Digitally Delivering Improvements in Antimicrobial Stewardship

Amy Tse
Deputy Lead Pharmacist for Clinical Informatics

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Introduction

• Oxford University Hospitals NHS Foundation Trust went live with Cerner Millennium in October 2014 with a 6 month phased roll out

• All inpatient areas (with the exception of the Neonatal unit) are live with prescribing and administration
Moving from paper to electronic

- Pharmacists were performing a monthly antimicrobial indication and duration audit.
- Six monthly point prevalence, including whether a PPI is prescribed and if the first dose was given on time.
Antimicrobial prescribing – 1\textsuperscript{st} phase

- Mandatory indication – this is a freetext field.
- The review date is automatically set for T+48 hours.
Once the review date and time has passed, the below alert will fire on open chart:

An antimicrobial is due for review for SMITH, JANE PHARMACY. Please review drug, route and duration. Stop if no longer indicated.
• During auditing, it was found that many prescriptions were not reviewed
• Alternatively doctors were carrying out a clinical review but not altering the review date and time
• Alerts were adding to fatigue and not adding value
CQUIN 2016/2017 Antimicrobial Stewardship

• Reduction in antibiotic consumption per 1000 admissions

• Empiric review of antibiotic prescriptions:
  – Stop
  – Switch
  – Change antibiotics
  – OPAT
Phase 2

• Mandatory duration entry; if greater than 72 hours an alert will fire at the point of prescribing
• Open chart alert 24 hours before and 24 hours after an antibiotic has autocompleted
• Countdown alert at 24, 48 and 60 hours on open chart to highlight that a review is due in 48, 24 and 12 hours time
• Create Antibiotic Review PowerForm
Duration entry

Details for Amoxicillin

- Dose: 500
- Route of Administration: oral
- Frequency: three times a day
- Duration: 
- Dose Unit: mg
- Drug Form: capsule
- Give First Dose Now: Yes
- Duration Unit: 
- Indication: 

Start Date/Time: 04/Dec/17 12:27
Stop Date/Time: 

OK
Warning!

One or more antibiotic prescription(s) for ZZZXTSE, AMYONE will be automatically completed when their course(s) finish within the next 24 hours.

If the prescriptions need to continue beyond that time, please Cancel the current prescription and re-prescribe to prolong the course.

If it is clinically appropriate for the course(s) to complete, you can click on Acknowledge to dismiss future alerts for this patient/antibiotic(s). **NB this will suppress the alert for all users**
Countdown

**Warning**

There are one or more antibiotic(s) due for review within 48 hours.

Please complete an Antibiotic Review form.

If you close this alert to complete the form later, it can be found under the Patient Care tab in Tasks.
Data 2016-2017

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Percentage reviewed within first 72 hours</th>
<th>Number of prescriptions in audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>66%</td>
<td>150</td>
</tr>
<tr>
<td>Q2</td>
<td>80.3%</td>
<td>249</td>
</tr>
<tr>
<td>Q3</td>
<td>90%</td>
<td>291</td>
</tr>
<tr>
<td>Q4</td>
<td>95%</td>
<td>275</td>
</tr>
</tbody>
</table>
Phase 3

• These changes were made in response to feedback from end users

• Less intrusive alerts

• Update Antibiotic Review PowerForm

• Name antibiotics in alert
Less intrusive alerts

[Images of medical alerts and task retrieval completed table]
72 hours after an antibiotic has been prescribed

You must now complete an Antibiotic review form for claRITHromycin and Amoxicillin injection.

If you are not medically responsible for this patient, please click "Review" and select "I am not medically responsible for this patient".
# Antibiotic Review PowerForm

**Antibiotic Review**

- The patient's clinical condition, diagnosis, and investigations (including microbiology) have been reviewed.
- Medically responsible but unable to access patient. Will organise an urgent clinical review.
- I am not medically responsible for this patient.

**Antibiotic Review PowerForm**

- Following review antibiotics can be stopped - This can be done BELOW
- The antibiotic is continuing for a longer duration
- The antibiotic to switch - This can be done BELOW
- The antibiotic is for long-term prophylaxis or suppression in accordance with ID / micro recommendation or OUH Trust guidelines

### Antibiotic Review PowerForm

<table>
<thead>
<tr>
<th>ID / micro recommended</th>
<th>OPAT</th>
<th>OUH Trust guidelines</th>
<th>Other - please justify</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dial infection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Excision of therapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decommission</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Display**

- All Active Medications, All Inactive Medications: 24 Hrs Back

### Active

<table>
<thead>
<tr>
<th>Start</th>
<th>Last Updated</th>
<th>Stop</th>
<th>Order Name/Details</th>
<th>Order Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 Nov 2017 09:12</td>
<td></td>
<td>04 Dec 20 09:12</td>
<td>Amoxicillin 500 mg, oral, three times a day</td>
<td></td>
</tr>
<tr>
<td>28 Nov 2017 10:35</td>
<td>28 Nov 2017 10:35</td>
<td>17:10:50</td>
<td>Rituximab/Cyclophosphamide/Placebo intraven... 125 mL per hr, intravenous</td>
<td></td>
</tr>
<tr>
<td>27 Nov 2017 15:44</td>
<td>27 Nov 2017 15:44</td>
<td></td>
<td>Warfarin See Instructions, oral, once a day, TBC</td>
<td></td>
</tr>
</tbody>
</table>

### Inactive

<table>
<thead>
<tr>
<th>Start</th>
<th>Last Updated</th>
<th>Stop</th>
<th>Order Name/Details</th>
<th>Order Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 Nov 2017 15:26</td>
<td>27 Nov 2017 15:26</td>
<td></td>
<td>Rituximab/Cyclophosphamide/Placebo intraven... 25 mL per hr, intravenous</td>
<td></td>
</tr>
<tr>
<td>27 Nov 2017 15:30</td>
<td>27 Nov 2017 15:30</td>
<td>17:10:50</td>
<td>Rituximab/Cyclophosphamide/Placebo intraven... 50 mL per hr, intravenous</td>
<td></td>
</tr>
</tbody>
</table>

**Reconciliation Status**

- Medis History
- Admission
- Discharge

**Printed 0 minutes ago**

**In Progress**
Name antibiotics in alert

The Gentamicin prescription for ZZZXTSE, AMYONE will be automatically completed when the course finishes within the next 24 hours.

If the prescription need to continue beyond that time, please Cancel the current prescription and re-prescribe to prolong the course.

The Gentamicin prescription for ZZZXTSE, AMYONE has been automatically completed within the previous 24 hours, as it reached the end of its course.

If this was appropriate, please click on Acknowledge to suppress this alert for this patient / antibiotic. **NB this will suppress the alert for all users**
### Issues

- Duration unit: day(s) and dose(s) are next to each other.

<table>
<thead>
<tr>
<th>Details for <strong>Amoxicillin</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dose:</strong> 500</td>
</tr>
<tr>
<td><strong>Route of Administration:</strong> oral</td>
</tr>
<tr>
<td><strong>Frequency:</strong> three times a day</td>
</tr>
<tr>
<td><strong>Duration:</strong></td>
</tr>
<tr>
<td><strong>Special Instructions:</strong></td>
</tr>
<tr>
<td><strong>Start Date/Time:</strong> 04/Dec/17 12:27</td>
</tr>
</tbody>
</table>

- Antibiotics course unintentionally stopping
Future changes?

• Only allow prescribing of three day courses of antibiotics
• Managing restricted antibiotics
• Link prescribing to indication
• Alerts on close chart, rather than open chart
## Live rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHA_MICRO_RV_1V2</td>
<td>Evokes on signing an order for an antimicrobial with a duration set for greater than 3 days / 72 hours. Alert - Review will be required within 72 hours.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_2V2</td>
<td>Evokes on OPENCHART when an antimicrobial has not been reviewed between 24 and 48 hours after prescribing. Allows access to review Form, which contains meds control. Drops a result of &quot;Y&quot; for Antibiotic Review Dismiss.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_3V2</td>
<td>Evokes on OPENCHART for any user when an antimicrobial has not been reviewed for 72 hours. Forces completion of Antibiotic Review Form (Allows for &quot;I'm not medically responsible for this patient&quot;)</td>
</tr>
<tr>
<td>PHA_MICRO_RV_4V2</td>
<td>Completes outstanding task(s) if a review form is completed when launched from an EKM alert.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_5V2</td>
<td>Evokes on CLINICALEVENT when an antimicrobial has not been reviewed between 48 and 60 hours after prescribing. Allows access to review Form, which contains meds control. Drops a result of &quot;Y&quot; for Antibiotic Review Dismiss.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_6V2</td>
<td>If you cancel an antibiotic order, checks that no more antibiotics are prescribed. If they are not it completes Antibiotic review required.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_7V2</td>
<td>Evokes on ORDER EVENT for any user when an antimicrobial has auto-discontinued within the previous 24 hours. Allows Acknowledgement to dismiss further alerts. Drops a result of &quot;Y&quot; for Antibiotic Stop Dismiss.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_8V2</td>
<td>Evokes on OPENCHART when an antimicrobial has not been reviewed between 60 and 72 hours after prescribing. Allows access to review Form, which contains meds control. Drops a result of &quot;Y&quot; for Antibiotic Review Dismiss.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_9V2</td>
<td>If you cancel an antibiotic order, checks that no more antibiotics are prescribed. If they are not it completes Antibiotic review required.</td>
</tr>
<tr>
<td>PHA_MICRO_RV_10V2</td>
<td>Evokes on signing an order for an antimicrobial with a duration unit of &quot;dose(s)&quot;</td>
</tr>
<tr>
<td>PHA_MICRO_RV_11V2</td>
<td>Evokes on OPENCHART when an antimicrobial has not been reviewed between 60 and 72 hours after prescribing. Allows access to review Form, which contains meds control. Drops a result of &quot;Y&quot; for Antibiotic Review Dismiss.</td>
</tr>
</tbody>
</table>
Thank you for listening.

Any questions?