State of the Evidence for Prehospital use of Point-of-Care Lactate in Patients with Sepsis: A report from the Prehospital Evidence Based Practice (PEP) Program

J Greene, AJE Carter, J Goldstein, JL Jensen, J Swain, R Brown, Y Leroux, D Lane

Introduction
Early and accurate diagnosis of critical conditions is essential in emergency medical services (EMS). Serum lactate testing may be used to identify patients with worse prognosis, including sepsis. Recently, the use of a point-of-care lactate (POCL) test has been evaluated in guiding treatment in patients with sepsis. Operating as part of the Prehospital Evidence Based Practice (PEP) Program, the authors sought to identify and describe the body of evidence for POCL use in EMS and the emergency department (ED) for patients with sepsis.

Methods
Following PEP methodology, in May 2018, PubMed was searched in a systematic manner. Title and abstract screening was conducted by the program coordinator. These studies were collected, appraised and added to the existing body of literature contained within the PEP database. Evidence appraisal was conducted by two reviewers who assigned both a level of evidence (LOE) on a novel three tier scale and a direction of evidence (supportive, neutral or opposing; based on primary outcome). Data on setting and study design were also extracted.

Results
Eight studies were included in our analysis. Three of these studies were conducted in the ED setting; each investigating the POCL test's ability to predict severe sepsis, ICU admission or death. All three studies found supportive results for POCL. A systematic review on the use of POCL in the ED determined that this test can also improve time to treatment.
Five of the total 8 studies were conducted prehospitally. Two of these studies were supportive of POCL use in the prehospital setting; in terms of feasibility and the ability to predict sepsis. Both of these study sites used this early information as part of initiating a "sepsis alert" pathway. The other three prehospital studies provide neutral support for POCL. One study demonstrated moderate ability of POCL to predict severe illness. Two studies found poor agreement between prehospital POCL and serum lactate values.

Conclusion
Limited low and moderate quality evidence suggest POCL may be feasible and helpful in predicting sepsis in the prehospital setting. However, there is sparse and inconsistent support for specific important outcomes, including accuracy.