

## Cardiac Implantable Electronic Device Infection Summit: Bridging Gaps in Awareness, Detection and Appropriate Treatment of CIED Infections

### Background

The use of cardiac implantable electronic devices (CIEDs) is becoming more and more common. While these devices extend and improve people's lives with minimal problems in most cases, for patients who experience infections related to their devices, gaps and delays in guideline-recommended care can lead to preventable illness, disability and death. Data has shown that these kinds of gaps and delays in guideline-recommended care are all too common.<sup>1</sup> Improved awareness and timely diagnosis are essential to help save lives.

The American Heart Association has launched an initiative to improve awareness, detection, diagnosis and treatment of [CIED infection](#) through a two-year effort including a National CIED Infection Summit and a National Health Care Professional Education Plan. In March 2022, the AHA, led by a nine-member planning committee, convened multidisciplinary stakeholders at the in-person CIED Infection Summit and identified three major problems to solve and three preliminary actionable solutions:

#### PROBLEMS TO SOLVE

- **CIED infections are rising, and in too many cases, patients with CIED infections do not receive guideline-recommended care,** resulting in significant and largely preventable morbidity and mortality.<sup>2,3,4</sup>
- **Coordinated systematic approaches are lacking.** Better alignment is needed between multidisciplinary physicians and administration to create streamlined care pathways. Furthermore, communication between patients and physicians needs to be improved.
- **These treatment gaps have a significant impact on clinical and economic outcomes.** Health care burdens related to CIED infection are substantial<sup>1</sup>; health systems could provide higher-value care by addressing this problem.

#### ACTIONABLE SOLUTIONS

- **Educate** multidisciplinary teams of health care professionals, administrators and patients on CIED infection and guideline-directed care.
- **Ensure alignment** between multidisciplinary physicians and administration to create streamlined care pathways.
- **Improve communication** between patients and physicians so patients are engaged, well informed and promptly referred for guideline-directed treatment for CIED infections.

## CIED Infection Is A Public Health Burden

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The annual rate of CIED infections increased from 1.53% in 1993 to 2.41% in 2008.<sup>5</sup>

- 6.2% of patients will experience an infection within 15 years after having a device implanted and 11.7% will by 25 years.<sup>2</sup>
- More than 57% of patients with a CIED infection are not treated according to Class I guideline-directed care, which is full device removal including the leads.
- A trial that followed nearly 2,500 patients who had received implantable cardioverter-defibrillator (ICD)/cardiac resynchronization therapy-defibrillator (CRT-D) devices found that 2.6% experienced a device-related infection in the first three years after implantation, and those patients were more than twice as likely to die in the year following the infection.<sup>3</sup>
- Most local pocket infections — about 55% — occur in the first year after implantation. Others can occur years later, even more than 15 years after the initial procedure.<sup>4</sup>
- Average annual medical costs were 2.4 times higher for CIED patients with an infection, compared to those without an infection.<sup>6</sup>

## Treatment Guidelines Are Clear, But Often Not Followed

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The Heart Rhythm Society's revised 2017 guidelines and 2020 European Heart Rhythm Association's international consensus document offer three priorities for what to do:

1. Patients presenting with a definite CIED infection, endocarditis (regardless of device involvement), or unexplained or persistent bacteremia or fungemia, should be referred to an expert in the treatment of CIED infection.
2. The Heart Rhythm Society's guidelines also call for antibiotics to be initiated after two sets of positive blood cultures are obtained.
3. However, antibiotic treatment alone is not enough; the device and its components should be removed promptly and completely. Other major professional organizations recommending complete removal in patients with a definite CIED infection include the AHA, British Heart Rhythm Society and European Society of Cardiology.

### CALL TO ACTION

This multi-layered call to action relies on health care professionals evaluating how CIED infection patients are being treated, driving guideline adherence and getting the message out that gaps in care exist. Patients are called upon to be advocates for their own health. Stakeholders identified an initial road map to drive change that is outlined in action items organized according to three categories:

- **Driving Detection and Diagnosis:** Identifying the most critical problems across clinical settings and connecting the dots for clinicians, including the role of informatics.
- **Improving Treatment and Management of CIED Infection:** Making recommendations for enhancing systems of care.
- **Awareness and Education:** Learning from consumer and health care professional initiatives in other diseases.

Infections are a lifelong risk for patients with CIEDs, but prompt, expert, guideline-directed treatment can reduce the impact of infections on patients' lives. Quality improvement initiatives and care redesign programs can enhance the care that patients with CIEDs receive within health systems. These initiatives should build greater awareness among patients, caregivers and health care professionals of the risk of infection and the best ways to manage it; promote earlier detection and diagnosis of infection; encourage guideline-directed treatment and management; and establish measurement of and feedback on care performance.

## JOIN US ON THIS JOURNEY

Success depends on many groups working together to address the issue of CIED infection. For the full CIED Infection Summit proceedings report, go to [www.heart.org/CIEDInfectionReport](http://www.heart.org/CIEDInfectionReport). While there, complete the form to request updates and stay informed on this important topic. A special thank you to all the volunteers and [organizations](#) involved in the CIED Infection Summit.

## References

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