May 2, 2018

To: Clinical Staff, ZSFG, Clinics and Health Centers

From: Barbara L. Haller, M.D., Ph.D.
Director, Clinical Laboratory, ZSFG and Division Chief, Microbiology

Re: Report on Antimicrobial Susceptibility of Bacteria Isolated from Patients at ZSFG, Clinics and Health Centers January-December 2016

- Copies of the folded card report are enclosed. Extra copies may be obtained by calling 415-206-6786 or by coming to Clinical Laboratory Administration, NH 2M14.

- A PDF file of the antibiogram is also available on-line, on the ZSFG Clinical Lab Manual website. See: http://labmed.ucsf.edu/sfqlab/test/MicrobiologyProcedures.html and click on the link provided for Antimicrobial Susceptibility Studies.

- The percent susceptible value was determined by using the results from the first isolate of a given bacterial species per patient per year. (Exception: multiple isolates per patient were included for vancomycin and ampicillin susceptibility data for Enterococcus spp. For this exception, the total number of patients with resistant organisms is provided.)

- For organisms that have fewer than thirty isolates tested, there is less statistical validity for the percent susceptible value; however, these isolates are reported to indicate the frequency of recovery.

Notable observations for 2016 data:

1. *Staphylococcus aureus*: In 2016, nafcillin resistance for *Staphylococcus aureus* isolates from non-urine sources was 39%, an increase from results in 2015 when 38% were nafcillin resistant. There were no vancomycin-intermediate or resistant *Staphylococcus aureus* isolates recovered in 2016.
2. **Streptococcus pneumoniae**: The percentage of penicillin-susceptible *S. pneumoniae* has remained stable for the past few years. In 2016, 99% of *S. pneumoniae* isolates were penicillin-susceptible (2014 = 99% PCN susceptible, 2015 = 100% PCN susceptible). One isolate was penicillin-intermediate, and no isolates were penicillin-resistant in 2016.

3. **Enterococcus species**: In 2016, the percent of vancomycin-resistant *Enterococcus* isolates was 14%, a decrease from 2015 when 15% were vancomycin-resistant.

![Vancomycin Resistant Enterococci](image)

4. **Extended Spectrum Beta-Lactamas (ESBL)**: *Escherichia coli*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, and *Proteus mirabilis* are routinely screened for ESBL production. In 2016, the percent of bacterial isolates that were ESBL-producers was 10%. Most ESBL-producing organisms are recovered from urine cultures. Out of 2489 isolates tested for ESBL, we recovered 217 *E. coli*, 14 *K. pneumoniae*, 5 *K. oxytoca*, and 2 *P. mirabilis* that were ESBL-producers in 2016.

5. **Inducible Clindamycin Resistance**: When susceptibility testing is performed on *Staphylococcus* spp. or beta-hemolytic Streptococci, clindamycin results are determined by both an MIC method and a test for inducible clindamycin resistance. The presence of inducible clindamycin resistance is indicated in the susceptibility results.

In 2016, the percent of inducible clindamycin resistance detected in methicillin-resistant *Staphylococcus aureus* (MRSA) isolates was 2%, unchanged from 2015. Of the methicillin-susceptible *Staphylococcus aureus* (MSSA) isolates in 2016, 9% expressed inducible clindamycin resistance, unchanged from 2015.

6. **Carbapenem-Resistant Enterobacteriaceae (CRE)**: In 2015, the CDC defined CRE as resistant to imipenem, meropenem, doripenem*, or ertapenem. In the Clinical Lab, Enterobacteriaceae isolates that meet these criteria undergo additional phenotypic testing to identify carbapenemase-producing CRE (CP-CRE), a subset of CRE believed to be the cause of the spread of CRE in the United States. Molecular testing for CP-CRE at a reference laboratory is also available if confirmatory testing is requested.

In 2016, the laboratory identified three isolates that met the CP-CRE definition. Two of the isolates were recovered from one patient's urine sample, a *Citrobacter freundii* complex and a *Klebsiella pneumoniae*, both of which upon molecular testing were positive for the *Klebsiella pneumoniae* carbapenemase (*blaKPC*) gene. The third isolate was an *E. coli* that tested positive for the New Delhi Metallo-beta-lactamase (*blaNDM-1*) gene. This isolate was recovered from a previously known patient who had tested positive for the same gene in 2015.
7. **Ciprofloxacin-Resistant *Shigella sonnei***: In 2016 the laboratory recovered four ciprofloxacin-resistant *Shigella sonnei* isolates, far fewer than in 2015, when the city of San Francisco experienced an outbreak of ciprofloxacin-resistant *Shigella sonnei* infections. As a result, the percent susceptible to ciprofloxacin was 75% in 2016, compared to only 16% in 2015.

8. **Staphylococcus lugdunensis Added to Antiibiogram**: *S. lugdunensis* is a coagulase-negative *Staphylococcus* spp. that has been associated with bacteremia and endocarditis. All coagulase-negative staphylococcus isolates from positive blood cultures and sterile sites are screened for *S. lugdunensis*, and susceptibility results for these isolates are now included in the 2016 antibiogram for non-urine isolates.

9. **Cefazolin susceptibilities on urine isolates**: For cefazolin susceptibilities on urine isolates, the percent susceptible values reflect interpretations that should be used to predict empiric therapy for uncomplicated UTIs due to *E. coli*, *K. pneumoniae*, and *P. mirabilis*. For complicated UTIs, percent susceptibility interpretations will differ. For advice on the therapy of complicated UTIs, please consult the Infectious Diseases Service at 415-443-2847.

References

   *NOTE: Doripenem is not routinely tested at ZSFG.*


*ATTENTION*

The Clinical Laboratory is exploring the option of going completely paperless for the annual antibiogram. This and future antibiograms will be available online as a downloadable PDF at http://labmed.ucsf.edu/sfghlab/test/MicrobiologyProcedures.html. If you would prefer a hardcopy instead, please let us know by emailing wendy.cheung@ucsf.edu by June 30th, 2018. Other feedback is welcome as well. For questions about the antibiogram, please contact the Microbiology Laboratory at 415-206-3577.