# Audit of the Management of Infections Related to Implantable Cardiac Electronic Devices in a Tertiary Hospital: A 5 year review

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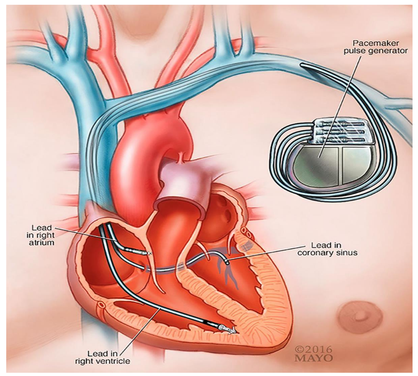
## Introduction

Although rare, infections related to Implantable Cardiac Electronic Devices (ICEDs) including pacemakers, implantable cardiac defibrillators and cardiac resynchronisation therapy devices are associated with significant morbidity and mortality. These devices usually consist of both intravascular and extravascular components and infection can involve the generator; device leads and/or endocardium in various combinations.



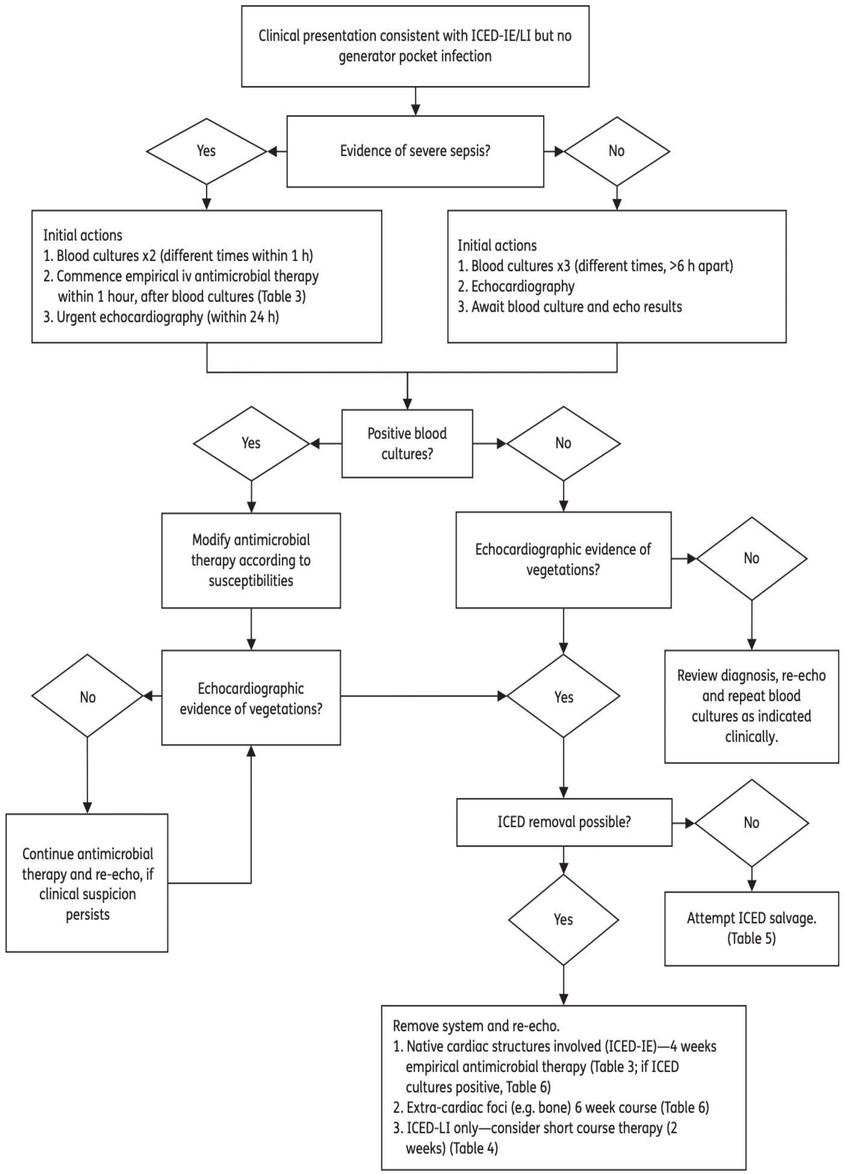

## Methods

Standards were identified by consulting the British Society for Antimicrobial Chemotherapy (BSAC) Guidelines for the diagnosis, prevention, and management of implantable cardiac electronic device infection.

A list of adult patients with ICED infections was generated by searching HIPE codes included in discharge summaries over five years from 2017-2022. Data was collected using a pro forma with a review of charts, microbiological result records and cardiac imaging. In addition, baseline characteristics and risk factors were recorded form the patient charts.

| N = 12 | |
|---|---|
| Sex (M/F) | 12/0 |
| Age (mean) | 65 |
| *Comorbidities:* | |
| Congestive Cardiac Failure | 7 |
| Diabetes Mellitus | 4 |
| Renal Failure | 3 |
| Anticoagulant use | 4 |
| *Site of infection:* | |
| Device pocket/generator | 1 |
| Device lead | 9 |
| Endocardium | 7 |
| Mean time from insertion to diagnosis of ICED (weeks) | 207 |
| Blood cultures drawn | 12 |
| *Organism Isolated:* | |
| *Staphylococcus aureus* | 4 |
| *Coagulase negative Staphylococcus* | 5 |
| *Methicillin resistant Staphylococcus aureus* | 1 |
| *Enterococcus faecalis* | 1 |
| Culture negative | 1 |
| *Device extraction rates:* | |
| Device removed | 5 |
| Device left in situ | 6 |
| Unknown | 1 |
| *Mean duration of antibiotics post extraction:* | |
| Lead infection only (days) | 24 |
| Endocarditis (days) | 42 |

## Management Algorithm




## Conclusion

The duration of antimicrobial therapy should be tailored to specific cases. The presence of generator, lead or endocardial infection determines the duration of treatment.

In our patient cohort, antibiotics were frequently continued beyond the recommended duration post device extraction for both isolated lead infection and infective endocarditis. A number of patients were unable to undergo device extraction due to underlying comorbidities. Infections related to ICEDs are often complex and difficult to manage, a multidisciplinary approach between specialties is needed.

It also would be useful to create a database to facilitate reaudit in the future.

**References**:

1. Sandoe, J.A. et al. (2014) 'Guidelines for the diagnosis, prevention and management of implantable cardiac electronic device infection. report of a Joint Working Party Project on behalf of the British Society for Antimicrobial Chemotherapy (BSAC, host organization), British heart rhythm society (BHRS), British Cardiovascular Society (BCS), British Heart Valve Society (BHVS) and British Society for Echocardiography (BSE)', Journal of Antimicrobial Chemotherapy, 70(2), pp. 325–359. doi:10.1093/jac/dku383.
2. DeSimone, D.C. and Sohail, M.R. (2018) 'Approach to diagnosis of cardiovascular implantable-electronic-device infection', Journal of Clinical Microbiology, 56(7). doi:10.1128/jcm.01683-17.