinetobacter baumannii* (CP-CRAB)
- Exceptions:
 - DO NOT submit the following isolates
 - *Proteus* species, *Providencia* species, or *Morganella morganii* non-susceptible only to imipenem but susceptible to meropenem and ertapenem
 - *Pseudomonas aeruginosa* that are mucoid or from cystic fibrosis patients