

Faster Answers, Saved Lives: UCLA Innovation Powers A Breakthrough In Sepsis Detection

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Emergency medicine's goal is to rapidly assess, stabilize, treat, and manage patients with acute illnesses or injuries that require immediate medical attention. For emergencies like heart attack and stroke, well-established protocols and diagnostic tools—such as electrocardiograms (EKGs) and computed tomography (CT) scans—help physicians quickly assess and diagnose patients. The impact of these interventions and technological advancements on patients' lives has been profound. Now, one Silicon Valley company is applying these lessons to another critical medical emergency: sepsis.



Sepsis is a life-threatening condition caused by a dysregulated immune response that claims approximately 350,000 lives each year in the United States. About 87% of patients with sepsis first present to the emergency department with infection symptoms, and their condition can deteriorate rapidly. Those experiencing septic shock show an 8%

increase in mortality for every hour that treatment is delayed. Unlike heart attack and stroke, sepsis has long lacked a highly sensitive, objective diagnostic test—until now. The IntelliSep® sepsis test by Cytovale is a diagnostic tool that analyzes the biology of sepsis to stratify patients based on their probability of developing sepsis with organ dysfunction within three days following testing. Delivering results in about eight minutes, IntelliSep helps enable faster treatment decisions and improved patient outcomes.

Founded by UCLA faculty member Dino Di Carlo, UCLA Alumnus Henry Tse, and collaborator Ajay Shah, Cytovale is dedicated to enhancing human health through innovative early detection technologies that leverage insightful assessments of immune activation. Addressing one of the leading causes of death in U.S. hospitals, Cytovale's FDA-cleared IntelliSep test provides rapid insights into immune activation and sepsis risk from a simple blood draw.

The Cytovale System uses a combination of ultra-high speed imaging, precision microfluidics, high-throughput image analysis, computer vision, and machine learning to examine biophysical properties of white blood cells and measure immune cell activation. The IntelliSep sepsis test is the first and only application of this technology for sepsis detection.

Commercially available since the fall of 2023, IntelliSep is now showing real-world impact and positive patient outcomes. In a recent peer-reviewed study, *"Impact of a Sepsis Quality Improvement Initiative on Clinical and Operational Outcomes,"* published in *Healthcare*, investigators tracked more than 12,000 patients over 12 months at Our Lady of the Lake Regional Medical Center in Baton Rouge, Louisiana. Their findings included:

- **39% relative rate reduction in sepsis mortality**, with non-sepsis mortality unchanged, validating the impact of IntelliSep on targeted triage.
- **0.76 day decrease in average hospital length of stay** for sepsis patients, with strong implications for improved

throughput and cost reduction.

- **40% decrease in blood culture usage** in low risk patients and an 8% increase in high-risk cases, underscoring the ability of IntelliSep to help providers fine-tune diagnostic precision.

UCLA Technology Development Group licensed the technology to Cytovale, which has received funding from the Biomedical Advanced Research and Development Authority (BARDA), part of the office of the Assistant Secretary for Preparedness and Response at the U.S. Department of Health and Human Services in 2020, and in 2024 closed a [\\$100M Series D funding round](#).

The development of IntelliSep represents a major leap forward in emergency care diagnostics, turning what was once a race against time into an opportunity for timely, targeted treatment. Building on the vision of UCLA innovators, IntelliSep is redefining how clinicians identify and respond to sepsis, saving lives and improving hospital efficiency.

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