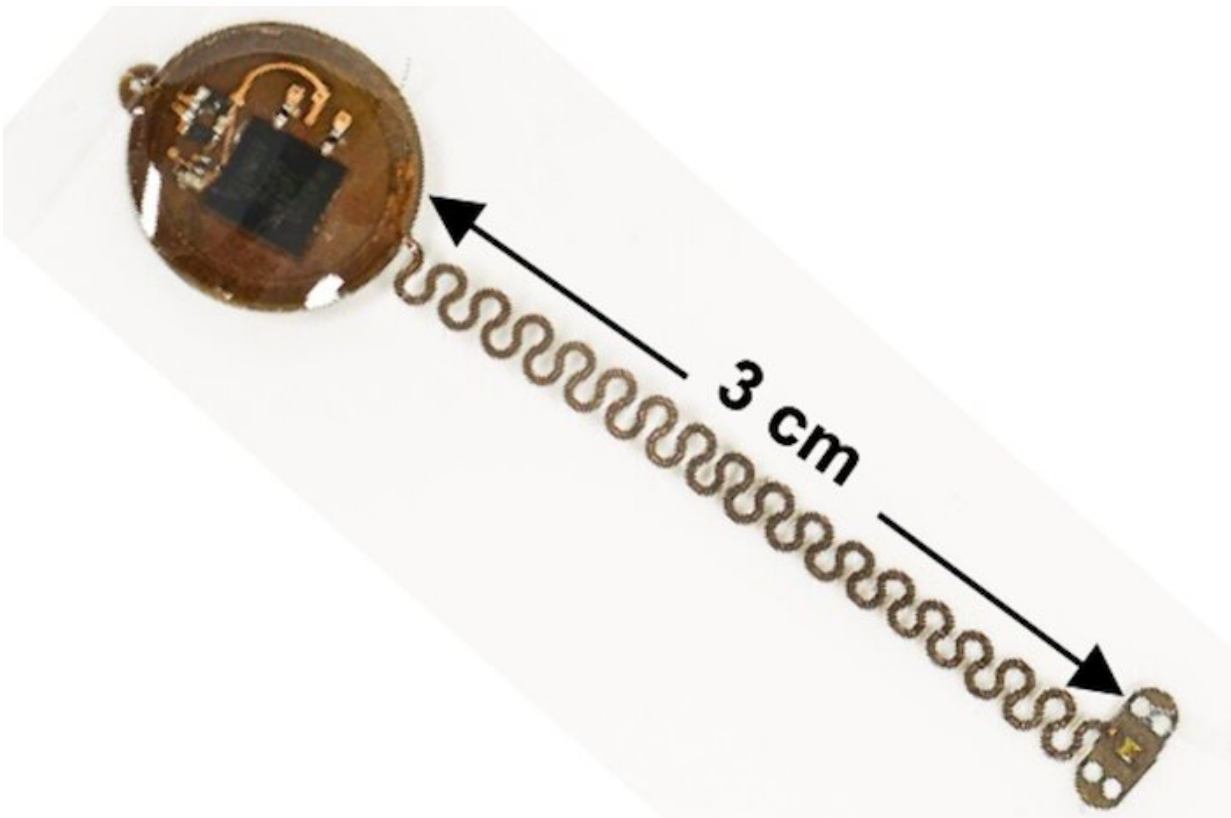


# Battery-free pacemaker reduces equipment to size of a dime

December 18 2019

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Credit: George Washington University

Researchers have developed and tested for the first time in vivo a miniaturized, battery-free pacemaker that supports optical and electrical multisite stimulation. The new device is powered wirelessly, omitting the

weight and bulk associated with battery power, along with the need to replace or recharge, thereby allowing for indefinite operation.

Sudden cardiac death is the largest cause of natural death in the United States with over 300,000 adult deaths each year. Researchers hope this new device will help decrease the number of these deaths.

In current technology, the battery makes up the majority of the size and weight of a pacemaker. This can result in a largely visible device that sits on the upper chest and can cause significant dissatisfaction for patients.

By decreasing the size of a wireless [pacemaker](#) to about the size of a dime, the goal is for doctors to one day place several pacemakers across the heart. Having multiple wireless pacemakers on the heart at once can improve the quality of resynchronization therapy as the devices can be programmed externally to synchronize cardiac excitation and contraction, thus making the devices more efficient, effective and comfortable for patients.

The paper, "Wireless, battery-free, fully implantable multimodal and multisite pacemakers for applications in small animal models," was published in *Nature Communications* on Tuesday, Dec. 17, 2019.

**More information:** Philipp Gutruf et al. Wireless, battery-free, fully implantable multimodal and multisite pacemakers for applications in small animal models, *Nature Communications* (2019). [DOI: 10.1038/s41467-019-13637-w](https://doi.org/10.1038/s41467-019-13637-w)

Provided by George Washington University

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