December 22, 2016

To: Clinical Staff, ZSFG, Clinics and Health Centers

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Re: Report on Antimicrobial Susceptibility of Bacteria Isolated from Patients at ZSFG, Clinics and Health Centers January-December 2015

- 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/sfghlab/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 2015 data:

1. *Staphylococcus aureus*: In 2015, nafcillin resistance for *Staphylococcus aureus* isolates from non-urine sources was 38%, a decrease from results in 2014 when 43% were nafcillin resistant. There was one vancomycin-intermediate *Staphylococcus aureus* isolate recovered in 2015. No vancomycin-resistant *Staphylococcus aureus* isolates were recovered in 2015.
2. *Streptococcus pneumoniae*: The percentage of penicillin-susceptible *S. pneumoniae* has increased in the past few years. In 2015, 100% of *S. pneumoniae* isolates were penicillin-susceptible (2013 = 97% PCN susceptible, 2014 = 99% PCN susceptible). No isolates were penicillin-intermediate or penicillin-resistant isolates in 2015.

3. *Enterococcus species*: In 2015, the percent of vancomycin-resistant Enterococcus isolates was 15%, a decrease from 2014 when 18% were vancomycin-resistant.
4. **Extended Spectrum Beta-Lactamasases (ESBL):** *Escherichia coli, Klebsiella pneumoniae, Klebsiella oxytoca,* and *Proteus mirabilis* are routinely screened for ESBL production. In 2015, the percent of bacterial isolates that were ESBL-producers was 7%, unchanged from 2014. Most ESBL-producing organisms are recovered from urine cultures. Out of 3,087 isolates tested for ESBL, we recovered 181 *E. coli*, 18 *K. pneumoniae*, and 4 *K. oxytoca* that were ESBL-producers. We did not recover any ESBL-producing *P. mirabilis* in 2015.

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 2015, the percent of inducible clindamycin resistance detected in methicillin-resistant *Staphylococcus aureus* (MRSA) isolates was 2%, unchanged from 2014. Of the methicillin-susceptible *Staphylococcus aureus* (MSSA) isolates in 2015, 9% expressed inducible clindamycin resistance, which is a slight increase from 7% of MSSA isolates in 2014.

6. **Carbapenem-Resistant Enterobacteriaceae (CRE):** In 2015, the CDC defined CRE as resistant to imipenem, meropenem, doripenem (NOTE: Doripenem not routinely tested at ZSFU), or ertapenem. In the ZSFU Clinical Lab, Enterobacteriaceae isolates that meet these criteria undergo additional phenotypic testing for carbapenemase production. Molecular testing at a reference laboratory is also available if confirmatory testing is necessary.

In December 2015, the Laboratory identified one *E. coli* isolate, recovered from a patient with recent travel history to/from Nepal, which met the 2015 CDC screening definition of a CRE. Upon molecular testing, this isolate was positive for the New Delhi Metallo-beta-lactamase (NDM-1) gene. NDM-1 is a type of carbapenemase that initially was seen in Enterobacteriaceae isolates from India and Pakistan, and specifically in New Delhi. However, it has now been found around the world, including the United States, Japan, Australia, and the United Kingdom, especially in patients who spent time or travelled in India.

The laboratory also identified 6 *Enterobacter* isolates that met the CDC CRE definition; however none of these isolates were carbapenemase-producing CRE upon further testing. Carbapenem resistance exhibited by *Enterobacter* species may be associated with the hyperproduction of AmpC beta-lactamase along with porin channel loss.

7. **Ciprofloxacin-Resistant Shigella sonnei:** In San Francisco, between November 2014 and March 2015, there was a city-wide outbreak of ciprofloxacin-resistant *Shigella sonnei* infections. As a result, only 18% of the *S. sonnei* isolates tested in 2014 were ciprofloxacin-susceptible. In 2015, the percent susceptible to ciprofloxacin remained low, at only 16%.

8. **Cefazolin added to Antibiogram:** Cefazolin susceptibilities are now included in the 2015 antibiogram for both urine and non-urine isolates.

**References**