

Evaluation of the usage of fluoroquinolones and the effect of staff education on prescribing patterns in a three-hospital health system

Carrie Chuck, PharmD, BCPS, Courtney Tomaselli, PharmD, BCPS, Juliana Quad, PharmD, Donald Allegra, MD



Saint Clare's Health

Dover Hospital | Denville Hospital | Behavioral Health

BACKGROUND

- Fluoroquinolone antimicrobials have been on the market for many years and are used to treat a multitude of infections.
- Recently, fluoroquinolones have been linked to serious adverse reactions including tendonitis, tendon rupture, CNS effects, hypoglycemia, and peripheral neuropathy.

OBJECTIVE

- The purpose of this review is to establish if staff education has an impact on fluoroquinolone antimicrobial usage.

METHODOLOGY

- This is a retrospective evaluation of levofloxacin and ciprofloxacin usage at Saint Clare's Health Hospitals between January 1, 2014 and June 30, 2019.
- The usage review was performed using the hospital electronic medical record system.
- Usage of these agents was tracked over time to determine the impact of staff education on fluoroquinolone prescribing.
- Data collected included the total number of doses of systemic (intravenous or oral) levofloxacin and ciprofloxacin that were administered during the specified time period.
- During this six-year period, memos were distributed to medical staff members on a periodic basis when new warnings related to the use of fluoroquinolones were released by the FDA
 - Memo #1: August 2018, regarding the risk of significant hypoglycemia
 - Memo #2: October 2018, summarized all recent FDA warnings
 - Memo #3: February 2019, regarding the risk of aortic dissection

RESULTS

Figure 1. Fluoroquinolone Usage by Number of Doses

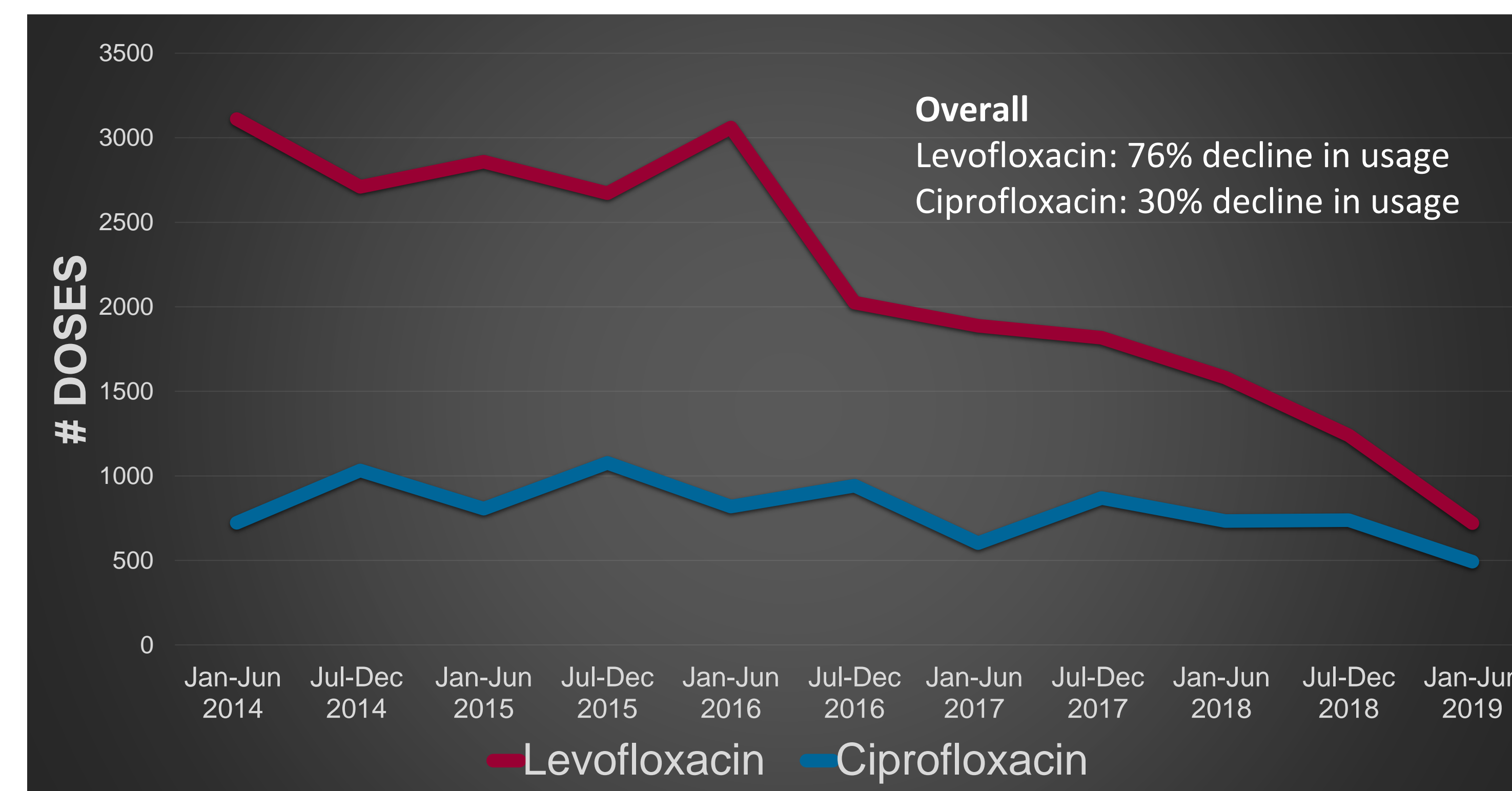


Figure 2. Fluoroquinolone Usage by DPPD (Doses per Patient Days x 1000)

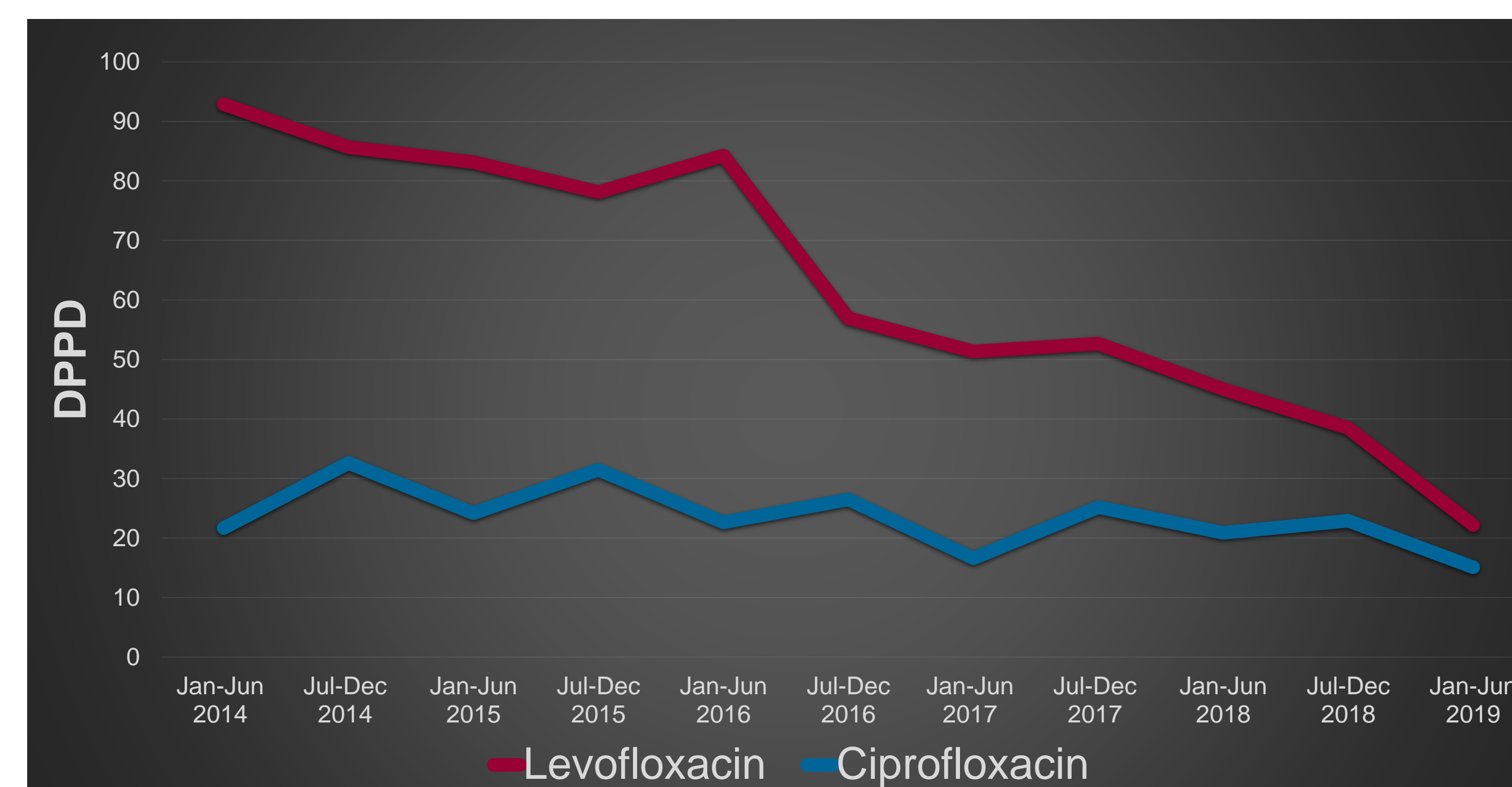


Table 1. Fluoroquinolone Usage Summary

	2014 JAN 1 - JUN 30	2019 JAN 1 - JUN 30
Levofloxacin	92.88 DPPD	22.16 DPPD
Ciprofloxacin	21.68 DPPD	15.1 DPPD

Table 2. Denville and Dover Gram Negative Isolates (% Susceptible)

	Ciprofloxacin	
	2014 JAN 1 - DEC 31	2019 JAN 1 - SEPT 30
<i>Citrobacter freundii</i>	92	100
<i>Enterobacter cloacae</i> Complex	89	92
<i>Escherichia coli</i>	79	73
<i>Escherichia coli</i> ESBL (+)	14	12
<i>Klebsiella pneumoniae</i>	93	90
<i>Klebsiella pneumoniae</i> ESBL (+)	46	53
<i>Klebsiella oxytoca</i>	100	100
<i>Proteus mirabilis</i>	48	69
<i>Pseudomonas aeruginosa</i>	76	83
<i>Serratia marcescens</i>	86	100
<i>Acinetobacter baumannii</i>	-	44

Table 3. Denville and Dover Gram Positive/Anaerobic Isolates (% Susceptible)

	Ciprofloxacin		Levofloxacin	
	2014 JAN 1 - DEC 31	2019 JAN 1 - SEPT 30	2014 JAN 1 - DEC 31	2019 JAN 1 - SEPT 30
<i>Enterococcus faecalis</i>	67	77	67	77
<i>Enterococcus faecium</i>	23	0	27	0
<i>Staphylococcus aureus</i>	83	78	36	79
<i>Staphylococcus aureus</i> MRSA	22	25	22	26
<i>Staphylococcus</i> Coagulase Negative	29	60	58	60
<i>Streptococcus agalactiae</i> (Group B)	-	-	97	98
<i>Streptococcus pneumoniae</i>	-	-	97*	100

*Data from 2012-2014 isolates

CONCLUSION

- Periodic staff education regarding the warnings associated with the use of fluoroquinolones resulted in a significant decline in the usage of these agents at the three Saint Clare's Health Hospitals.
- The decrease in fluoroquinolone usage seen in this review may have led to a significant increase in susceptibility of certain isolates to ciprofloxacin and levofloxacin at Saint Clare's Denville and Dover Hospitals.

DISCLOSURE

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities.