Important Announcement

August 2019

ACL Laboratories Makes Significant Changes to Susceptibility Testing

Effective immediately, ACL Laboratories, in conjunction with the Advocate Aurora Health Antimicrobial Stewardship Committee, made a series of significant changes to its microbiology susceptibility testing approaches. These changes are the result of routine annual updates from the Clinical Laboratory Sciences Institute (CLSI), updates based on clinical best practice studies, and the merger between Advocate and Aurora antimicrobial formulary and treatment guidelines. The following changes have been made.

- Significant changes in Gram Negative susceptibility reporting on urinary tract isolates
- Significant changes to cefazolin reporting on Gram Negative organisms from all sources
- Reporting of Extended Spectrum Beta Lactamase (ESBL) test on *E. coli* and *K. pneumoniae* from sterile fluid specimens
- Updates to fluoroquinolone breakpoints for *Enterobacteriaceae* and *Pseudomonas aeruginosa*
- Minor general updates in Gram Positive susceptibility reporting

Changes to Gram Negative Susceptibility Reporting on Urinary Tract Isolates

Gram negative susceptibility testing on urinary tract isolates will undergo significant changes to standardize the reporting strategies used by the legacy Advocate and Aurora Systems. Historically, Aurora susceptibility testing was performed with two different susceptibility testing panels while Advocate testing was performed with only one panel. The Aurora approach meant patients got charged double for susceptibility testing and often had susceptibility results that weren't necessary for treating most urinary tract infections (UTIs). Meanwhile even though the Advocate approach was less expensive, it didn't include some antibiotics that are commonly used for treatment of UTIs.

With input from the Advocate and Aurora Antimicrobial Stewardship Committees, ACL will begin performing susceptibility testing on urinary tract isolates using one single panel that contains most antibiotics commonly used for treatment of UTIs. This will allow the legacy Aurora system to decrease the cost of susceptibility testing on gram negative urinary tract isolates by about 50% without losing most of the clinically relevant results they currently see. Meanwhile charges to the legacy Advocate system will remain the same, but they will likely see a greater array of relevant antibiotics for treatment of UTIs.

The drugs on the new panel include: Ampicillin, Amoxicillin/Clavulanic Acid, Ampicillin/Sulbactam, Piperacillin/Tazobactam, Cefazolin, Cefuroxime, Cefoxitin, Cefotaxime, Ceftazidime, Ceftriaxone, Cefepime, Aztreonam, Meropenem, Amikacin, Gentamicin, Ciprofloxacin, Nitrofurantoin, and Trimethoprim/Sulfamethoxazole.

Please note, not every drug is reported on every organism due to intrinsic resistance or for antimicrobial stewardship reasons. The most notable loss will be the removal of tetracycline from the routine gram-negative panel. Testing for tetracycline may still be performed, but additional costs will be incurred, and the result time will take longer. Therefore, ACL requests that this drug ***only*** be requested in situations when it is truly being considered for treatment, not as a routine request.

Changes to Cefazolin Interpretations on *Enterobacteriaceae*

Cefazolin susceptibility testing interpretations for *Enterobacteriaceae* are currently not being reported in accordance with CLSI or FDA guidelines. ACL will update the reporting strategy for this bacteria/antibiotic combination. While this seems like a minor update, it will result in a reporting approach that will likely lead to some confusion because the susceptibility testing panels currently in use by ACL do not have the appropriate antibiotic dilutions to allow for differentiation between susceptible and intermediate isolates. There is no alternative panel that will work on ACL's current testing platform that can change this. Therefore, cefazolin results reported on *Enterobacteriaceae* from all sources will be reported as follows.

Previous Result		New Result		
MIC Value (mcg/mL)	**Interpretation**	**MIC Value (mcg/mL)**	**Interpretation**	**Result Comment**
≤ 4	Susceptible	≤ 4	N/A	A cefazolin MIC result of ≤ 4 cannot be used to differentiate between susceptible and intermediate results. Consider alternative therapy based on clinical response and severity of infection.
8	Intermediate	≥ 8	Resistant	
≥ 16	Resistant			

Please note, no changes will be made to the way *Escherichia coli*, *Klebsiella pneumoniae*, and *Proteus mirabilis* cefazolin susceptibility results are interpreted on urinary tract specimens. These organisms have different susceptibility interpretations when isolated from urinary tract specimens and susceptible isolates can reliably be identified using our current testing methodology.

Reporting of ESBL Result on Sterile Fluids

A recent study (Harris et al., JAMA, 2018, 320(10), 984-94) showed that piperacillin-tazobactam is inferior to carbapenems when treating serious infections due to ceftriaxone resistant *E. coli* and *K. pneumoniae* isolates. To highlight this finding and alert providers to consider using carbapenems when treating serious infections with these organisms, ACL will report the ESBL marker on its susceptibility panel for *E. coli* and *K. pneumoniae* isolates obtained from blood, cerebrospinal fluid, pleural fluid, and pericardial fluid. The ESBL result will appear along with other antibiotic susceptibility testing results and will be reported as "Positive" or "Negative".

ESBL-negative isolates will be reported in a manner that is identical to the current approach. ESBL-positive isolates will have several reporting changes made. First, all beta-lactam and beta-lactam/beta-lactamase inhibitor combination interpretations will be changed to "Resistant" in order to push providers toward the use of a carbapenem. Second, the organism will automatically be flagged as a "Multi-Drug Resistant Organism" (MDRO) and will require that patients be placed in contact isolation. Finally, a comment will append to the ESBL result stating, "This organism is an extended-spectrum beta-lactamase (ESBL) producer and treatment with meropenem is advised. The interpretation of beta-lactam antibiotics that may offer suboptimal treatment have been changed to resistant regardless of their MIC."

Updates to Fluoroquinolone breakpoints for *Enterobacteriaceae* and *Pseudomonas aeruginosa*

CLSI has recently updated the breakpoints for fluoroquinolone antibiotics and *Enterobacteriaceae* and *P. aeruginosa*. ACL will update its reporting criteria to account for this change as identified in the chart below.

Antibiotic	Organism	Timeframe	Susceptible MIC (mcg/mL)	Intermediate MIC (mcg/mL)	Resistant MIC (mcg/mL)
Ciprofloxacin	*Enterobacteriaceae*	Previous Value	≤1	2	≥4
		New Value	≤0.25	0.5	≥1
Levofloxacin	*Enterobacteriaceae*	Previous Value	≤2	4	≥8
		New Value	≤0.5	1	≥2
Ciprofloxacin	*P. aeruginosa*	Previous Value	≤1	2	≥4
		New Value	≤0.5	1	≥2
Levofloxacin	*P. aeruginosa*	Previous Value	≤2	4	≥8
		New Value	≤1	2	≥4

These changes are expected to result in approximately a 10% increase in strains of *Enterobacteriaceae* and *P. aeruginosa* that are reported as resistant to ciprofloxacin and levofloxacin.

Minor Updates to Gram Positive Susceptibility Reporting

Several small changes will be made in the susceptibility testing of Gram-positive organisms in both Illinois and Wisconsin. These changes are made primarily to standardize reporting between the two legacy systems based on the recently combined antibiotic formulary. They are all minor changes likely to go unnoticed by most providers and primarily include suppression of drugs that are no longer routinely used in day to day patient care (e.g. synercid and *Enterococcus*). There haven't been any changes to the actual susceptibility testing panels that are being used in the laboratory. Changes have only been made to the drugs that are routinely released to the patient report. In the event that a drug that was routinely released in the past is no longer visible on a particular patient, providers may call ACL's Microbiology Department to have the result released to the patient chart if the antibiotic is going to be used for patient testing.

Please contact ACL Laboratories Client Services Department at 1.800.877.7016 with any questions regarding this new testing approach.