Infectious Disease

Multi-Biomarker Panel for Reliable Detection of Septic Shock

Brief Description of Technology

A novel means to quickly and accurately predict the risk of death for both children and adults with septic shock.

TECHNOLOGY ID

2012-0106

BUSINESS OPPORTUNITY

Exclusive License or Sponsored Research

PATENT INFORMATION

Nationalized

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Technology Overview

Cincinnati Children's researchers have developed and validated a multi-biomarker-based risk model for pediatric and adult septic shock patients for clinical trial stratification, individual patient decision making, and quality assurance efforts. To develop the tool, biomarkers were measured in serum samples from unselected children and adults with septic shock obtained during the first 24 hours of admission to the ICU. Classification and Regression Tree (CART) analysis was used to generate a decision tree to predict 28-day all-cause mortality based on both biomarkers and clinical variables. The derived tree was subsequently tested in an independent cohort of individuals with septic shock. This work has also been extended to develop a temporal version that considers biomarker values at the first and third day following presentation to estimate the probability of a "complicated course," defined as persistence of ≥2 organ failures at seven days after meeting criteria for septic shock, or death within 28 days.

Applications

- Clinical decision support for diagnostic/prognostic value
- Quality metric for mortality indication/hospital performance
- Companion diagnostic for tailored treatment regimens

Advantages

- Allows for the development of a rapid point of care assay to detect sepsis in <2 hours and provides new insight into sepsis pathology
- Predicts patients at high risk for poor outcomes and guides treatment decisions
- Can be used to track patient progress during care
- Helps triage patients to the appropriate level of care (e.g. ICU, step-down)

Market Overview

There are approximately 750K cases of sepsis each year in the US, and with a mortality rate of 26% sepsis kills more people than stroke and pneumonia.