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Background

- Fluoroquinolones are one of the most commonly used antibiotic classes in the United States and have been associated with rare but severe and debilitating side effects¹
- Fluoroquinolone use has been associated with increases in *Clostridium difficile* infections, as well as resistance in *Escherichia coli*, *Pseudomonas aeruginosa* and other gram-negative bacilli^{2,3}
- Fluoroquinolone use has been identified as a risk factor for methicillin-resistant *Staphylococcus aureus* (MRSA) acquisition⁴
- Hospitals have demonstrated that reducing overall use can decrease the rate of MRSA⁵⁻⁷

The purpose of this study is to assess the impact of a non-restrictive fluoroquinolone reduction initiative on institutional antibiotic resistance

Figure 1: Interventions



Methods

- This was a pre- and post-intervention cohort study
- February 2016 to December 2016 and February 2017 to December 2017 were the pre- and post-intervention periods, respectively**
- Antimicrobial use was measured as intravenous Days of Therapy (DOTs) per 1000 patient-days
- Chi square test was used to compare outcomes.

Results

Fluoroquinolone Use
75 vs 40.1 DOTs/1000 pt days in 2016 compared to 2017
Decrease of 34.9 DOTs/1000 pt days (95% CI -37.3 to -32.5, **p<0.001**)

S. aureus susceptibility to oxacillin
47.2% to 55.2%
↑8% (95% CI 1.2 to 14.7, **p = 0.02**)

P. aeruginosa susceptibility to levofloxacin
60% to 70.7%
↑10.7% (95% CI 0.8 to 20.6, **p = 0.03**)

No significant differences in susceptibility rates of *E.coli*, *P. mirabilis*, or *K. pneumoniae* to levofloxacin were detected

Figure 2: Fluoroquinolone Use

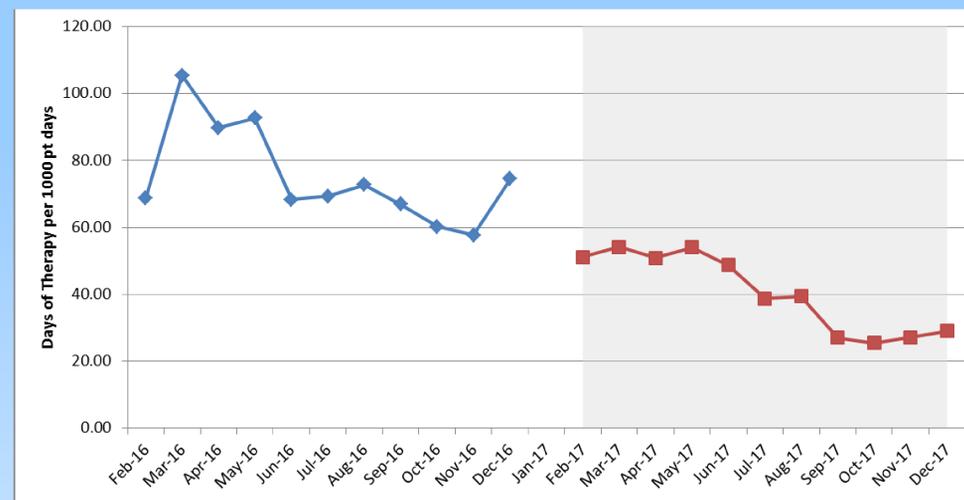
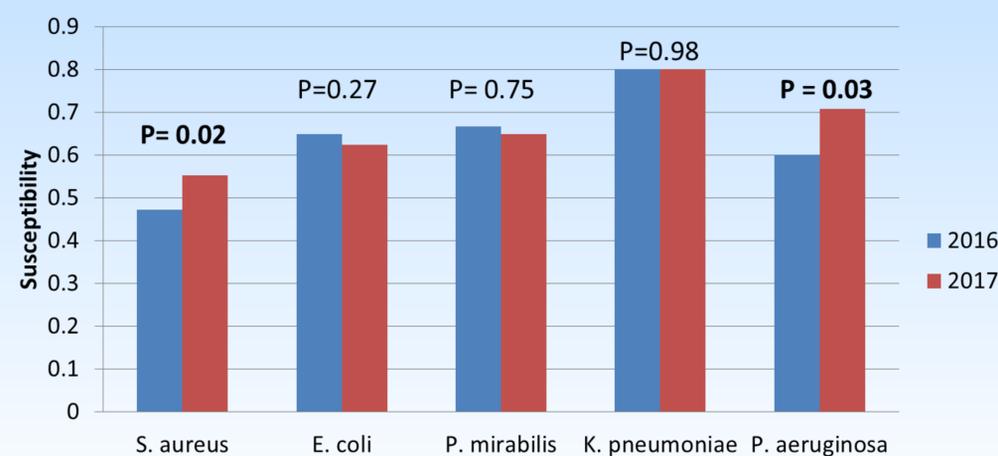


Figure 3: Antibiotic Susceptibilities 2016-2017



Discussion

- 2017 *S. aureus* susceptibility rates to oxacillin at JCMC are the highest they have been in the past 11 years
- Prior studies have used restrictions to limit FQ use and positive antibiotic resistance outcomes were seen
- In settings with less resources, using a non-restricted education and awareness campaign can be a more feasible way to decrease inappropriate antibiotic use**
- Study limitations include measuring inpatient levofloxacin IV therapy only, a variety of factors outside of fluoroquinolone use could have impacted resistance rates, FDA warnings could have contributed to reduced use, education on duration of antibiotic therapy could have also contributed to reduced use

Figure 4: *Staphylococcus aureus* Susceptibility 2007-2017



Conclusion

- A non-restrictive fluoroquinolone reduction initiative led to a significant decrease in fluoroquinolone use. This was associated with decreased antibiotic resistance to *S. aureus* and *P. aeruginosa*.**
- Continued education and awareness are important to promote appropriate use of fluoroquinolones and mitigate associated risks.

References

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