Duration of Antimicrobial Therapy: The Impact of Defaults

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Abstract
Background: Default durations imbedded in the electronic prescription (e-script) order entry process may be interpreted by providers as duration recommendations. This process could lead to inappropriately long durations of therapy for antibiotics, especially at hospital discharge when patients have received inpatient antimicrobial.

Methods: Default durations of 7 or 10 days for fluoroquinolones (FQ) were removed from inpatient and outpatient e-scripts from Duke University Health System (DUHS) hospitals (academic, 2 community) and clinics (DUHS) on 12/19/17. We evaluated the impact on FQ duration by comparing mean duration and percent of 10 days in the durations pre-default duration removal (Pre-D) and 3 months post-default duration removal (Post-D) at all inpatient or outpatient encounters with a FQ e-script with days duration less than 31 days were included. FQ durations were captured by inpatient exposure and outpatients from antibiotic scripts. We used descriptive statistics to compare FQ duration pre- and post-DDR using a chi-squared test.

Results: A total of 35,765 FQ e-scripts were removed (DDR) and 276,056 FQ e-scripts/day of therapy were included pre-DDR. The post-DDR included 9,526 FQ e-scripts and 71,028 FQ e-script days of therapy. Mean (standard deviation) durations in the pre and post periods were 7.76 (4.35) and 7.55 (3.93), respectively (p=0.01). Common discharge durations in both time periods across all settings were 7, 10, and 10 days. The 10-day default duration was the most common in the pre-DDR with 11,000 e-scripts (31%), and declined by 10% (2475 e-scripts, 26%) in the post-DDR period. The academic center realized the greatest shift away from 10-day default duration (Table 1). Conclusions: Removal of default e-scripts, a novel and minimally resource intensive strategy, reduced prescribed duration of FQ therapy.

Table 1. Ten-day durations for Fluoroquinolone E-scripts Pre- and Post-DDR

Table 2: Days of Therapy and Mean FQ Duration

<table>
<thead>
<tr>
<th>Practice Setting</th>
<th>FQ Pre-DDR</th>
<th>FQ Post-DDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>AH</td>
<td>5100</td>
<td>3144</td>
</tr>
<tr>
<td>CH1</td>
<td>748</td>
<td>777</td>
</tr>
<tr>
<td>CH2</td>
<td>1664</td>
<td>234</td>
</tr>
</tbody>
</table>

Results
Over 45,000 fluoroquinolone (FQ) e-scripts, accounting for 347,000 days of therapy, were analyzed.

Methods
- Multicenter intervention trial with historic control
- Default EMAR e-script durations of 7 or 10 days for systemic fluoroquinolones (FQ) were removed (DDR) on 12/19/2017
- Pre-DDR: 12/18/16 - 12/18/17
- Post-DDR: 12/20/17 - 3/31/18

Results
- Signification reduction in FQ days of therapy following DDR seen in all settings excluding CH2
- High rate of 10-day durations at AH noted pre-DDR declined substantially in post-DDR period
- A 42% reduction in 10 day duration was realized at AH

Figure 1: AH e-script 10 Day Duration Pre-DDR and post-DDR

Conclusions
- Default information in the EMAR can impact length of antibiotic treatment
- Antibiotic exposure declined as a result of default fluoroquinolone duration field removal and/or intervention to access guidance in e-script
- Over 2,000 fluoroquinolone DOT were avoided in the 3 months following DDR intervention
- Antimicrobial stewardship programs aiming to reduce durations of therapy should also target post-discharge days and investigate defaults in ordering systems.