



Unintended Consequences of Fluoroquinolone Stewardship: Impact on Overall Antimicrobial Use Data and Implications for Benchmarking

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BACKGROUND

FOCUSED FLUOROQUINOLONE REDUCTION

- A systemwide antimicrobial stewardship (AS) initiative focused on reduction of fluoroquinolone (FQ) use in targeted diagnosis-related groups (DRGs) was launched in 2016
- Multiple AS strategies were implemented with the goal of reducing overall FQ use and a utilization target of <5% in community-acquired pneumonia (CAP) (see figure 1)
- Rising rates of FQ resistance in addition to Food and Drug Administration (FDA) warnings^{1,2} were key points of education and interventions for prescribers
- In CAP, the change from a FQ to beta-lactam (BL) + atypical agent (combo) was encouraged

LIMITATIONS TO METRICS

- Focused stewardship interventions, particularly class restriction, are not without potential undesirable effects³
- A known limitation of consumption metrics, including antimicrobial days of therapy (DOT), is a perceived benefit associated with single-agent broad spectrum therapy (one DOT) versus multiple, narrow-spectrum agents (≥ 2 DOT)⁴
- However, FQ-sparing combination regimens may provide patient safety and antimicrobial resistance benefits that are not captured by the DOT metric

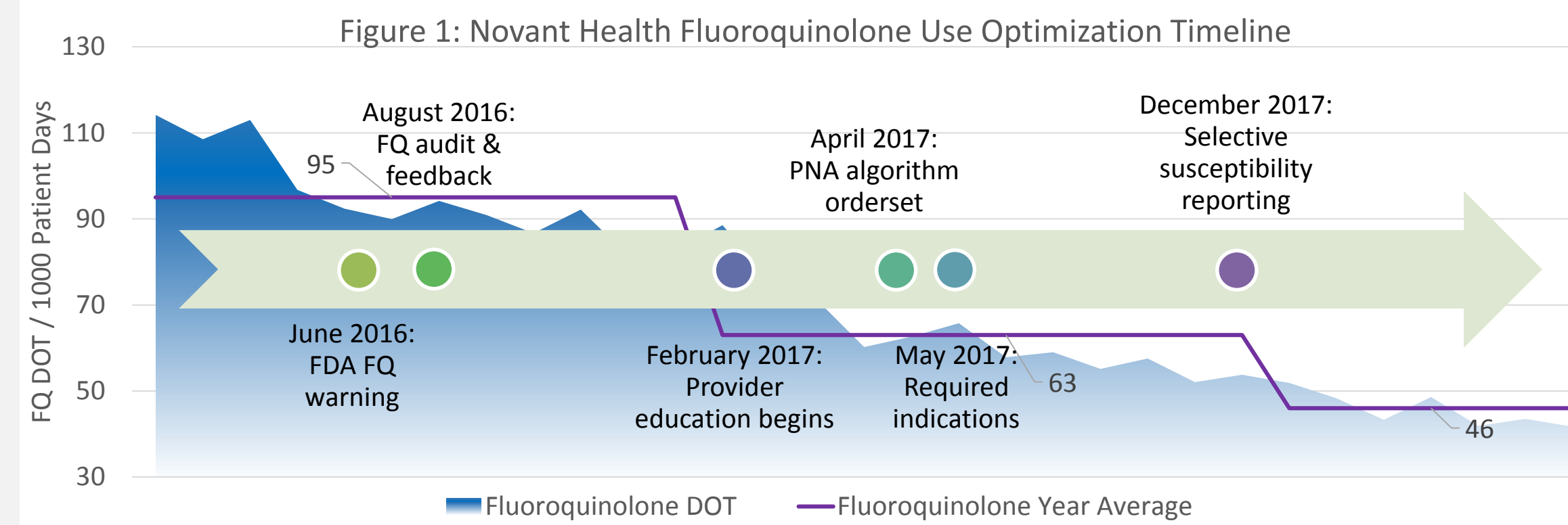
PURPOSE

Evaluate overall and CAP antibiotic utilization before and after a multistep FQ-sparing antimicrobial stewardship initiative.

METHODS

Antimicrobial use was measured utilizing days of therapy (DOT) per 1000 patient days based on administration data from the electronic medical record. Analysis of overall antibiotic DOT usage was calculated and stratified by CAP DRG. DOT data from the period following initiative implementation in 2017 was compared to the same period in 2016 using a one-tail, two-sample t-test assuming unequal variances.

INTERVENTION



RESULTS

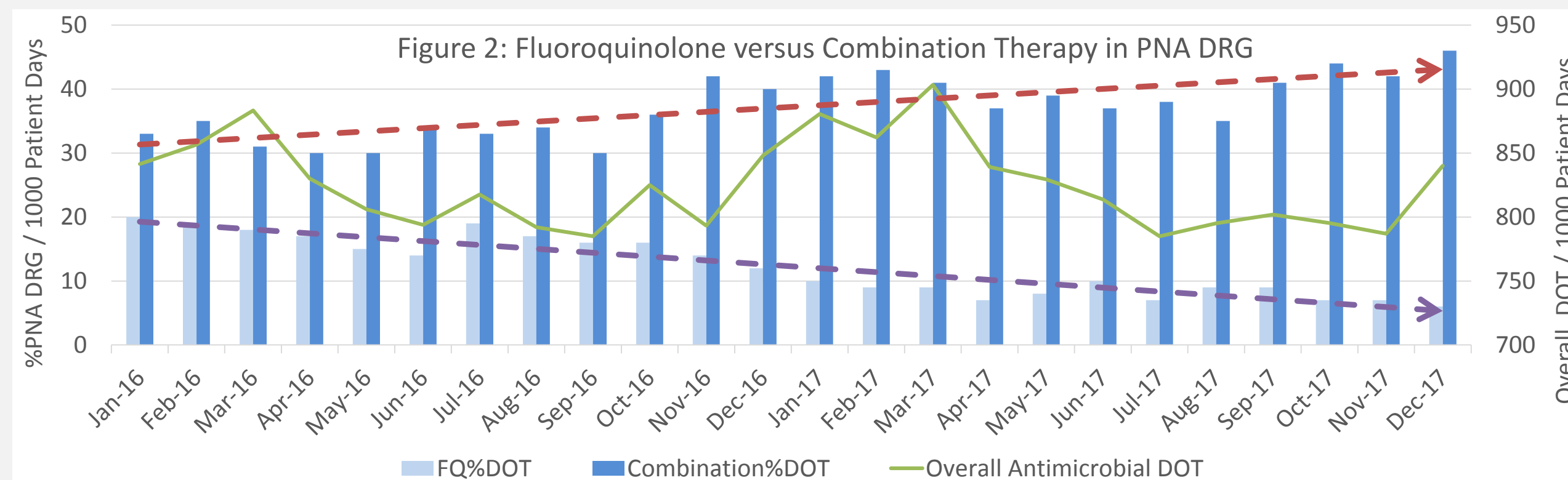


Table 1: Metric Analysis

	2016 mean \pm SD	2017 mean \pm SD	p-value
Overall utilization			
Total abx	827.1 \pm 33.3	826.6 \pm 35.3	0.486
Total FQ	94.7 \pm 10.6	60.3 \pm 10.2	<0.001
Utilization within PNA DRGs			
FQ use	277.9 \pm 69.1	161.2 \pm 26.2	<0.001
Combo use	605.1 \pm 134.9	865.3 \pm 110.3	<0.001
Ceftriaxone	278.4 \pm 64.4	385.6 \pm 61.1	<0.001
Azithromycin	234.4 \pm 51.8	265.8 \pm 59.5	0.165
Doxycycline	92.2 \pm 26.5	213.9 \pm 55.3	<0.001
FQ/Total DOT (%)	5.8	3.2	<0.001
Combo/Total DOT (%)	12.4	17.2	<0.001

SUMMARY

- A drastic 40% overall decrease in FQ utilization was observed as a result of this initiative
- The decrease in FQ utilization was inversely proportional to increases in combo treatment ($p < 0.001$) as well as rise in individual usage of doxycycline ($p < 0.001$)
- Change to combo treatment resulted in greater overall antibiotic DOTs that were likely offset by avoiding and decreasing antibiotic usage outside of CAP and COPD leading to no change between 2016 and 2017
- It remains to be seen the effects of selective susceptibility reports for FQs, as only a short period after was analyzed

CONCLUSIONS

- A multifaceted antimicrobial stewardship initiative to reduce FQ usage resulted in a >50% reduction across a large, healthcare system
- However, a transient increase in overall antimicrobial DOT was observed
- The perceived negative effect on antimicrobial consumption associated with combo therapy may be especially pronounced at small institutions or when assessing unit-specific utilization
- Point prevalence or appropriateness measures could be used as an alternative to or in conjunction with DOT to more accurately capture the full impact of focused antimicrobial class reduction⁴

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Disclosure: Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation.

