

Supporting Correct Antimicrobial Choices in Sepsis [†]

Balwinder Bolla ^{1,*} and Alex Rond-Alliston ²¹ Department of Pharmacy, United Lincolnshire Hospitals, Lincoln LN25QY, UK² East Cheshire NHS Trust, Macclesfield SK10 3BL, UK

* Correspondence: balwinder.bolla@ulh.nhs.uk; Tel.: +44-01522-573735

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Abstract: Antimicrobial audits on A&E and acute admissions wards have highlighted deficiencies in prescribing practices, particularly the inappropriate use of broad-spectrum agents. A clinical decision-making tool was created to expedite and facilitate the process of selecting correct antimicrobial treatments based on the site and severity of an infection, and also included the consideration of penicillin allergy. Simple, efficient, and effective, this tool has already been shared with many NHS Trusts nationally. Further audits, after this tool was introduced, show improvements in some aspects of antimicrobial prescribing, despite limited opportunities to deliver an awareness campaign of this resource. Such action will be needed to drive further improvements in antimicrobial prescribing choices in sepsis.

Keywords: antibiotic; antimicrobial; stewardship; prescriptions; clinical decision tool; broad-spectrum antibiotics; sepsis; allergy

1. Project Overview

Several reasons to improve the awareness of correct antimicrobial choices in sepsis have been highlighted in our Trust. These range from mortality risk and significant side effects to more widespread inappropriate escalations of antibiotics or inadequate cover provided by choices.

Antibiotic stewardship is vital to try to limit the growth of antimicrobial resistance, which has been described as one of the WHO's top ten global public health threats [1] and is responsible for more than 50,000 bloodstream infections each year in the UK, with considerable associated mortality [2].

Antimicrobial audits undertaken in our A&E department and on acute surgical wards have revealed the inappropriate use of broad-spectrum antibiotics, particularly piperacillin-tazobactam and meropenem. Two key issues were highlighted by root cause analyses:

1. Incorrect labeling of localized infectious disease as sepsis.
2. Perception of poor differentiation of treatment choices in current guidelines, even where there is a clear suspected cause.

The existing antimicrobial guidance and posters were felt to be unclear and difficult to read due to the volume of information.

The purpose of creating a new clinical decision-making tool was to improve both the access and clarity of Trusts' antimicrobial recommendations in sepsis, sources known and unknown, that can be referred to swiftly at the point of prescribing. These recommendations need to be clear, concise, and easily used in daily practice.

This tool (Figure S2) simplifies the choice of antimicrobials required by way of a few simple questions, with clarification and further information if required by a user. It easily can, and has, been updated to reflect changes to guidelines, ensuring that it remains relevant to local antimicrobial trends.



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2. Outcomes and Impact

The tool has seen widespread use since its creation and adoption (Figure S3). Its use has increased with time, with the greatest use being seen during the junior doctor turnover month of August, helping new prescribers to familiarize themselves with local guidelines. It has received positive feedback from staff, particularly regarding its ease of use, accessibility, and educational value, enabling rapid decisions and bolstering confidence in these decisions. Due to widespread interest, this tool has been shared with over a dozen hospitals and NHS Trusts in the UK (Figure S4).

A comparison of antimicrobial audit data has been undertaken for A&E in terms of the quality of prescribing prior to and after the introduction of this clinical decision tool (Table S1). Improvements in antimicrobial prescription practices in regard to the clarity of a site and the severity of an infection are notable. This may be attributed, in part, to the additional information provided in the tool. There was no indication of an improvement in the correct choice of antimicrobials at this point; however, the audits did not focus on sepsis presentation alone, as they were undertaken for multiple reasons. It is also important to state that the awareness campaign for this tool has not been optimized as of yet. Educational sessions, written communications, and walk-arounds have helped raise awareness, but in areas with high levels of agency and locum staffing more is needed to embed the message.

3. Future Development

Plans for this tool include increasing awareness with larger and timely educational campaigns, collating further feedback for the improvement of the next version, and views on how to maximize accessibility as well as convenience. Other work will include developing a bitesize educational video to accompany this tool and updating guidelines and posters with a direct QR code (Figure S2). Further surveillance of utilization and comparing audits will also be helpful in establishing how these efforts are progressing improvements in practice.

Supplementary Materials: The following supporting information can be downloaded at: <https://www.mdpi.com/article/10.3390/msf2022015005/s1>, Figure S1: Poster overview of the project; Figure S2: Screenshot of the tool itself, as viewed by a user. Note also the QR code in the bottom-right-hand corner to view the current version directly; Figure S3: Graph depicting the use of the tool in 2022 so far. Updated since poster submission for accuracy; Figure S4: List of hospitals and NHS Trusts that the tool has been shared with; Table S1: Overview of pre- and post-intervention audit data.

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