

UW-Madison Startup's Device Helps Detect Arrhythmias In Infants After Heart Surgery

Wisconsin Alumni Research Foundation



The idea began with alligator clips and electrical tape. Now, a University of Wisconsin Madison startup company is improving care for the tiniest and most vulnerable heart surgery patients.

A doctor's vision for a better way to detect arrhythmias (abnormal heart rhythms) in newborns after major cardiac surgery led to the founding of [Atrility Medical LLC](#) to develop and distribute an innovative medical monitoring device called AtriAmp, which was approved by the FDA in 2020.

Nick Von Bergen, a pediatric cardiac electrophysiologist at American Family Children's Hospital, saw a need for improved detection of arrhythmias, which occur in up to 60% of newborns after major heart surgery. Arrhythmias can be potentially dangerous and prolong hospitalization—especially in small, complex patients.

But diagnosing and treating arrhythmias is challenging. Conventional methods lack either precision or timeliness.

Bedside monitors typically display low-quality signals, while a high-quality electrocardiogram (ECG) can take up to 20 minutes to set up. And even then, expertise is required for ECG detection of subtle rhythms produced by the heart's atrial chamber, which can get lost amid stronger signals from other, larger parts of the heart.

Armed with an idea and a primitive prototype made of alligator clips, wires and electrical tape, Von Bergen connected with a team of UW-Madison biomedical engineering students with the skills to drive product design and development. This collaboration led to the formation of Atrility Medical LLC, which has transformed his vision into an innovative device currently in use at UW Health and around the nation.

The Wisconsin Alumni Research Foundation (WARF) worked with Von Bergen to patent the device and license the technology exclusively to Atrility. In addition, WARF Ventures, a venture capital fund created by WARF, has invested directly in Atrility and holds a seat on the board.

The device is called the AtriAmp. It sits on the outside of a patient's chest and acts as a connection hub, receiving atrial signals from the heart (via wires temporarily implanted during surgery) and sending those signals to the bedside monitor to provide a streaming atrial electrogram in real time. If needed, the AtriAmp can also be connected to a temporary external pacemaker.

Continuous. Immediate. Integrated. It all translates to better care for pediatric patients. A [2023 study](#) found that pediatric cardiologists and pediatric critical care doctors were more confident and more accurate when diagnosing postoperative atrial arrhythmias in using the AtriAmp device than when using a standard ECG.

"It's great to see how far they've come since the team of student engineers and Dr. Von Bergen first submitted their disclosure to WARF," said Stephanie Whitehorse, director of intellectual property for physical sciences. "It's gratifying to be part of the process, enabling early-stage innovation to make it to a product that enhances patient care, and this team has been so fun to work with."

Von Bergen envisions the device moving into the general heart surgery patient population on its merit.

"The reason is just the significant improvements in ease in evaluating heart rhythms," he said. "In this potentially critically ill population, the AtriAmp really does a wonderful job of allowing us to know the patient's heart rhythm, as opposed to saying: *maybe we need a few more tests.*"

This story was originally published in 2024.

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