PHS Sepsis Best Practice Alert (BPA) Criteria and Logic

Overview: Sepsis BPAs have been built at Partners that utilize clinical data available in Epic to provide real-time alerts to providers and nurses about the possibility of sepsis or septic shock. The logic for these BPAs was chosen both from available evidence and the clinical expertise of the Partners Sepsis Collaborative. The BPAs have undergone extensive pilot testing and validation but will still certainly flag some patients who do not actually have sepsis. **However, the primary purpose of the BPAs is to increase sepsis awareness and improve compliance with evidence-based sepsis bundles when appropriate.**

There are 3 different types of sepsis BPAs, stratified by the severity of the patient's underlying physiology. The BPAs all rely on presence of clinical markers of possible infection, using the following data elements:

Possible Infection	High Suspicion of Infection
• Temperature >100.4 (24 hours) • WBC >15 (24 hours) • Urinalysis with > 20 WBCs (24 hours) • Culture ordered (48 hours) • ED Screen+ for "Possible Infection"	• IV Antibiotics (48 hours) *(only for sepsis and septic shock BPAs, not at-risk BPA)* • Bands ≥5% (24 hours) • ED Screen+ for "Looks Sick"

The number of hours in parentheses following each criterion represents the "look-back" period for the BPA. In other words, a temperature of >100.4 will populate the BPA infection criteria for the following 24 hours.

In addition, the At-Risk Sepsis BPA also incorporates patient risk factors, using demographic data, prior surgeries, or the patient's problem list and/or medication list.

Sepsis Risk Factors	
• Age ≥60	• Cancer
• Diabetes	• Heart Failure
• End Stage Renal Disease	• Chronic Lung Disease IV Drug Use
• Cirrhosis	• Surgery within 30 days
• Transplant	• Immunosuppressants

Exclusion Criteria: Of note, the BPAs will only fire in the emergency department (ED) or inpatient ward setting; **ICU's are excluded** (since these patients all have severe physiologic derangements and are already closely monitored). Other exclusion criteria include surgery within the prior 24 hours and orders for comfort measures.

The 3 levels of BPAs are summarized below. If criteria for multiple BPAs are met simultaneously, only the highest-level BPA will fire. Once acknowledged, the same or lower-level BPAs will be suppressed for 48 hours.

LEVEL 1: At-Risk Sepsis BPA (Possible Infection + Abnormal Vitals +/- Risk Factor)

The goal of this BPA is to flag patients who may have unrecognized or impending sepsis and might require timely diagnostic tests (i.e., lactate, cultures, and other labs) to identify underlying organ dysfunction and timely antibiotics and/or fluids. The BPA incorporates criteria indicative of differing suspicion of infection (possible vs high-suspicion), sepsis risk factors, and physiologic derangements adapted from "quick SOFA" criteria. In addition to qSOFA, the BPA incorporates a shock index (heart rate / systolic blood pressure) >1 given our institutional experience and its known association with poor outcomes in sepsis.

The BPA criteria differs slightly in the inpatient vs ED setting, with slightly higher thresholds required for inpatient firing (since the hospitalized patient is sicker at baseline than the average patient presenting to the ED). In addition, **as opposed to the sepsis and septic shock BPAs, the administration of IV antibiotics does not**

populate the infection criteria for this BPA (since these patients are already presumably recognized to have infection).

ED At-Risk Sepsis BPA Criteria	Inpatient Ward At-Risk Sepsis BPA Criteria
High Suspicion of Infection + ≥1 of: [SBP <100, HR > SBP, or (RR >22 + AMS)]	High Suspicion of Infection + **≥**2 of: (SBP >100, HR > SBP, RR >22, or AMS)
Possible Infection + Risk Factor + ≥1 of: [SBP<100, HR >SBP, or (RR >22 + AMS)]	Possible Infection + Risk Factor + **≥**2 of: (SBP >100, HR > SBP, RR >22, or AMS)
Possible Infection (without Risk Factor) + ≥3 of: (SBP<100, HR>SBP, RR >22, or AMS)	Possible Infection (without Risk Factor) + **≥**3 of: (SBP >100, HR > SBP, RR >22, or AMS)

Altered mental status (AMS) is captured via a variety of data sources, including abnormal Glasgow Coma Scale, RASS score, or ED chief complaints.

LEVEL 2: Sepsis BPA (Possible Infection + Organ Dysfunction)

The goal of this BPA is to flag patients who might already have frank sepsis with organ dysfunction and are candidates for timely "bundles" or care, as per CMS SEP-1 criteria.

Sepsis (Infection + Organ Dysfunction)
Possible or High Suspicion of Infection + ≥1 of the following: • SBP < 90 • Lactate >2.0 mmol/L • Creatinine >2 (acute rise) (excludes patients with end-stage renal disease) • Initiation of mechanical ventilation or non-invasive positive pressure ventilation

LEVEL 3: Septic Shock BPA (Possible Infection + Persistent Hypotension or Lactate ≥ 4)

The goal of this BPA is to flag patients with septic shock, who may require aggressive fluids and/or vasopressors and repeat volume assessments (as per CMS criteria). Many of these patients may require ICU-level care.

Septic Shock
Possible or High Suspicion of Infection + • SBP <90 that persists for >3 hours, OR • Lactate ≥4.0 mmol/L