EDAC™ QUANTIFIER Detects Gaseous Microemboli as Small as 10 Microns

Eliminating emboli from the bypass circuit is a critical issue for cardiac surgery teams. Before you can eliminate it, you first have to identify the source.

The U.S. Food and Drug Administration has recently cleared the EDAC™ (Emboli Detection and Classification) QUANTIFIER, developed by Luna Innovations Incorporated, as the first and only stand alone emboli detection system for use in cardiac surgery.

The EDAC QUANTIFIER uses a sophisticated ultrasound technology to non-invasively detect gaseous microemboli in up to three locations in the extracorporeal bypass circuit. It provides repeatable, accurate measurement of gaseous microemboli previously not quantifiable by the surgical team. Unlike traditional emboli detection systems, the EDAC QUANTIFIER detects microemboli that may otherwise go unnoticed and reports the emboli size and total embolic load in the blood circuit.

In the past, technology limitations prevented a reliable count of gaseous microemboli in the circuit. “Other systems did not provide accurate results as they could not detect gaseous microemboli as small as ten microns, or showers of gaseous microemboli,” says Brooke Jackson, Medical Products Marketing Manager, Luna Innovations Incorporated. “Clinicians had no way of precisely knowing the amount and source of gaseous microemboli present in the circuit.”

Serious consequences can occur when the sources of emboli are not detected and emboli reach a patient, including neurological deficits, strokes or mortality. To improve patient outcomes, the surgical team must first know where the microemboli are entering the extracorporeal circuit. Clinicians can utilize the three simultaneous EDAC sensors to isolate the source of gaseous microemboli, quickly evaluate the procedure and take steps to reduce the embolic load in the bypass circuit.

“The way a patient benefits from using the EDAC is directly related to the cardiac teams’ increase in knowledge regarding the pathways through which air can enter the circuit,” says Dave Fallen, Manager of Perfusion Clinical Services at Terumo Cardiovascular Systems.

Clinicians can instantly observe the presence of microemboli in the blood circuit, make changes to their techniques, and monitor changes in the microemboli rate over time. Data can be exported for analysis and retention.

EDAC provides count rates from zero to 1000 per second and detects emboli as small as 10 microns in diameter. The real-time data provided to the surgical team enables an immediate response to gaseous microemboli they previously did not know were present in the circuit.

“All sources can be monitored continuously and simultaneously with the EDAC system,” adds Mr. Fallen. “Changes in practice by the entire cardiac team can occur through monitoring for the ultrasonic signature of the presence of air in the bypass system.”

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EDAC cleared for low flow rates

EDAC provides key embolic load information in pediatric low flow bypass cases. Regardless of using a bubble trap or an arterial line filter, EDAC offers vital real-time data to the entire surgical team.

- Presents reliable count measurements from a flow rate of 0.2L/minute to 6.0L/minute

Other embolic detection devices, such as Transcranial Doppler, monitor only the end organ and are therefore unable to identify the source of emboli. In contrast, EDAC has a large range of count and flow rates with predetermined alarm thresholds, thus displaying consistent results and preserving the integrity of the embolic documentation. The user-friendly EDAC requires no calibration and little training.

“While a handful of companies have dabbled in creating an accurate gaseous emboli detection device, most researchers or clinicians who have worked with the devices would agree that the results are unreliable and cumbersome,” says Ms. Jackson. “The EDAC offers a new opportunity to see what was previously unknown.”