

CASE STUDY

## How to reduce antibiotic course length

Learn how one ICB had an immediate 7.4% drop in antibiotic course length using 'Quantity Limit' switches at the point of prescribing.

This case study describes how ScriptSwitch® Prescribing – Clinical Decision Support is currently helping to sustain the effectiveness of essential antibiotic medications.



**Quantity Limits have been instrumental in helping to deliver on one of the national medicines optimisation opportunities this year."**

**David Ladenheim**

Lead Pharmaceutical Advisor,  
Hertfordshire & West Essex ICB



## THE CHALLENGE

### Variation in the uptake of prescribing short-course antibiotics

The National Institute for Clinical Evidence (NICE)<sup>1</sup> has been advocating a move towards the shortest effective course of antibiotics for appropriate conditions and patients for some time.

However, primary care data indicate considerable variation in the uptake of prescribing short course antibiotics (as seen on OpenPrescribing).



*1 Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use NICE guideline [NG15]. August 2015.*





## THE CHALLENGE

### An NHS national medicines optimisation opportunity

NHS England launched 16 national medicines optimisation opportunities for the NHS to deliver in 2023/24, including reducing course length of antimicrobial prescribing<sup>2</sup>. The practicality of doing this in Primary Care is a challenge due to large variability in prescribing practices<sup>3</sup>.

Translating the recommendations into the prescribing workflow presents an opportunity to integrate the evidence-based guidelines into the decision-making process at the point of care.



*2. National medicines optimisation opportunities 2023/24 NHS England. July 2023.*  
*3. Krockow EM, Harvey EJ, Ashiru-Oredope D. Addressing long-term and repeat antibiotic prescriptions in primary care: considerations for a behavioural approach BMJ Quality and Safety. June 2022.*

## THE SOLUTION

### Quantity Limits – addressing the volume of products being prescribed

Optum® has a 'Quantity Limit' switch feature integrated within ScriptSwitch Prescribing to address the volume of certain products being prescribed.

It offers prescribers a suggested limit to the quantity being issued.

One of the suggestions is for antibiotic course length for treating uncomplicated infections, supporting the NHS England recommendations to sustain the effectiveness of essential antibiotic medications.

NHS Hertfordshire and West Essex ICB (H&W ICB) use ScriptSwitch Prescribing to optimise medicines at the point of prescribing. The solution was procured through NHS Shared Business Services (NHS SBS) Medicines Optimisation Prescribing Decision Support Systems 3 Framework Agreement and is currently used across South and West Hertfordshire, East and North Hertfordshire and West Essex.

For more information on the recommendations, see overleaf.





## THE SOLUTION

### The recommendations: Amoxicillin and doxycycline

The below ScriptSwitch Prescribing QL switches were implemented and displayed to prescribers from June 2023 (West Essex) and August 2023 (SW Herts & EN Herts).

- **ScriptSwitch Prescribing recommendation:** Limit the course length of amoxicillin in line with NICE guidelines
- **Original product:** Amoxicillin 500mg capsules (quantity over 15)  
– usual dose is 1 x three times a day for 7 days (e.g. 21 in total)
- **Replacement product:** Amoxicillin 500mg capsules – NICE guidelines suggest a short-course length for appropriate conditions of 5 days (e.g. 15 in total)

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- **ScriptSwitch Prescribing recommendation:** Limit the course length of doxycycline in line with NICE guidelines
  - **Original product:** Doxycycline 100mg capsules (quantity over 6)  
– usual dose is 1 x twice a day for 7 days (e.g. 14 in total)
  - **Replacement product:** Doxycycline 100mg capsules – NICE guidelines suggest a short-course length for appropriate conditions of 2 capsules on the first day, then 1 capsule a day for 4 days (e.g. 6 in total)

## THE RESULT

### Statistical analysis

Prescription volume data for amoxicillin and doxycycline from NHS Hertfordshire and West Essex ICB was obtained from OpenPrescribing.

The outcome measure for this study was the proportion of prescriptions that breached these limits before and after deployment of the intervention.

The Optum Data Science Unit (DSU) used interrupted time series (ITS) autoregressive integrated moving average (ARIMA) modelling to measure the step change and slope of proportion of limit breaching prescriptions post intervention (Quantity Limits switch). Step change indicates the immediate effect of the intervention and slope indicates the month-by-month change following intervention.



The impact that Quantity Limits have had on reducing course length for amoxicillin and doxycycline has been instrumental in helping to deliver on one of the national medicines optimisation opportunities this year and further contribute to antimicrobial stewardship in our ICB.”

**David Ladenheim**

Lead Pharmaceutical Advisor.  
Hertfordshire & West Essex ICB.

[Click here](#) to download the full case study

## THE RESULT

Making an impact, more than what we would expect without an intervention.

The results spotlight South and West Hertfordshire which made the biggest impact on prescribing data for amoxicillin and doxycycline across the ICB.

Following the implementation of the intervention from ScriptSwitch Prescribing, (Quantity Limits on-screen prompt), the volume of antibiotic prescriptions dramatically reduced, more than what we would expect if the intervention hadn't been implemented.

This is supported by statistical modelling, which indicated the intervention led to an immediate 7.4% drop in the proportion of limit-breaching prescriptions for amoxicillin and an 8.8% drop for doxycycline. A further 2% drop for every month thereafter for amoxicillin and 1.1% drop for every month thereafter for doxycycline has also been seen when following the data post-intervention (including the first full month with the intervention deployed).

## SUMMARY

- **Amoxicillin:**
  - 7.4% reduction in prescribing course length.
  - 2.0% reduction every month thereafter.
- **Doxycycline:**
  - 8.8% reduction in prescribing course length.
  - 1.1% reduction every month thereafter.



ScriptSwitch Prescribing is currently helping to sustain the effectiveness of essential antibiotic medications.”

**Dr David Alexander Dickie**

Director Data Science.

Optum.

[Click here](#) for a case study on semaglutide QL

## THE RESULT

### Further analysis

To substantiate these claims and show generalisability, a further 4 ICBs formed part of the analysis. They implemented the same Quantity Limits switch across their estate and the post intervention drop was analysed.

There were statistically significant decreases in limit breaching antibiotic prescriptions in three out of four ICBs and in all ICBs with at least four months' worth of prescribing data post deployment of the feature.



Using this type of switch for reduced course length of antibiotics contributes towards the UK AMR national goals, as well as reducing waste and other environmental factors."

**Megan Clarke**

Clinical Pharmacist Account Manager.  
Optum.

## SUMMARY

- Quantity Limits has led to a statistically significant reduction in proportion of limit-breaching prescriptions for commonly prescribed antibiotics in multiple, independent ICB settings through England.



Quantity Limits in ScriptSwitch Prescribing was first launched in October 2021. Since then, together we have helped save an additional £5 million for the NHS."

**Christina Weir**

Senior Product Manager.  
Optum.

[Click here for more information on ScriptSwitch](#)



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ScriptSwitch Prescribing - Clinical Decision Support  
is a Class I Medical Device (EU MDD 93/42/EEC)  
(UK MDR 2002)

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