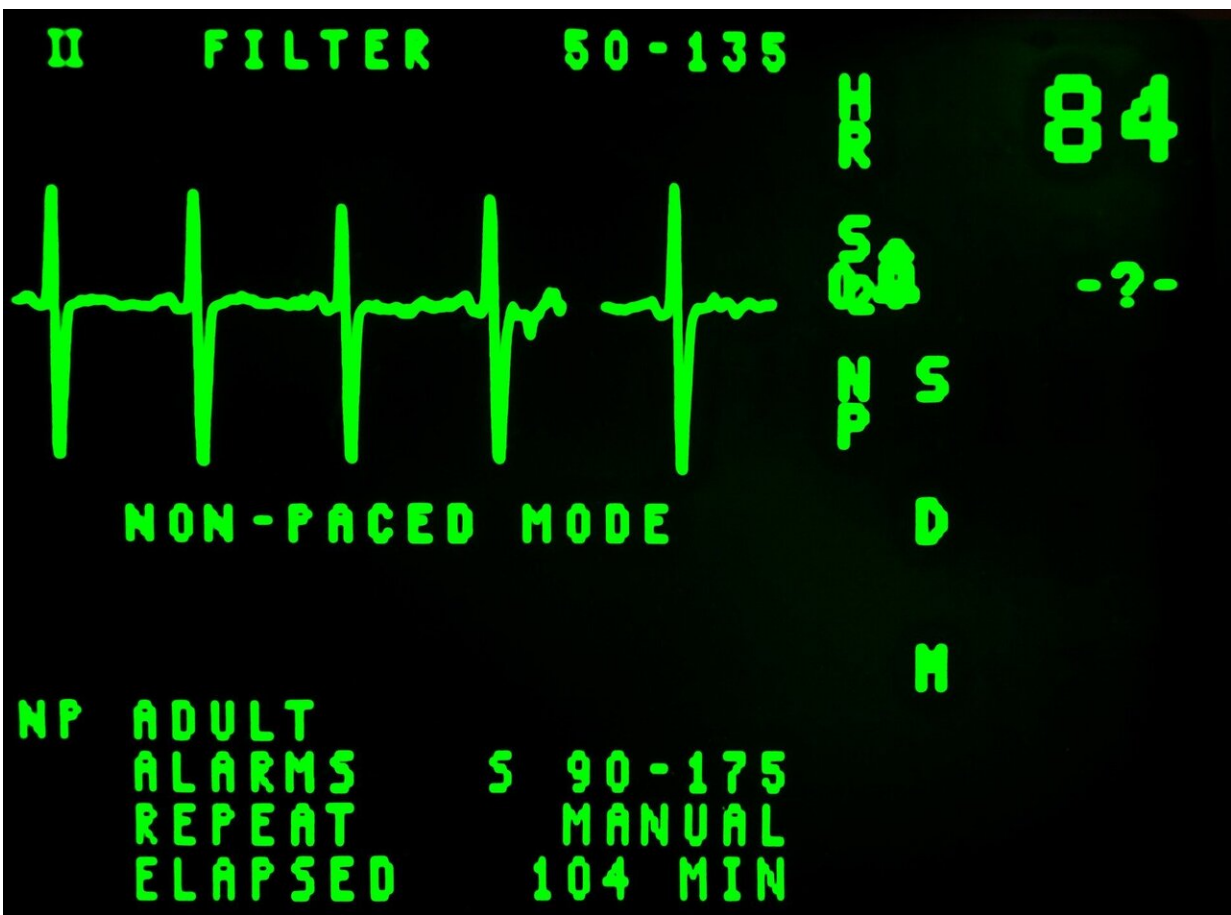


Modular communicative leadless ICD found to be safe and exceeds performance expectations

May 18 2024



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Wireless implantable cardioverter-defibrillators (ICDs) eliminate the lead-related complications that come with a wired ICD, but they are unsuitable for patients with ventricular tachycardia, when the heart beats too quickly, or bradycardia, when the resting heart rate is seen as low.

Research led by Amsterdam UMC, published in the *New England Journal of Medicine*, shows that the first wireless modular system suitable for these patient groups is safe and exceeds performance expectations. Opening the door for a wider roll-out.

In 2021, Amsterdam UMC was the first in Europe to implant this wireless pacemaker that communicates with a subcutaneous ICD. This implantation took place at the beginning of the global Modular ATP study.

"It is the first system in which [medical devices](#), which are implanted separately in the body, are in contact with each other and work together. Its development will reduce the number of complications and invasive procedures all while maintaining [patient safety](#)," says Reinoud Knops, cardiologist at Amsterdam UMC and leader of the study.

The study followed almost 300 patients in 38 hospitals across Europe and North America, and in no cases where pacing was not delivered due to communication failure. Amsterdam UMC and other academic partners, including Emory University, Mount Sinai Hospital and the University of Barcelona, worked together with Boston Scientific to develop this technology, which also exceeded performance expectations.

"We aimed for the two wireless parts communicating successfully in 88% of the attempts but this turned out to be a lot higher, with a success rate of almost 99%," says Knops.

Use of ICD for cardiac arrhythmias

An ICD is often implanted in patients with life-threatening [cardiac arrhythmia](#). If cardiac arrhythmia occurs, this subcutaneous defibrillator can terminate it in two ways. First of all, an ICD can give one or more [electric shocks](#). These shocks are often experienced as painful when the patient is still conscious.

An ICD can also deliver a number of pulses in quick succession via a wire in the heart. Patients do not feel anything from this technique, because the pulses are much smaller than a shock, but not every ICD can also give this second therapy and if it can, the wire is still a disadvantage, because it can regularly cause complications, relating to the wire itself, such as detachment and infection. This is the [driving force](#) behind the search for a fully wireless alternative.

"If the ICD detects a cardiac arrhythmia, it sends a signal to the pacemaker to deliver the pulses. If the arrhythmia persists, the ICD will still give a shock. As a result of this fine-tuning process, the patient will receive an electric shock less often," says Knops.

More information: A Modular Communicative Leadless Pacing-Defibrillator System, *New England Journal of Medicine* (2024).

Provided by Amsterdam University Medical Centers

Citation: Modular communicative leadless ICD found to be safe and exceeds performance expectations (2024, May 18) retrieved 23 June 2024 from <https://medicalxpress.com/news/2024-05-modular-communicative-leadless-icd-safe.html>

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