



November 17, 2020

To: Clinical Staff, ZSFG, Clinics and Health Centers

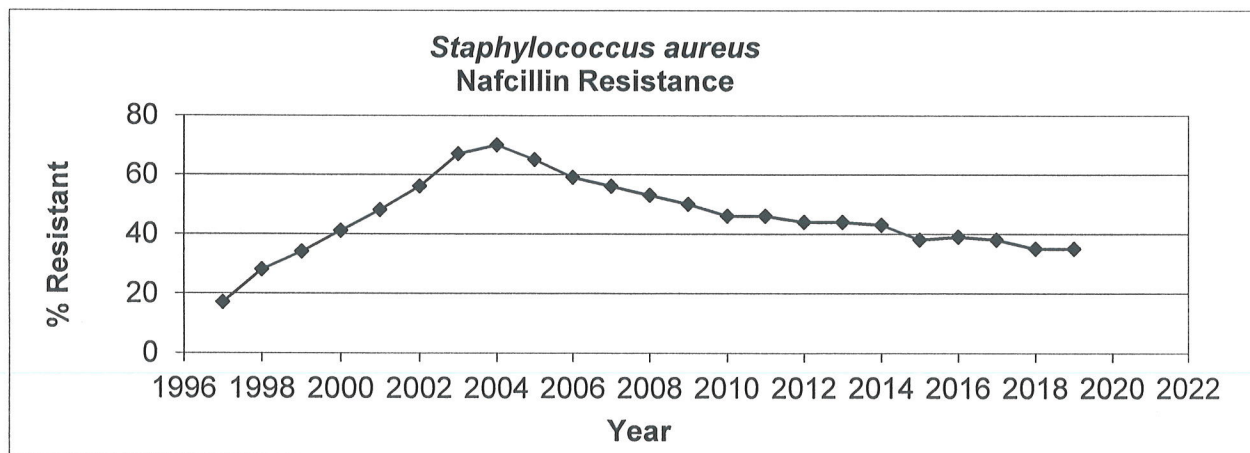
From: Jeff Whitman, MD Chief, Microbiology Division *juw*

Re: **Report on Antimicrobial Susceptibility of Bacteria Isolated from Patients at ZSFG, Clinics and Health Centers January-December 2019**

- Copies of the folded card report are enclosed. Extra copies may be obtained by calling 628-206-6786 or by coming to Clinical Laboratory Administration, NH 2M14.
- A PDF file of the antibiogram is available on-line, on the ZSFG Clinical Lab Manual website. See: <https://www.testmenu.com/zsfqlab/> and click on the link provided for Antibiogram.
- 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.

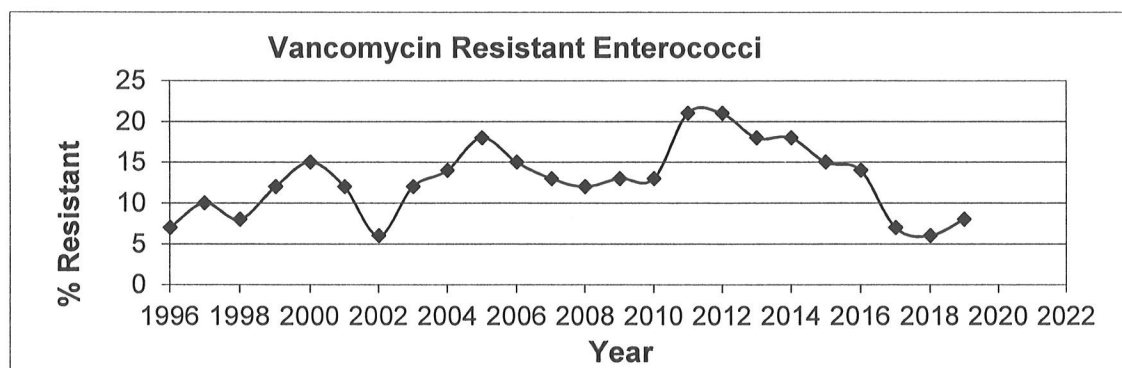
**Notable observations for 2019 data:**

1. ***Staphylococcus aureus*:** In 2019, nafcillin (oxacillin) resistance for *Staphylococcus aureus* isolates from non-urine sources was 35%, unchanged from results in 2018. There were no vancomycin-intermediate or resistant *Staphylococcus aureus* isolate recovered in 2019.



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2. ***Streptococcus pneumoniae*:** The percentage of penicillin-susceptible *S. pneumoniae* has remained stable for the past few years. In 2019, 100% of *S. pneumoniae* isolates were penicillin-susceptible (2018 = 99% PCN susceptible, 2017 = 100% PCN susceptible).
3. ***Enterococcus species*:** The rate of vancomycin-resistant *Enterococcus* isolates in 2019 was 8%, a slight increase from 2018 (6%) and 2017 (7%).



4. **Extended Spectrum Beta-Lactamases (ESBL):** *Escherichia coli*, *Klebsiella pneumoniae*, *Klebsiella oxytoca*, and *Proteus mirabilis* are routinely screened for ESBL production. In 2019, the percent of bacterial isolates that were ESBL-producers was 10%. Most ESBL-producing organisms are recovered from urine cultures. Out of 2814 isolates tested for ESBL, we recovered 255 *E. coli*, 21 *K. pneumoniae*, 0 *K. oxytoca*, and 9 *P. mirabilis* that were ESBL-producers in 2019.
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 2019, the percent of inducible clindamycin resistance detected in methicillin-resistant *Staphylococcus aureus* (MRSA) isolates was 3%, up from 2% in 2018. Of the methicillin-susceptible *Staphylococcus aureus* (MSSA) isolates in 2019, 15% expressed inducible clindamycin resistance, an increase from 12% in 2018.

6. **Carbapenem-Resistant Enterobacteriaceae (CRE):** In 2015, the CDC defined CRE as resistant to imipenem, meropenem, doripenem\*, or ertapenem.<sup>1</sup> In the Clinical Lab, Enterobacteriaceae isolates that meet these criteria undergo additional phenotypic testing, the modified Carbapenem Inactivation Method, 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.<sup>2</sup> Molecular testing for CP-CRE at a reference laboratory is also available if confirmatory testing is requested.

In 2019, the laboratory identified two *Klebsiella pneumoniae* isolates, both recovered from urine specimens that met the CP-CRE definition. Carbapenemase Gene PCR tests were performed, where one isolate tested positive for the *bla<sub>KPC</sub>* gene and the other for the *bla<sub>OXA-48</sub>* gene.

7. ***Staphylococcus lugdunensis* Added to Antibigram:** *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 for non-urine isolates.

8. **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.
9. **Penicillin Susceptibility in *Staphylococcus aureus*:** In October 2016 the Microbiology Laboratory implemented the penicillin zone edge test as it was shown to be more sensitive than nitrocefin-based test for the detection of  $\beta$ -lactamase production in *S. aureus*. All isolates with MICs  $\leq 0.12$ mcg/mL are first tested with a Nitrocefin (Cefinase) disk which if positive, predicts resistance to penicillin, ampicillin, and amoxicillin; if the result is negative, the penicillin zone edge test is performed for isolates recovered from a sterile site. For non-sterile sites, the following comment is appended: "This isolate may be susceptible to penicillin. If clinically indicated, please contact Microbiology Lab at 628-206-8576 to request for further testing." In 2019, twenty *S. aureus* isolates from sterile sites were tested with the penicillin zone edge test and all were susceptible to penicillin.

## References

1. Centers for Disease Control and Prevention (March 1, 2016). Carbapenem-resistant Enterobacteriaceae in Healthcare Settings. Retrieved from <http://www.cdc.gov/hai/organisms/cre>  
\*NOTE: Doripenem is not routinely tested at ZSFG.
2. Centers for Disease Control and Prevention (June 29, 2015). FAQs about Choosing and Implementing a CRE Definition. Retrieved from <https://www.cdc.gov/hai/organisms/cre/definition.html>