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MHSAL Guidelines for the Prevention and Control of Antimicrobial Resistant Organisms (AROs)

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ARO Working Group

- Involvement in creation of the guidelines:
  - Representative from Diagnostic Services Manitoba (DSM)
  - Provided input on ARO definitions and laboratory detection of AROs
- Areas of expertise/interest:
  - Mechanisms of antimicrobial resistance
  - Antimicrobial susceptibility patterns of common bacterial pathogens
    - Involved in the creation of antibiograms for healthcare centers in Manitoba
  - Laboratory detection of AROs

Definitions

- **Modified Definitions:**
  - ESBL – old definition
    - An enzyme produced by some species of enteric gram negative bacilli. ESBL has the ability to inactivate a wide range of beta-lactam antibiotics including penicillins and cephalosporins.
  - ESBL – new definition
    - An enzyme produced by some species of enteric Gram-negative bacilli. ESBL enzymes have the ability to inactivate a wide range of beta-lactam antibiotics including penicillins and extended-spectrum cephalosporins (e.g., ceftriaxone and/or ceftazidime).

Modification emphasizes that these enzymes confer reduced susceptibility to extended-spectrum/3rd generation cephalosporins

Definitions

- **Modified Definitions:**
  - VISA
    - Vancomycin intermediate *S. aureus* (also referred to as GISA; glycopeptides – intermediate *S. aureus*). These isolates have a vancomycin MIC of 8 – 16 ug/ml.
  - VISA
    - Vancomycin intermediate *S. aureus* (also referred to as GISA: glycopeptide-intermediate *S. aureus*). Intermediate resistance to vancomycin is defined according to CLSI breakpoints. Laboratory testing and interpretation criteria are subject to change. All VISA isolates should be saved and forwarded to Cadham Provincial Laboratory for confirmatory testing.

Breakpoints for classifying *S. aureus* as intermediately susceptible or resistant to vancomycin have changed – the new definition emphasizes use of current laboratory breakpoints (same applies to VRSA)

Definitions

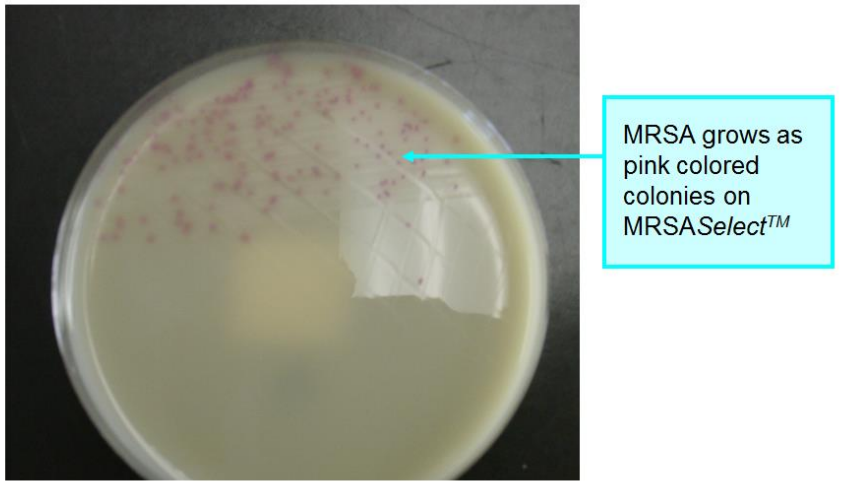
- **New Definitions:**
  - Carbapenem-Resistant Enterobacteriaceae (CRE):
    - Gram-negative bacteria in the family Enterobacteriaceae that demonstrate phenotypic resistance to the carbapenem class of antibiotics (e.g. meropenem, imipenem). Phenotypic resistance to carbapenems may result from the production of a carbapenemase enzyme or from other mechanisms (e.g., permeability changes, efflux, etc.).

Definitions

- **New Definitions:**
  - Carbapenemase-Producing Enterobacteriaceae (CPE):
    - Gram-negative bacteria in the family Enterobacteriaceae that produce a carbapenemase enzyme. Carbapenemase enzymes are beta-lactamases capable of hydrolyzing members of the carbapenem class of antibiotics and most other β-lactam antibiotics. Examples of carbapenemase enzymes of epidemiologic importance include the New-Delhi metallo-beta-lactamase (NDM) and *Klebsiella pneumoniae* carbapenemase (KPC) enzymes. Most CPE isolates demonstrate phenotypic resistance to carbapenems and would therefore also meet the definition of CRE.

Laboratory Detection of AROs

- **MRSA**
  - Surveillance cultures recommended are the same as from the Manitoba Guidelines for the Prevention and Control of Antibiotic Resistant Organisms (AROs), January, 2007
  - Currently, DSM uses chromogenic media for the detection of MRSA



Laboratory Detection of AROs

- **VRE**
  - Clinical isolates will still be identified by routine laboratory practices
  - Screening for asymptomatic VRE colonization is no longer recommended
  - NB. DSM microbiology laboratories will retain the capability to perform screening in the event that the need arises (e.g., transfer of a patient out of province)
    - Discuss with the microbiologist on-call prior to sending
- **ESBL-producers**
  - Clinical isolates will be identified by routine laboratory practices
  - Screening for asymptomatic colonization is not recommended
  - If screening is thought to be necessary, contact the microbiologist on-call

Laboratory Detection of AROs

- **CPE**
  - Carbapenemase-producing Enterobacteriaceae from clinical samples will be identified by usual laboratory practices
  - Routine screening for CPE is not recommended, but screening should be performed for patients admitted to or transferred from facilities within or outside Canada known to have endemic transmission
  - Need to speak with the microbiologist on-call prior to sending a sample to the laboratory

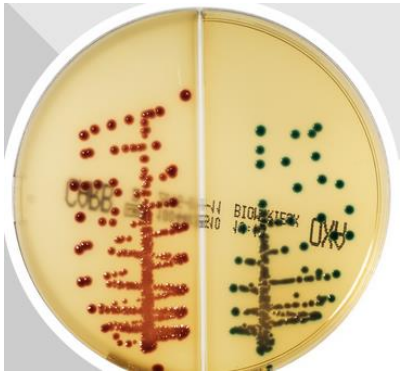
Laboratory Detection of AROs

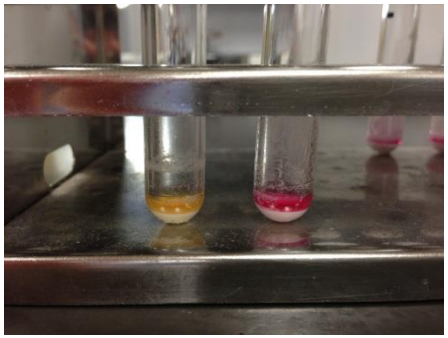
- **Screening for CPE:**
  - Laboratory detection protocol:

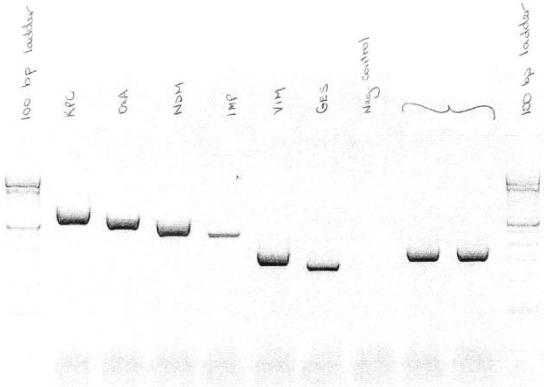
Rectal swab from patient used to inoculate chromogenic media

Colonies morphotypic for Enterobacteriaceae undergo a phenotypic test for carbapenemase production

Isolates positive by the phenotypic test have molecular testing performed







Laboratory Detection of AROs