

## Prediction of Sepsis Progression in Critical Illness Using Artificial Neural Network

F. M. Suhaimi<sup>a</sup>, J. G. Chase<sup>b</sup>, G. M. Shaw<sup>c</sup>, U. K. Jamaludin<sup>d</sup>, N. N. Razak<sup>e</sup>

<sup>a</sup>Advanced Medical and Dental Institute, Universiti Sains Malaysia

<sup>b</sup>Department of Mechanical Engineering, University of Canterbury

<sup>c</sup>Department of Intensive Care, Christchurch Hospital

<sup>d</sup>Department of Electronics & Communication Engineering, Universiti Tenaga Nasional

<sup>e</sup>Department of Mechanical Engineering, Universiti Malaysia Pahang

### ABSTRACT

Early treatment of sepsis can reduce mortality and improve a patient condition. However, the lack of clear information and accurate methods of diagnosing sepsis at an early stage makes it become a significant challenge. The decision to start, continue or stop antimicrobial therapy is normally based on clinical judgment since blood cultures will be negative in the majority of cases of septic shock or sepsis. However, clinical guidelines are still required to provide guidance for the clinician caring for a patient with severe sepsis or septic shock. Guidelines based on patient's unique set of clinical variables will help a clinician in the process of decision making of suitable treatment for the particular patient. Therefore, biomarkers for sepsis diagnosis with a reasonable sensitivity and specificity are a requirement in ICU settings, as a guideline for the treatment. Moreover, the biomarker should also allow availability in real-time and prediction of sepsis progression to avoid delay in treatment and worsen the patient condition.

**KEYWORDS:** sepsis; sepsis score; neural network; ICU

**DOI: [10.1007/978-981-10-0266-3\\_26](https://doi.org/10.1007/978-981-10-0266-3_26)**