

## Early Recognition of Sepsis

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The Society of Critical Care Medicine and the European Society of Intensive Care Medicine recently proposed a new consensus definition and clinical criteria for sepsis [1]. They have eliminated items of tachycardia and fever in the SIRS category and used the scoring organ dysfunction for defining sepsis. The quick Sequential Organ Failure Assessment (SOFA) score is recommended for rapid screening for sepsis, and they claim that sepsis should be considered if a patient shows two out of the following: tachypnea (respiratory rate >22 per minute), altered mental status (Glasgow coma score <15), or hypotension (systolic blood pressure <100 mmHg).

The motivation for the revision of the sepsis definition is based on the poor sensitivity and specificity of the SIRS criteria which can include trauma and other forms of inflammation [2] but it remains to be determined whether this revised set of diagnostic criteria will improve the clinical care of patients at risk for sepsis. Consider the following patient: 72 year old male admitted for post-acute stage of ischemic brainstem stroke along with urinary catheterization and peripheral catheter placement who develops fever of 39 degree Celsius and tachycardia of 120 per minute but without tachypnea, altered mental status, or hypotension. The respiration rate is 20, the GCS of 15, and the blood pressure of 110/80 mmHg.

This patient is at risk for sepsis, most probably healthcare-associated infections which includes healthcare-associated pneumonia, aspiration pneumonia, catheter-associated urinary tract infection, or peripheral line associated blood stream infection. Because of the elevated risk for sepsis and septic shock, aggressive clinical management steps are warranted for possible sepsis.

Thus, the newly proposed quick SOFA screening tool overlooks critical elements in the workup for fever in patients at risk for sepsis, since the new screen does not include tachycardia and fever. In fact, among vital signs, blood pressure and temperature are highly variable in terms of inter-individual differences. The same value of blood pressure may indicate obvious clinical shock in one patient and yet, be apparently normal in another. Similarly, a normal temperature in one patient may indicate the absence of infection in one individual but be associated with sepsis in another (geriatric patient).

Thus, by considering variations of blood pressure, we propose the use of a shock index (pulse rate/systolic blood pressure) greater than one, which could capture the early signs of shock or pre-shock in patients with possible sepsis. This phenomenon of “vital-sign reversal”, pulse rate over systolic blood pressure, better captures the serious change of pulse rate as well as blood pressure.

Moreover, the careful attention to shaking chills in high risk patients may improve the recognition of possible sepsis, since this important symptom is highly associated with bacteremia with relative risk above 10 [3]. It is still important to recognize a traditional symptom indicating the seriousness of numerous classical infectious diseases including falciparum malaria [4].

Based on the above consideration, we further propose that the early screening tool for sepsis, include the presence of two or more of the following: tachypnea, altered mental status, pulse rate over systolic blood pressure, or shaking chills. Such a clinical screening tool should be cleared by face validity of clinicians who care for numerous patients with sepsis. After this validation, a screening tool should be evaluated through clinical trials and careful research before implementing the widespread use of the tool into clinical practice. This is an important challenge but when well worth meeting.

### References

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