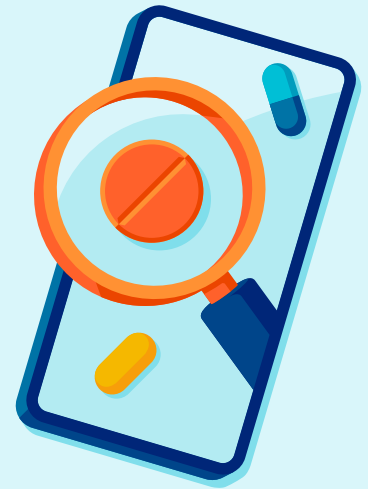


## Case study

# How to reduce antibiotic course length

Learn how one ICB had an immediate 7.4% drop in antibiotic course length using an on-screen prompt at the point of prescribing – with a further 2% drop every month thereafter.



On-screen prompts at the point of prescribing help steer prescribers towards choices that uphold the highest standards of patient care and medication safety<sup>1</sup>. This is particularly important when considering the variation in adherence to prescribing short course antibiotics.

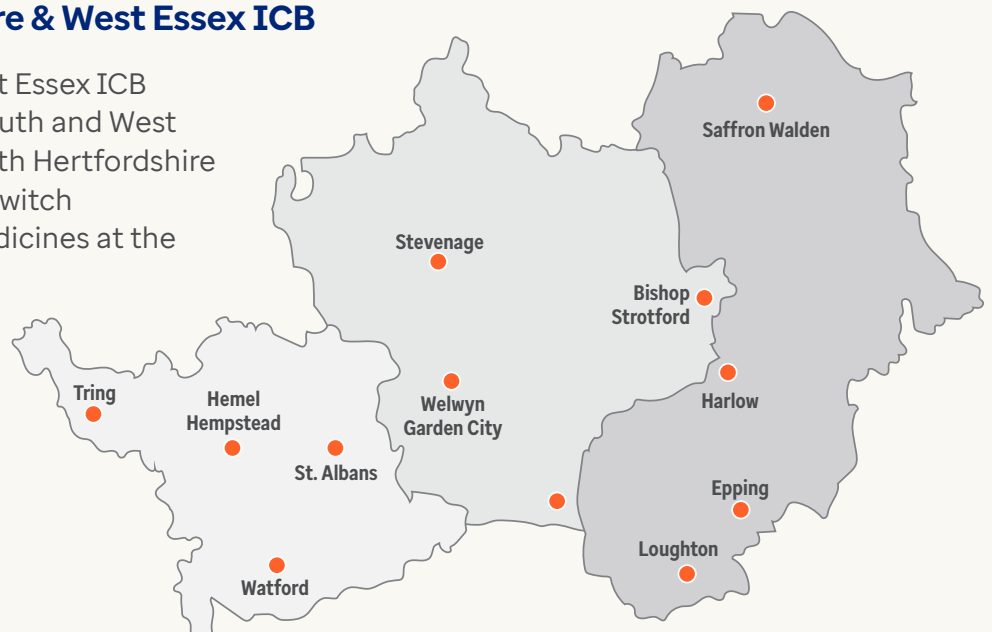
This case study describes how ScriptSwitch® Prescribing – Clinical Decision Support is currently helping to sustain the effectiveness of essential antibiotic medications.

**“ 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

## Meet NHS Hertfordshire & West Essex ICB

NHS Hertfordshire and West Essex ICB (H&WE ICB), made up of South and West Hertfordshire, East and North Hertfordshire and West Essex, use ScriptSwitch Prescribing to optimise medicines at the point of prescribing.



## The challenge

The National Institute for Clinical Evidence (NICE)<sup>2</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](#)).

NHS England launched 16 national medicines optimisation opportunities for the NHS to deliver in 2023/24, including reducing course length of antimicrobial prescribing<sup>3</sup>. The practicality of doing this in Primary Care is a challenge due to large variability in prescribing practices<sup>4</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.

## The solution

Optum has a solution integrated within ScriptSwitch Prescribing (a feature known as Quantity Limits) 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.

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

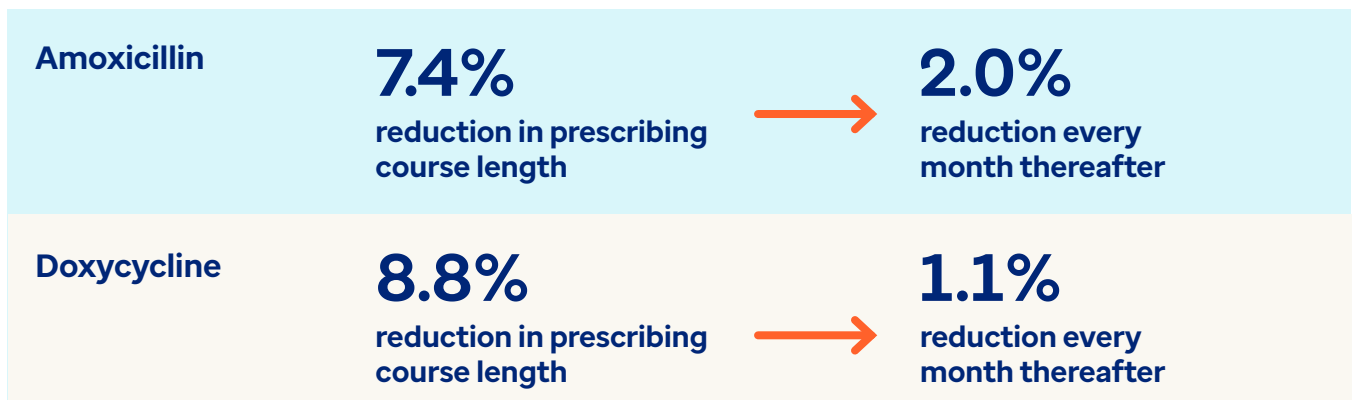
ScriptSwitch recommendation	Original product	Replacement product
Limit the course length of Amoxicillin in line with NICE guidelines	Amoxicillin 500mg capsules <b>(Quantity over 15)</b> <i>Usual dose is 1 x three times a day for 7 days (21 in total)</i>	Amoxicillin 500mg capsules <i>NICE guidelines suggest restricting down to a course length of 5 days (15 capsules)</i>
Limit the course length of Doxycycline in line with NICE guidelines	Doxycycline 100mg capsules <b>(Quantity over 6)</b> <i>Usual dose is 1 x twice a day for 7 days (14 in total)</i>	Doxycycline 100mg capsules <i>NICE guidelines suggests 2 capsules on the 1st day then 1 capsule a day for 4 days (6 capsules)</i>

## The 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.

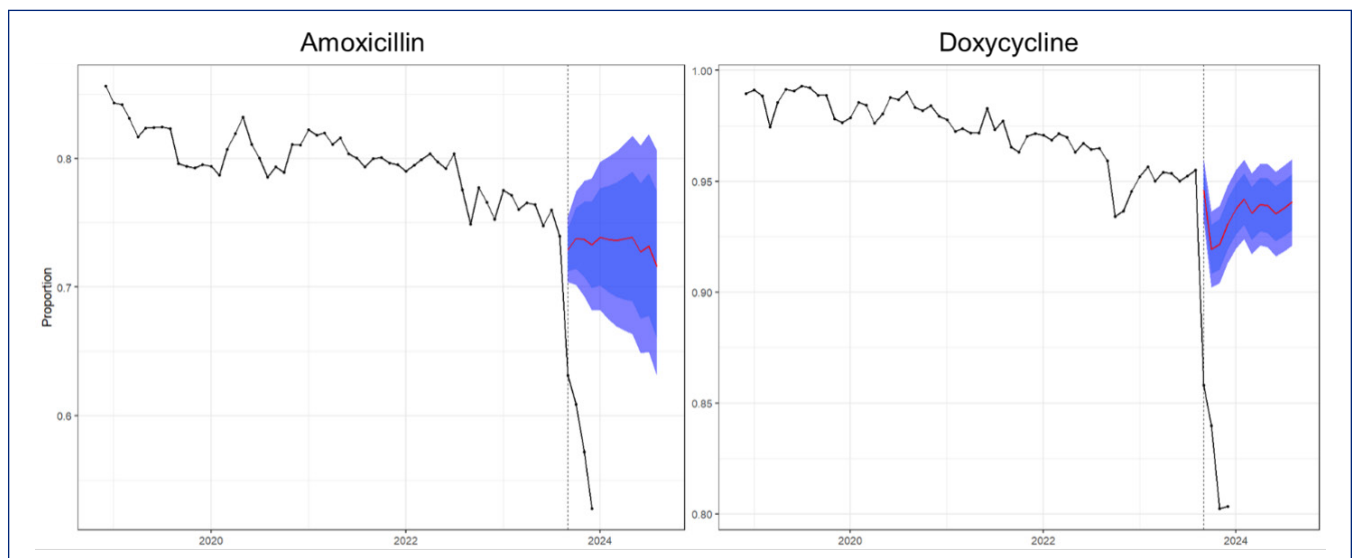
# The results

## Headline results



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

The graphs below show that following the implementation of the intervention from ScriptSwitch Prescribing, (Quantity Limits on-screen prompt - dotted line), the volume of antibiotic prescriptions (indicated by the black lines) dramatically reduced, more than what we would expect if the intervention hadn't been implemented (red lines and blue shaded areas).



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).

“ 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

## 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.

## Benefits

### Benefits of using Quantity Limits for reduced course length of antibiotics<sup>5</sup>



Helps reduce risk of adverse drug reactions



Helps stop inappropriately self-treating in the future



Contributes to a reduction in environmental bacteria



Supports reduced waste in other areas



Contributes towards UK AMR National goals

## Conclusion

The ScriptSwitch Prescribing Quantity Limits switch has led to a statistically significant reduction in proportions of limit-breaching prescriptions for amoxicillin and doxycycline in multiple, independent ICB settings throughout England.

These results show that ScriptSwitch Prescribing is currently helping to sustain the effectiveness of essential antibiotic medications.

### References:

- [Data feedback and behavioural change intervention to improve primary care prescribing safety \(EFIPPS\): multicentre, three arm, cluster randomised controlled trial](#) BMJ. August 2016. and [What Evidence Supports the Use of Computerized Alerts and Prompts to Improve Clinicians' Prescribing Behavior?](#) National Library of Medicine. July-August 2009.
- [Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use](#) NICE guideline [NG15]. August 2015.
- [National medicines optimisation opportunities 2023/24](#) NHS England. July 2023.
- 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.
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Optum Health Solutions (UK) Ltd  
5 Merchant Square, Paddington,  
London, United Kingdom, W2 1AS



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



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