

Michigan Department of Community Health Laboratory Confirmatory Testing for Carbapenem-Resistant *Enterobacteriaceae* (CRE)

Overview

Clinical Laboratory:

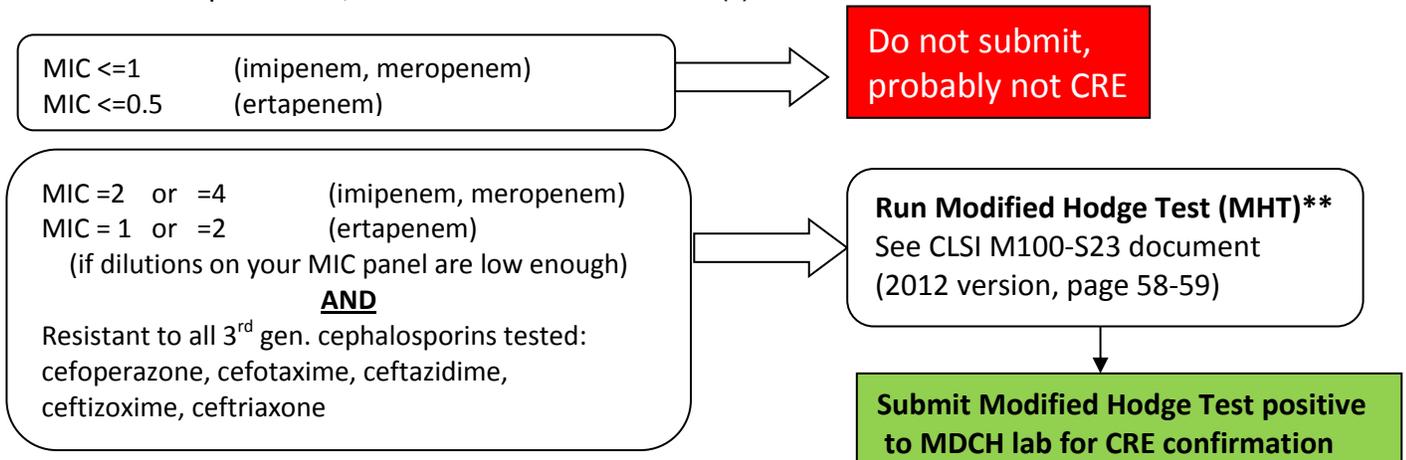
1. Detect possible carbapenem resistance in isolates of *Enterobacteriaceae*, using current recommendations from CLSI to the extent possible. (See below for specific guidance)
2. Send suspect isolates to MDCH laboratory in Lansing for confirmation
(when a particular resistance mechanism is confirmed in your facility, it may not be necessary to send all subsequent isolates)

MDCH:

1. Confirm organism is *Enterobacteriaceae* (Gram stain, identification, pure culture)
2. Perform **MIC** testing for seven (7) antimicrobial agents using the CLSI reference microbroth dilution method, and interpret using newest CLSI breakpoints (2012):
imipenem, meropenem, ertapenem, doripenem (carbapenems), ceftriaxone, ceftazidime, and aztreonam
3. Perform **Modified Hodge Test** (using meropenem disk) if any carbapenem = I or R
4. If isolate is carbapenem I or R, 3rd generation cephalosporin R, Modified Hodge Test positive: perform PCR testing for **KPC gene** (*bla_{KPC}*) and **NDM-1 gene** (*bla_{NDM-1}*)
5. Report to submitter
6. Share results with state Healthcare-Associated Infections (HAI) coordinator (Jennie Finks) and SHARP* Unit in MDCH Bureau of Epidemiology
*Surveillance for Healthcare-Associated and Resistant Pathogens

Criteria for Isolates if laboratory is using “older” (2010) CLSI breakpoints:

1. Look at instrument results for *Enterobacteriaceae* isolates (no *Pseudomonas*, no *Acinetobacter*).
2. If carbapenem I or R, submit to MDCH lab for CRE confirmatory testing
3. If carbapenem = S, look at numerical MIC value(s):



**If your laboratory is not doing the MHT, we encourage you to do so.

Criteria for Isolates if laboratory is using “newer” (2012) CLSI breakpoints:

Send any carbapenem I or R isolates to MDCH (when a particular resistance mechanism is confirmed in your facility, it may not be necessary to send all subsequent isolates)

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What to Submit?

- Pure culture of any species of *Enterobacteriaceae** that fits criteria above

<i>E coli</i>	<i>Serratia</i>
<i>Klebsiella</i>	<i>Proteus</i>
<i>Enterobacter</i>	<i>Providencia</i>
<i>Citrobacter</i>	<i>Morganella</i>
NOT Pseudomonas	NOT Acinetobacter

*Please email or call Marty Boehme if you're not sure: boehmem@michigan.gov 517-335-9654

- Include copy of your instrument (Vitek, Microscan) printout and MHT results

How to Submit?

- Agar *slants* only, no agar plates will be accepted
- Please include copy of your ID and AST results (e.g., printout from automated instrument)
- Also include MHT result, if performed
- Enter "CRE Confirmation" in Other _____ on MDCH requisition (Form DCH0583):

SUBMITTER'S SPECIMEN # - IF APPLICABLE														
DATE COLLECTED	M	M	D	D	Y	Y	Y	Y	Y	Y	Y	TIME COLLECTED	O	O
INDICATE TEST REQUESTED														
(complete specimen source information on back)														
SEROLOGY <input type="checkbox"/> ARBOVIRUS ENCEP PANEL(IgM) <input type="checkbox"/> BRUCELLA SEROLOGY <input type="checkbox"/> FUNGAL SEROLOGY COMPLEMENT FIXATION <input type="checkbox"/> FUNGAL IMMUNODIFFUSION <input type="checkbox"/> FRANCISELLA SEROLOGY <input type="checkbox"/> LEGIONELLA - HA <input type="checkbox"/> LYME DISEASE - EIA Complete # 4 (reverse) <input type="checkbox"/> MEASLES IgG <input type="checkbox"/> MUMPS IgG <input type="checkbox"/> RABIES AB SEROLOGY Complete # 3 (reverse) <input type="checkbox"/> RUBELLA IgG <input type="checkbox"/> TETANUS TOXIN EIA <input type="checkbox"/> VARICELLA ZOSTER IgG § May - October Includes Eastern Equine, California, St. Louis and West Nile. CSF only SERUM STATUS - If Applicable <input type="checkbox"/> Acute <input type="checkbox"/> Convalescent MISCELLANEOUS <input type="checkbox"/> AUTOCLAVE TEST STRIPS <input type="checkbox"/> LEGIONELLA - DFA <input type="checkbox"/> LYME DISEASE IFA (CSF)	SYPHILIS TESTING <input type="checkbox"/> SYPHILIS (USR Test) <input type="checkbox"/> SYPHILIS VDRL - CSF Only <input type="checkbox"/> SYPHILIS DFA Complete # 2 (reverse) <input type="checkbox"/> SYPHILIS FTA - ABS DS* <input type="checkbox"/> SYPHILIS IgM WESTERN BLOT <input type="checkbox"/> SYPHILIS TP-PA* (* Prior Approval Required) HIV TESTING <input type="checkbox"/> HIV AB/AG - Serum <input type="checkbox"/> HIV AB - Oral Mucosal Transudate <input type="checkbox"/> CD4/CD8 (EDTA whole blood) <input type="checkbox"/> HIV-1 VIRAL LOAD (EDTA plasma) <input type="checkbox"/> HIV-1 GENOTYPING (EDTA plasma) HEPATITIS TESTING <input type="checkbox"/> HEPATITIS C SCREEN <input type="checkbox"/> HbAg Complete #1 (reverse) <input type="checkbox"/> HEPATITIS B SURFACE AB (Anti-HBc) <input type="checkbox"/> HEPATITIS A VIRUS (IgM)	MICROBIOLOGY <input type="checkbox"/> AEROBIC ISOLATE ID Complete # 5 (Reverse) <input type="checkbox"/> AFB SUSCEPTIBILITY <input type="checkbox"/> AFB SLIDE/CULTURE-CLINICAL SPECIMEN <input type="checkbox"/> AFB Identification - Isolate ID <input type="checkbox"/> C. trachomatis (Non-culture) ¹ <input type="checkbox"/> E. coli (SLT) TOXIN & SEROLOGY <input type="checkbox"/> ENTERIC BACTERIAL CULTURE <input type="checkbox"/> FOODBORNE ILLNESS - Stool or Food Complete # 6 (Reverse) <input type="checkbox"/> FUNGAL IDENTIFICATION- Isolate ID <input type="checkbox"/> LEGIONELLA CULTURE <input type="checkbox"/> NEISSERIA GONORRHOEAE - Isolation <input type="checkbox"/> NEISSERIA - REFERRED CULTURE <input type="checkbox"/> PARASITOLOGY - BLOOD <input type="checkbox"/> PARASITOLOGY - STOOL <input type="checkbox"/> PARASITOLOGY - WORM <input type="checkbox"/> PERTUSSIS PCR <input type="checkbox"/> Salmonella/Shigella SEROTYPING-Human	VIROLOGY <input type="checkbox"/> ENTEROVIRUS PCR <input type="checkbox"/> INFLUENZA (PCR/Culture) Complete # 7 (Reverse) <input type="checkbox"/> RESPIRATORY PCR PANEL <input type="checkbox"/> VIRAL CULTURE Tests That Require Prior MDCH Approval <input type="checkbox"/> BACTERIAL TYPING - PFGE Complete # 6 (Reverse) <input type="checkbox"/> BOTULISM TOXIN <input type="checkbox"/> MUMPS - PCR <input type="checkbox"/> MEASLES IgM @ CDC <input type="checkbox"/> NOROVIRUS PCR Complete # 6 (Reverse) <input type="checkbox"/> PERTUSSIS CULTURE <input type="checkbox"/> RUBELLA IgM <input type="checkbox"/> SALMONELLA SEROTYPING (Non-Human) <input type="checkbox"/> TOXIC SHOCK TESTING <input type="checkbox"/> Other: CRE Confirmation <input type="checkbox"/> Other: _____											

- Follow regulations for shipping Infectious Substances, category B (UN 3373) and transport to Lansing laboratory (hospital courier, US Mail, or FedEx)

Shipping address:

Michigan Department of Community Health
Bureau of Laboratories
3350 North Martin Luther King Jr. Blvd.
Building 44 Room 155
P.O. Box 30035
Lansing, Michigan 48909