

Review of the application and outcomes of the protocol for the management of pre-hospital sepsis with paramedic diagnosis and delivery of antibiotics at Isle of Wight NHS Trust

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Background

A protocol for administration of an initial dose of IV piperacillin/tazobactam by paramedics under a Patient Group Direction (PGD) before arrival at hospital was introduced at the Isle of Wight NHS Trust in 2013 to improve delivery of the sepsis care bundle, particularly time to antibiotic administration. Previous work has shown that paramedics could accurately recognise sepsis, aseptically take blood cultures and safely and rapidly commence treatment before reaching the emergency department¹ (ED).

Following successful implementation of the protocol for patients with neutropenic or post chemo sepsis and catheter associated urinary tract infection related sepsis, the protocol was broadened in 2015 (PrePip2) to include most adults with suspected sepsis.

Changes in the recommended antibiotic choice for inpatients with sepsis led us to review the paramedic-delivered protocol.

Aims/objectives

- To understand the patient population in whom PrePip2 protocol is used
- To assess the appropriateness of the current antibiotic used based on microbiological results and thereby
- To inform and shape future protocol updates



Method

The first thirty patients who received the protocol from 1 Jan 2018 were included in this review of the paramedic database, laboratory results and electronic discharge summaries.

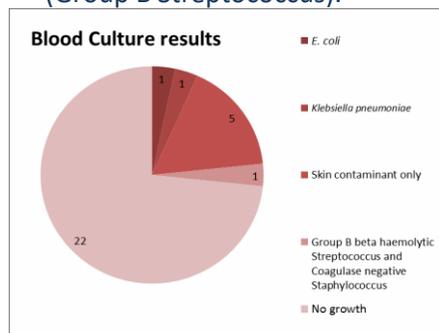
Paramedic sepsis diagnosis was compared with subsequent ED or admission discharge summary diagnoses, as recorded in the patient electronic record.

Duration of any subsequent hospital admission was ascertained and 30 day mortality reviewed.

Blood culture positivity and contamination was identified, along with assessment of antibiotic susceptibility to piperacillin/tazobactam and co-amoxiclav of significant pathogens isolated from samples taken within 72 hours of admission.

Results 2

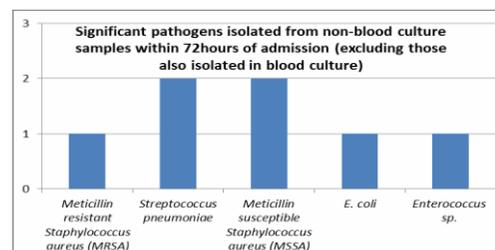
- All 30 patients had blood cultures taken.
- Eight were positive of which 6 (20%) grew a skin contaminant, including 1 sample also growing a pathogen (Group B Streptococcus).



Antibiotic Susceptibility

- All 3 significant blood culture isolates were susceptible to co-amoxiclav.
- Significant pathogens were also isolated from non-blood culture samples within 72 hours of admission in 7 further patients.

The only isolate not susceptible to co-amoxiclav was a Meticillin Resistant *Staphylococcus aureus* (MRSA) from a skin swab



Results 1

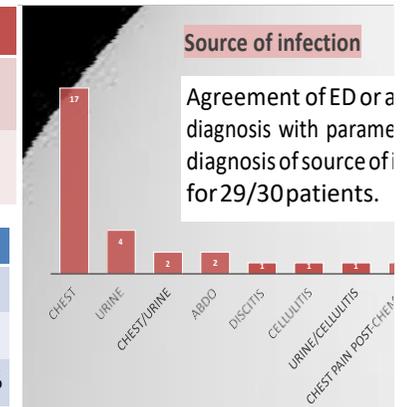
Demographics n = 30		
Gender	Male 13 (43%)	Female 17 (57%)
Age range	35 – 89 (mean 67)	44-100 (mean 80)

Length of stay & Mortality

10 patients were not admitted from ED

Length of stay 2 – 30 days (mean 6 days)

2 of 30 patients died. 30 day mortality = 6.7%



Discussion

- Concordance between paramedic diagnosis of sepsis and ED diagnosis appeared high, although further confirmation of diagnostic accuracy is needed using objective sepsis criteria, particularly given lack of admission for a third of the patients.
- Good documentation of protocol application was noted in the paramedic records. However, subsequent changes to

the definitions and diagnosis of sepsis and the revised National Early Warning System (NEWS2) parameters mean the protocol and associated Patient Group Direction (PGD) require review and updating regarding the criteria for inclusion.

- Empirical coverage of subsequently identified pathogens in this group of patients was high, and would indicate adequate spectrum of cover could be maintained if the antibiotic used in the protocol was narrowed from piperacillin/tazobactam to co-amoxiclav.
- Blood culture contamination rates are high in this initial cohort and require further investigation

Conclusions/outcomes

The IOW Ambulance Protocol for the recognition and treatment of sepsis in pre-hospital environment is being updated in line with the mandatory implementation of NEWS2 scoring and threshold for treatment and using current definitions.
The results of this audit of the cohort of patients who were treated under the protocol support the clinical decision to switch to co-amoxiclav in this setting.

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References

1. Pike J et al. Can Paramedics Treat Sepsis. *Journal of Paramedic Practice* 2015; 7(9): 459-465
2. Singer M et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis – 3). *JAMA* 2016; 315 (8): 801-810