

# **The State of the Evidence for Emergency Medical Services Care of Adult Patients with Sepsis: an Analysis of Appraised Research from the Prehospital Evidence-Based Practice (PEP) Program**

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## **Introduction**

The Prehospital Evidence-Based Practice (PEP) program is an online, freely accessible, continuously updated Emergency Medical Services (EMS) evidence repository. This summary describes the research evidence for the identification and management of adult patients ( $\geq$  age 16) with sepsis or septic shock.

## **Methods**

PubMed was searched in a systematic manner. One author reviewed titles and abstracts for relevance and two authors appraised each study selected for inclusion. Primary outcomes were extracted. Trained appraisers scored studies on a three-point Level of Evidence (LOE) scale (based on study design and quality) and a three-point Direction of Evidence (DOE) scale (supportive, neutral, or opposing findings based on the studies' primary outcome for each intervention). LOE and DOE of each intervention were plotted on an evidence matrix (DOE x LOE).

## **Results**

Eighty-eight studies were included for 15 interventions listed in PEP for adult patients with sepsis. The most frequently studied interventions were related to identification tools (n=26, 30%) and early goal directed therapy (EGDT) (n=21, 24%). Common identification tools included the Systemic Inflammatory Response Syndrome (SIRS) score, quick Sequential Organ Failure Assessment (qSOFA) score. The most common primary outcomes were related to final diagnosis (n=30, 34%), mortality (n=40, 45%) and treatment goals (e.g. time to antibiotic) (n=14, 16%). The evidence matrix rankings for the supported interventions were: supportive-high quality (n=1, 7%) for crystalloid infusion, supportive-moderate quality (n=7, 47%) for identification tools, prenotification, point of care lactate, titrated oxygen, temperature monitoring, and supportive-low quality (n=1, 7%) for vasopressors. The benefit of prehospital antibiotics and EGDT remain inconclusive with a neutral DOE. There is moderate level evidence opposing the use of high flow oxygen. No evidence was found for the use of hypertonic saline.

## **Conclusion**

EMS interventions for the management of sepsis are informed primarily by moderate quality supportive evidence. Prehospital assessments, crystalloids, oxygen, and prenotification were supported by moderate to high quality evidence, but the optimal identification tool remains unclear. Limited evidence is available supporting prehospital use of standard in-hospital therapies such as antibiotics and EGDT. This evidence analysis can guide the implementation of prehospital management by paramedics.