

# The impact of a behavioural intervention on rates of inappropriate antibiotic prescribing – a pilot study in progress.

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## Background

Inappropriate antibiotic use leads to increased drug resistance, longer hospital stays and preventable morbidity and mortality, highlighting the need for an overall reduction in inappropriate antibiotic use. The UK has among the highest levels of antibiotic prescribing in Europe, with twice as much antibiotic prescribing as the Netherlands<sup>1</sup>.

Acute respiratory tract infections are the single most common reason for antibiotic prescription in adults in the acute setting<sup>1</sup>, despite compelling evidence to suggest that antibiotic therapy is ineffective<sup>2,3</sup>. In a UK national survey, up to 28% of clinicians in primary care reported prescribing antibiotics when uncertain of their necessity<sup>4</sup>, with similar figures in secondary care<sup>5</sup>.

The authors hypothesise that overdiagnosis of uncomplicated lower respiratory tract infections (LRTI) as “sepsis” is a significant problem leading to inappropriate parenteral antibiotic administration. To address this, we designed a behavioural intervention and assessed the impact on rates of inappropriate antibiotic prescribing in a secondary care provider.

New definitions of sepsis and septic shock have been published earlier this year by the European Society of Intensive Care Medicine and Society of Critical Care Medicine Third International Consensus Task Force<sup>4</sup>. Their definitions of sepsis culminated in the quick Sequential Organ Failure Assessment (qSOFA) score which defined a qSOFA score of  $\geq 2$  as accurately predictive of true sepsis (see criteria in Figure 1).

The validity of qSOFA is yet to be fully established and adopted into clinical practice<sup>7</sup>. Our project assessed what proportion of patients diagnosed as “septic” met the previous SIRS criteria as well as current qSOFA definitions.

Here we present the preliminary results from our pilot study.

## Aims

This pilot study aimed to address three questions in the acute secondary care setting:

1. What proportion of patients are inappropriately diagnosed with “sepsis”?
1. What proportion of patients started on parenteral antibiotics have sufficient clinical evidence to justify such therapy?
1. What impact does our behavioural intervention have on inappropriate prescribing?

## Method

### Setting

Darent Valley Hospital is a 400-bed district general hospital in Dartford, England. The patients enrolled in the study were an adult, predominantly elderly, population, enrolled on the basis of having received a diagnosis of “chest sepsis”, “LRTI” or “community-acquired pneumonia”, in addition to having been prescribed parenteral antibiotics. We excluded patients with underlying pulmonary pathology (e.g. lung cancer) and immunocompromised patients.

Figure 1. Our behavioural intervention

### Intervention

We wanted a simple, cost-effective and easily distributable intervention and designed a sticker intended for the use of medical patients admitted to the Acute Medical Unit (AMU). The intervention was implemented and enforced with the help of Clinical Navigators.

### Data collection

30 patients matched the eligibility criteria in the baseline audit, with 10 patients to date in the post-intervention stage. The parameters measured were laboratory, radiological and clinical criteria according to both SIRS and qSOFA markers of sepsis.

### Analysis

Rates of inappropriate diagnoses of sepsis were compared in baseline and post-intervention patients. The effect of the behavioural intervention on rates of inappropriate prescribing was assessed

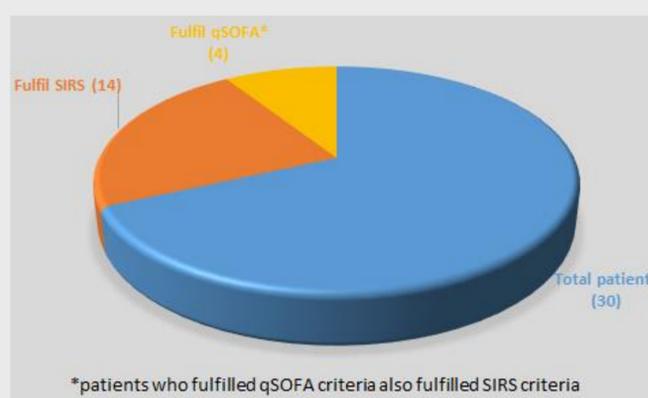


Figure 2: Pre-intervention prevalence of sepsis among patients given parenteral antibiotics.

## Results

### Pre-intervention

Out of the 30 patients enrolled in the baseline audit, only 13% (4) had sepsis according to the new definitions and 47% (14) fulfilled the old SIRS criteria (Figure 2). None of the patients received an initial trial with oral antibiotics or alternatives.

### Post-intervention

Currently, ten patients have been enrolled in the post-intervention study, so far 40% (4) fulfil the qSOFA criteria and 60% (6) fulfil the SIRS criteria, all of which were initially treated with parenteral antibiotics with no transition to oral alternatives post-intervention.

## Discussion

An effective strategy must focus on individual clinicians in the care setting and address the social, organisational and individual barriers to appropriate prescribing.

The implementation of a behavioural intervention is perceived differently by different clinicians and its success relies on the target population being open to such an intervention. Our behavioural intervention aimed at **highlighting new sepsis guidelines, stimulating positive attitudes and minimising patient or peer pressure to prescribe antibiotics.**

Limited conclusions can be drawn from our study as it is in the preliminary phase. The results so far suggest a possible improvement in diagnostic accuracy of sepsis and thus lower rates of inappropriate prescribing. Notably, none of the patients started on parenteral antibiotics in the post-intervention study were switched to oral or other alternatives, despite not meeting the sepsis criteria. The causes for this is likely multifactorial, including social norms, a reluctance to change entrenched practices and the consideration of criteria not included in the existing definitions.

Efforts were made to collect as much relevant clinical data from documentation, but it should be emphasised that this cannot replace clinical judgement and discretion in assessing patients individually. Furthermore, the study did not measure health outcomes or assess whether the reduction in antibiotic prescribing occurred only for infections for which antibiotics are ineffective. Measuring such outcomes would help ascertain more specifically the effects of a behavioural intervention on patient morbidity and health care costs.

## Conclusions

The preliminary results from our pilot study support the notion that a behavioural intervention could be a simple and cost-effective means of changing prescribing practices and optimising antibiotic use in the hospital setting.

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