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Predicting Severe Sepsis in the Pediatric ICU: A Simple Clinical Decision Support Tool

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Background: Sepsis is a leading cause of pediatric mortality worldwide, often with delayed identification. Decision support tools have been proposed as a means for improving early recognition of pediatric sepsis.

Objectives: Our goal is to improve recognition of severe sepsis in the pediatric ICU by using a automated sepsis trigger. Our simple clinical decision support tool is an electronic medical record-generated 2 part screen that includes a Best Practice Alert (BPA) plus a bedside perfusion screen before activation of a bedside sepsis huddle and initiation of our severe sepsis algorithm.

Methods: We built an interruptive BPA that triggers for any pediatric intensive care unit patient in our institution with a temperature derangement (defined as 38.5°C or 35.0°C) and blood culture ordered within 6 hours. This BPA prompts the bedside nurse to perform a perfusion screen and select an acknowledgment reason (Fig. 1). We evaluated the test characteristics of the BPA alone and with the bedside perfusion screen to predict severe sepsis.Fig. 1. Clinical decision support sepsis identification tool. This tool flags high-risk pediatric patients enabling a nursing assessment and prompt calling of a sepsis huddle if applicable. will the figure be included?

Results: Initial validation occurred over a one week period in a nonproduction environment. The alert fired with 100% accuracy over those 7 days, that is, no patients who met criteria were missed, and all patients who flagged met criteria. Pilot results from 83 days (1,859 patient-days) demonstrated a positive likelihood ratio of 30.41 (95% CI, 23.15–39.96) and a negative likelihood ratio of 0.09 (95% CI, 0.05–0.18).

Conclusions: Our 2-step process of a BPA plus perfusion screen shows preliminary promise as a feasible and simple screening tool for severe sepsis in the pediatric intensive care unit.

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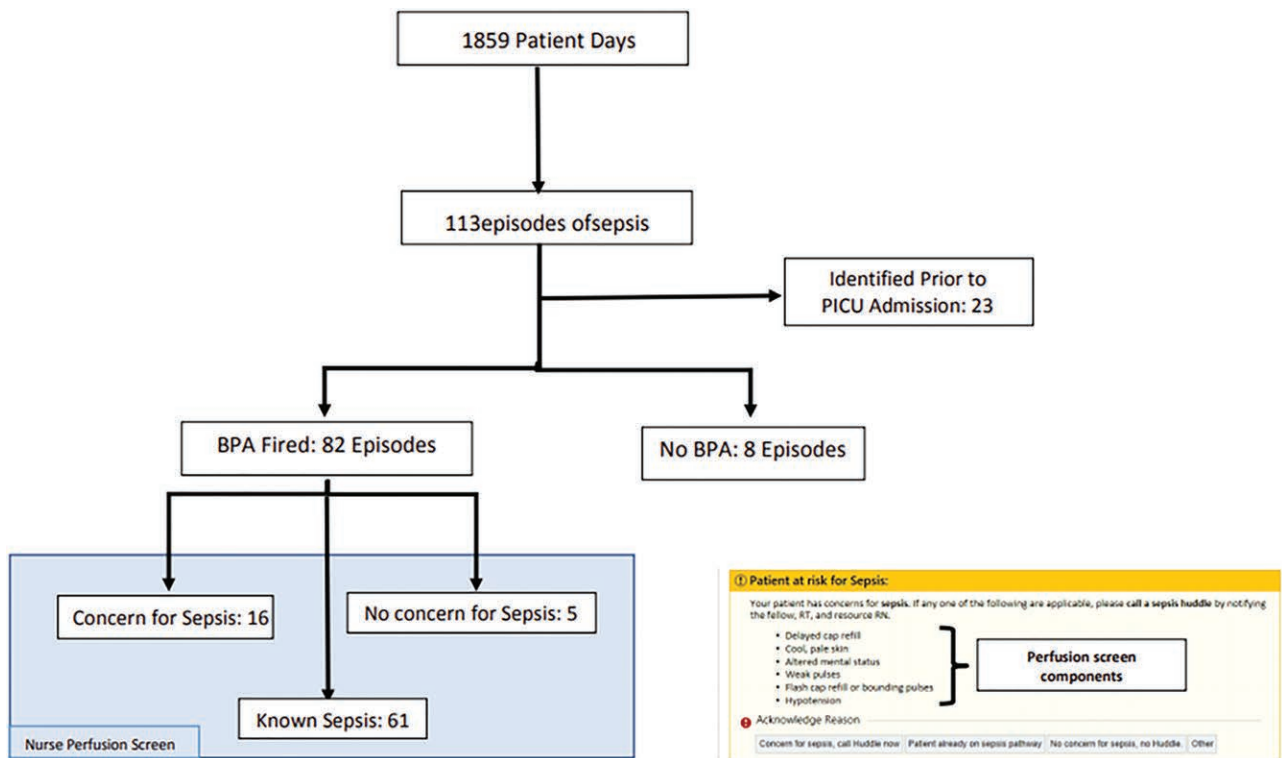
Fig. 1.