Factors in Antibiotic Administration Delay in Sepsis

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## Background

Sepsis is a life-threatening condition in response to infection which involves significant organ dysfunction.[1] Time to appropriate antibiotic therapy is a key determinant of mortality and other outcomes among patients with severe sepsis.[2] International guidelines recommend antibiotic administration within 1 hour of sepsis recognition, yet antibiotic delay in sepsis remains common.[3] Therefore it is important to determine barriers which contribute to these delays.

## Aim

To determine the association between delayed antibiotic administration in sepsis among ED/ward adult patients and:

• Patient factors • Sepsis recognition factors • Clinical and communication factors • Organisational factors

## Methods

Sample and setting: Retrospective cohort study of 119 ED and 37 inpatient ward adult patients diagnosed with sepsis who had a MET call and were administered antibiotics between 01/10/2017 and 30/06/2019 at Northern Hospital, an outer metropolitan hospital in Melbourne, Australia.

Data Collection and Analysis. Variables were included if present between MET call and first antibiotic administration. Time to antibiotics was defined as time between initial MET call for sepsis and administration of first antibiotic dose. Delay to antibiotics was defined as the first dose occurring ≥60 minutes after sepsis onset, where sepsis onset was represented by meeting MET call criteria. Fisher's exact test and a multivariable binary logistic regression with robust error variances were used for statistical analysis.

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## Cohort Characteristics

76 years median age

51.3% male

62.2% born overseas

61.5% English-speaking

Source of sepsis - most frequently **respiratory tract** (53.2%), **urological** (19.9%), and **abdominal** (14.7%)

Median time to antibiotics - **60 minutes** (IQR=33-163 minutes)

**50.6%** received antibiotics at ≥60 minutes

## Factors Associated With Antibiotic Delay In Septic Patients

Patient age of **<75 years** *(p=0.039)*

**Higher (less acute) ED triage category** among ED patients *(p=0.035)*

**Afebrile** 24 hrs prior to first antibiotic dose *(p=0.020, OR 2.48, 95%CI 1.25-4.94)*

**Awaiting investigatory results** before antibiotic administration *(p<0.001)*

Antibiotics for sepsis charted in the **regular section** of medication chart instead of STAT section *(p=0.009,OR 3.39, 95%CI 1.45-7.96)*

**Multiple teams** involved in patient care *(p=0.002)*

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## Conclusion

Delay to antibiotic administration in sepsis is common.

Patient, sepsis recognition, clinical, and organisational factors are all associated with delays.

Quality improvement interventions targeting different domains are required to reduce time to antibiotics and improve patient outcomes. These may include education initiatives concerning atypical presentations such as afebrile sepsis, how to recognize septic sources based on history and examination, protocols reinforcing antibiotic prescribing in the STAT section of medication charts, and promoting clear communication and documentation between teams regarding patient management.

## References

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