

Sepsis Clinical Care Standard

IMPLEMENTATION CASE STUDY

Embedding Antimicrobial Stewardship in sepsis care

The Alfred Hospital, VIC

Sepsis is a life-threatening condition which benefits from early treatment with antibiotics. However, the need for rapid early antibiotic treatment in sepsis must be balanced with the potential for inappropriate antimicrobial use. Hospital-based Antimicrobial Stewardship (AMS) systems can play a key role in ensuring appropriate and effective use.

Senior Infectious Diseases Pharmacist at The Alfred Hospital, Zohal Rashidzada, was well aware of the difference that timely and appropriate antimicrobial therapy makes for patients with sepsis. The Alfred had implemented interventions to ensure rapid treatment within 60 minutes for patients identified with sepsis, including a 'Sepsis Call-Out' paging system in the Emergency Department (ED) and mandatory sepsis protocols on all Medical Emergency Team (MET) calls. These interventions reduced average time to antimicrobial therapy from 110 to 55 minutes in ED patients with sepsis who subsequently required care in the Intensive Care Unit. However, while the hospital had an active AMS program, the appropriateness of antimicrobials prescribed for sepsis during a MET call was not consistently being assessed.

In 2018, working under the governance of The Alfred's Sepsis Working Group, Zohal undertook an audit of the hospital's performance in relation to antimicrobial treatment for sepsis cases. She then conducted a randomised controlled trial to assess the impact of AMS reviews for patients who had a MET call for suspected sepsis.

Her work led to the implementation of routine AMS intervention in all MET calls for sepsis and the establishment of a combined AMS and Sepsis pharmacist role. The proportion of patients receiving appropriate antimicrobial therapy for sepsis after a MET call increased significantly by 23%.

What changes were made?

Zohal's contributions support a larger body of work, underway at The Alfred since 2015, focussed on improving the way clinical teams respond to sepsis. Changes include:



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Having routine AMS review for patients with sepsis resulted in significant improvements. Firstly, there was an improvement in the appropriateness of the antibiotics being used, and secondly, there was an overall reduction in the duration of therapy as well. As a result of that, we've now implemented routine AMS reviews for all patients who have sepsis related MET calls.

Zohal Rashidzada, Senior Infectious Diseases Pharmacist, The Alfred Hospital, Victoria

- A new 'Sepsis Call-Out' page to be activated by triage nurses if they suspect a patient has sepsis. Similar to a 'Stroke Call-Out', the page is time-stamped and sent to a multidisciplinary team including senior medical, nursing and pharmacy staff, triggering a rapid response.
- AMS updates to the hospital's sepsis guidelines, including guidance on the empiric antimicrobial treatment, to be started before culture test results are known.
- A review and update of the antibiotics carried in ED to ensure ready access to the antibiotics most commonly and urgently required in acute sepsis management.
- The development of an evidence-based antibiotic administration resource to support the rapid administration of antimicrobials by nurses.
- Updates to the Medical Emergency Team (MET) call response pathways, to include a mandatory documented assessment for possible sepsis in any deteriorating patient.
- The introduction of a new, prioritised AMS review within 48 hours for patients receiving antibiotics for sepsis after a MET call, to ensure the appropriateness of their treatment.

How were changes supported?

- Sepsis Working Groups provide overall governance for the management of sepsis at The Alfred, including monitoring the hospital's results, making recommendations for further improvements, and ensuring that the hospital workforce has access to appropriate education and training. Acknowledging the particular challenges of sepsis in Emergency Departments, The Alfred established two groups, one dedicated to sepsis in the ED, and one for the hospital overall. The groups are multidisciplinary with representation from the Hospital Executive, the Intensive Care Unit, the ED, Nursing, Pharmacy and consumers.
- The metrics included in the Sepsis Working Groups' monthly audits include: median time to antimicrobials measured from presentation at ED; proportion of patients who receive antimicrobials within recommended time; ICU admission rates for patients with sepsis; sepsis-related mortality; and specifics relating to any incidents of delay.
- As part of the 'Sepsis Call-Out', ED pharmacists who have completed locally developed sepsis credentialling are given specific responsibility for charting antimicrobials after review of relevant past medical history, allergies and



Quality statements

2. Time-critical management

3. Management of antimicrobial therapy

Read more about the Quality Statements in the Sepsis Clinical Care Standard:

safetyandquality.gov.au/sepsis-ccs

previous microbiology cultures and a discussion with the doctor on the potential source of infection. First doses of antimicrobials are then drawn up by the pharmacist for immediate administration by the nurse. This approach supports appropriate choice of antimicrobials according to the local and national guidelines and enables doctors and nurses to focus on other time-critical sepsis tasks such as establishing intravenous lines, obtaining blood cultures and delivering fluids.

- Routine AMS review was implemented to optimise antibiotic prescribing for all patients with MET calls for sepsis, and was conducted within 48 hours of the MET call. Patients were identified from the hospital's risk management system and AMS review was prioritised.

Outcomes

To inform improvement processes, The Alfred first collected baseline data about antimicrobial response time in the ED for patients with sepsis who subsequently required treatment in the ICU. They were later able to compare those results, with results collected in audits after changes were made.

- In baseline audits, the time from ED presentation to first doses of antibiotics was averaging 110 minutes. This was significantly outside the recommended time-frame of 60 minutes. Following the 'Sepsis Call-Out' improvement initiative, average times within the post-intervention group were reduced to 55 minutes. This result has been sustained consistently over time since implementation in 2016, due in large part to the leadership and engagement of the ED pharmacists.

Baseline: 110 minutes

In baseline audits, the time from ED presentation to first doses of antibiotics was averaging 110 minutes.

After intervention: 55 minutes

Following the introduction of the 'Sepsis Call-Out', average times within the post-intervention group were reduced to 55 minutes.

At a Glance

Issues

- Needing to improve time to first dose of antimicrobials in ED
- Needing to improve the appropriate duration and choice of antimicrobials for hospital inpatients

Solutions

- Establishing the new role of Sepsis Pharmacist
- Embedding AMS in sepsis pathways for both ED and inpatients by developing sepsis and antibiotic guidelines
- New multidisciplinary 'Sepsis Call-Out' alert with specific responsibilities for ED pharmacists
- Integrating sepsis assessment and management with pre-existing MET call pathways
- Prioritised AMS reviews of antibiotics prescribed after a MET call for inpatients with suspected sepsis

Barriers

- Continuing to work towards ensuring a balance between the need to administer antibiotics quickly in response to sepsis, and the need to ensure appropriateness of antibiotics as part of sound antimicrobial stewardship
- Lack of data on the appropriateness of prescribing after MET calls

Enablers

- Study of AMS intervention supported and funded by hospital executive
- Introduction of multidisciplinary Sepsis Working Groups to improve sepsis outcomes
- Education and training for medical, nursing and pharmacy staff
- Upskilling of triage nurses and ED pharmacists
- Training embedded in junior medical and nursing staff inductions

Zohal and her colleagues also conducted a randomised controlled trial of patients who had received a MET call for suspected sepsis, comparing the results of the intervention group with those of a group receiving standard care.

- According to baseline audits, around 50 % of patients with suspected sepsis were receiving prolonged or inappropriate antimicrobial therapy. Within the intervention group, the proportion of patients receiving appropriate antimicrobials 72 hours after a MET call was 67%, compared to 44% in the control group.
- Patients in the intervention group were given an AMS review within 48 hours. Of the 27 recommendations made by the AMS team, 74% were accepted by clinical staff. This included cases where antimicrobials were discontinued or de-escalated.
- There were also small improvements in results for patients in the intervention groups compared to control groups around:
 - **Total duration of antimicrobial therapy**
8.7 days compared to 10.7 days
 - **Sepsis-related ICU-admission rates**
13% compared to 18%
 - **Sepsis-related in-hospital mortality**
7% compared to 9%.



More Implementation Studies

Read more about the implementation of improvements in sepsis care:

safetyandquality.gov.au/sepsis-implementation

- Implementing a paediatric sepsis program in partnership with families affected by sepsis
- Delivering better sepsis care in regional and remote communities

Resources

- [Sepsis Clinical Care Standard](#)
- [Early antimicrobial stewardship team intervention on appropriateness of antimicrobial therapy in suspected sepsis: a randomized controlled trial.](#) Zohal Rashidzada, Kelly A Cairns, Trisha N Peel, Adam W Jenney, Joseph S Doyle, Michael J Dooley, Allen C Cheng.
- [Improving sepsis care for hospital inpatients using existing medical emergency response systems.](#) *Infect Dis Health.* 2020 Mar;25(2):63-70. Khanina A, Cairns KA, McGloughlin S, Orosz J, Bingham G, Dooley M, Cheng AC.
- [Antimicrobial guidance for sepsis programs](#)