

NCATS Wow! Factor Story

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Early warning device alerts to sepsis, saves lives

SUMMARY OF PUBLIC HEALTH IMPACT

Research physicians at Oregon Health & Science University (OHSU) developed bedside technology for quickly detecting sepsis, a life threatening blood infection that leads to death in approximately 30 percent of cases, with an 8 percent increase in mortality for every hour treatment is delayed. The new technology, which detects early changes that lead to quicker treatment, allows health care providers to monitor patients in a variety of settings ranging from emergency departments (ED), intensive care units (ICU), prehospital settings such as ambulances, and potentially even patient homes.

BACKGROUND: Research description, context and related implications for translational science

Sepsis is the leading cause of death in US hospitals. Early detection and treatment improve patient outcomes. Capillary refill time (CRT), a measure of the time it takes for a distal capillary bed (e.g., fingertip) to regain color after applying pressure, is prolonged in patients with sepsis. This simple and commonly employed measure is used to triage patients in the ED. Studies indicate CRT-guided resuscitation for sepsis yields better morbidity and mortality outcomes than the current standard measure, serum lactate. But CRT measurements are subjective and thus prone to error.

OCTRI Scholar Dr. David Sheridan, and Dr. Matthew Hansen, OHSU Emergency Medicine physicians, were awarded a Biomedical Innovation Program grant to develop technology enabling clinicians to accurately and precisely measure CRT. They received additional grants to refine a prototype, conducted a clinical trial, and co-founded a company called Promedix to continue developing the device. Initial findings, published in the December 2020 issue of *Frontiers in Medicine*, listed the device's significant advantages: reflected light technology provides deeper tissue penetration with less signal-to-noise ratio; significantly improved clinical outcomes without large changes to clinical workflow or provider practice; minimal required training; and technology suitable for low-resource settings. The authors say that while their focus is on CRT for sepsis care, the device could be considered the next standard of care vital sign for assessing end-organ perfusion. Ultimately, they hope the sensor will be integrated into existing monitors within the healthcare system. The technology is available for clinical studies, and resulted in the launch of a larger prospective trial in the OHSU ED and ICU. [READ MORE >](#)

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- The Consortium for Technology and Innovation in Pediatrics
- Business Oregon
- OHSU Innovation Development and Entrepreneurship Acceleration Fund

OTHER COLLABORATORS

- Dr. Robert Cloutier, OHSU
- Andrew Kibler, Promedix, Inc.

REFERENCE ARTICLES/LINKS

[HTTPS://WWW.FRONTIERSIN.ORG/ARTICLES/10.3389/FMED.2020.612303/FULL](https://www.frontiersin.org/articles/10.3389/fmed.2020.612303/full)