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BRIEF REPORT

Positron Emission Tomography/Computed Tomography in Cardiac Implantable Electronic Device Infections: Insights From the Emerging Infections Network

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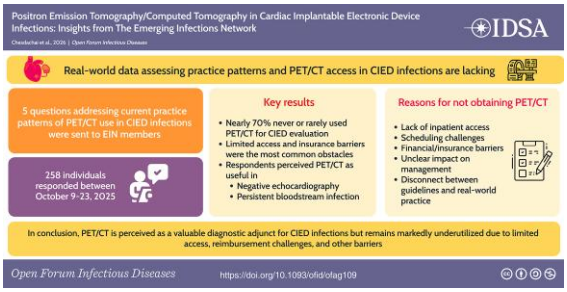
The practice patterns of fluorine 18–labeled fluorodeoxyglucose positron emission tomography/computed tomography ([^{18}F] FDG PET/CT) use in cardiac implantable electronic device infection remain undefined. Among 258 Emerging Infections Network respondents, 69% reported never or rarely using [^{18}F] FDG PET/CT. Limited access and insurance barriers were the most common obstacles.

Graphical abstract



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Keywords. accessibility; cardiac implantable electronic device infection; emerging infections network; perspective; positron emission tomography/computed tomography.

Diagnosing cardiac implantable electronic device (CIED) infections remains challenging. Diagnostic uncertainty may lead to either unnecessary device removal or retention of infected devices, and both of which are associated with adverse outcomes [1]. Fluorine 18–labeled fluorodeoxyglucose positron emission tomography/computed tomography ([^{18}F] FDG PET/CT) has emerged as a valuable tool to improve diagnostic accuracy and has been incorporated into major guidelines/scientific statement of the 2019 European Heart Rhythm Association CIED Infections Guideline, 2023 European Society of Cardiology Infective Endocarditis Guidelines, the 2024 American Heart Association (AHA) Scientific Statement on CIED Infection, and the American Society of Nuclear Cardiology Imaging Indications document (endorsed by the Infectious Diseases Society of America [IDSA]) [2–5]. Despite these endorsements, real-world data assessing [^{18}F] FDG PET/CT access and practice patterns are lacking. This study aims to characterize current practice patterns, barriers, and perceived impact of [^{18}F] FDG PET/CT use in CIED infections among members of the Emerging Infections Network (EIN). We hypothesized that access to [^{18}F] FDG PET/CT remains limited.

METHODS

The study utilized the IDSA EIN, a provider-based sentinel network supported by the Centers for Disease Control and Prevention (CDC) [6]. EIN members include infectious diseases (ID) physicians, other ID healthcare professionals with advanced degrees, and public health professionals who work in a federal, state or local public health departments.

Five questions addressing current practice patterns, potential barriers, and the perceived impact of [^{18}F] FDG PET/CT in the diagnosis and management of suspected CIED infections were developed by three ID physicians (SC, DCD, LMB) and subsequently refined in consultation with EIN leadership (SB and PP). This instrument was intentionally designed as a concise questionnaire to rapidly capture clinician perspectives on an emerging clinical issue, rather than as a formal, comprehensive survey. The complete questionnaire is provided in Supplementary Material 1.

The questionnaire was distributed to EIN members via electronic links sent through the EIN listserv emails on October 9,

15, and 21, 2025 as a request to complete online polls. Participation was voluntary and anonymous. Respondents were not required to answer every question, so denominators vary by question. The University of Iowa Institutional Review Board reviewed the study and granted it exempt status. Responses were summarized using descriptive statistics.

RESULTS

A total of 258 individuals responded between October 9 and 23 October 2025. Among respondents, 90 (35%) reported never using [^{18}F] FDG PET/CT in CIED infection evaluation, and 88 (34%) reported rare use (≤10% of cases). Only 7 (3%) reported very frequent use (more than 50% of cases) (Figure 1).

Barriers to Access

Of 256 respondents to this question (multiple responses allowed), 143 (56%) reported that they were unable to access [^{18}F] FDG PET/CT in a timely manner. Insurance coverage was the next most common barrier (102, 40%). Forty (16%) respondents believed that [^{18}F] FDG PET/CT results rarely altered management decisions.

Clinical Scenarios for [^{18}F] FDG PET/CT Use

Respondents were asked in which clinical situations they would consider obtaining [^{18}F] FDG PET/CT for suspected CIED infection. Among 252 respondents (multiple responses allowed), the most frequent indications were inconclusive or negative echocardiography (193, 76%) and persistent bloodstream infection without an identified source (187, 74%). Nearly half (122, 48%) used [^{18}F] FDG PET/CT when other prosthetic material was present, and 62 (25%) in *Staphylococcus aureus* bacteremia. Only 6 (2%) respondents felt [^{18}F] FDG PET/CT should never be used in any situation.

Influence of Current CIED Infection Guidelines/Scientific Statement

EIN members were specifically asked how strongly current recommendations regarding the use of [^{18}F] FDG PET/CT in recent guidelines or scientific statements influenced their clinical decision-making. Of the 252 respondents, 108 (43%) reported that existing guidelines had only a moderate influence on their decision, 20% strongly, and 5% very strongly. In contrast, 22% indicated only slight influence, and 10% reported no influence at all.

General Comments

A free-text box soliciting general comments (64 respondents) revealed several recurring themes. Most comments highlighted limited access to [^{18}F] FDG PET/CT due to insurance restrictions, cost barriers, and logistical or operational challenges. Although many respondents perceived clear clinical utility, they emphasized that guideline or scientific statements should account for these access limitations. A summary of these themes, along with examples of comments, is presented in Table 1, and all verbatim comments are provided in Supplementary Material 2.

DISCUSSION

A brief online questionnaire regarding the use of [^{18}F] FDG PET/CT in CIED infections yielded several notable observations. First, nearly 70% of respondents reported never or rarely using [^{18}F] FDG PET/CT for CIED evaluation despite guideline recommendations, primarily due to limited access and cost constraints. Second, most respondents viewed [^{18}F] FDG PET/CT as particularly useful in cases of inconclusive or negative echocardiography and in patients with persistent bloodstream infection. Third, several respondents expressed frustration with the disconnect between guidelines or scientific statement recommendations and real-world practice, which appeared to reflect structural, logistical, and reimbursement barriers rather than clinician non-adherence, given the substantial challenges in obtaining [^{18}F] FDG PET/CT in CIED infection.

To our knowledge, no population-based study has examined the rate of [^{18}F] FDG PET/CT utilization in patients with CIED infections; therefore, the true prevalence of [^{18}F] FDG PET/CT use in this setting remains unknown. The 2024 AHA Scientific Statement [4] incorporated [^{18}F] FDG PET/CT as an important imaging modality to consider and recommended early referral to centers with [^{18}F] FDG PET/CT availability. However, the Statement also acknowledged that when [^{18}F] FDG PET/CT was not feasible, clinical judgment and multidisciplinary evaluation remained essential. Recognizing these realities, the low utilization rate and the negative perceptions reported in our study are not surprising. Even though complete device removal is the cornerstone of CIED infection management, real-world extraction rates remain below 20% [7, 8]. In this context, respondents perceived that [^{18}F] FDG PET/CT may have limited incremental value when device explantation is unlikely to occur, which may influence clinician decision-making, rather than demonstrating a causal relationship between imaging use and management decisions.

[^{18}F] FDG PET/CT is a valuable tool for evaluating various types of cardiovascular device infections and demonstrates excellent sensitivity and specificity, and yet several challenges limit its use. Sayed et al [9]. analyzed 2021 Centers for Medicare and Medicaid Services data and documented substantial geographic disparities in access to cardiac [^{18}F] FDG PET/CT. In many states, patients were required to travel 100–300 miles to reach the nearest facility, and some states—including Montana, Rhode Island, West Virginia, and Wyoming—had no available cardiac [^{18}F] FDG PET/CT capability. In addition to logistical constraints, limited outcome-based evidence demonstrating that [^{18}F] FDG PET/CT changes management or

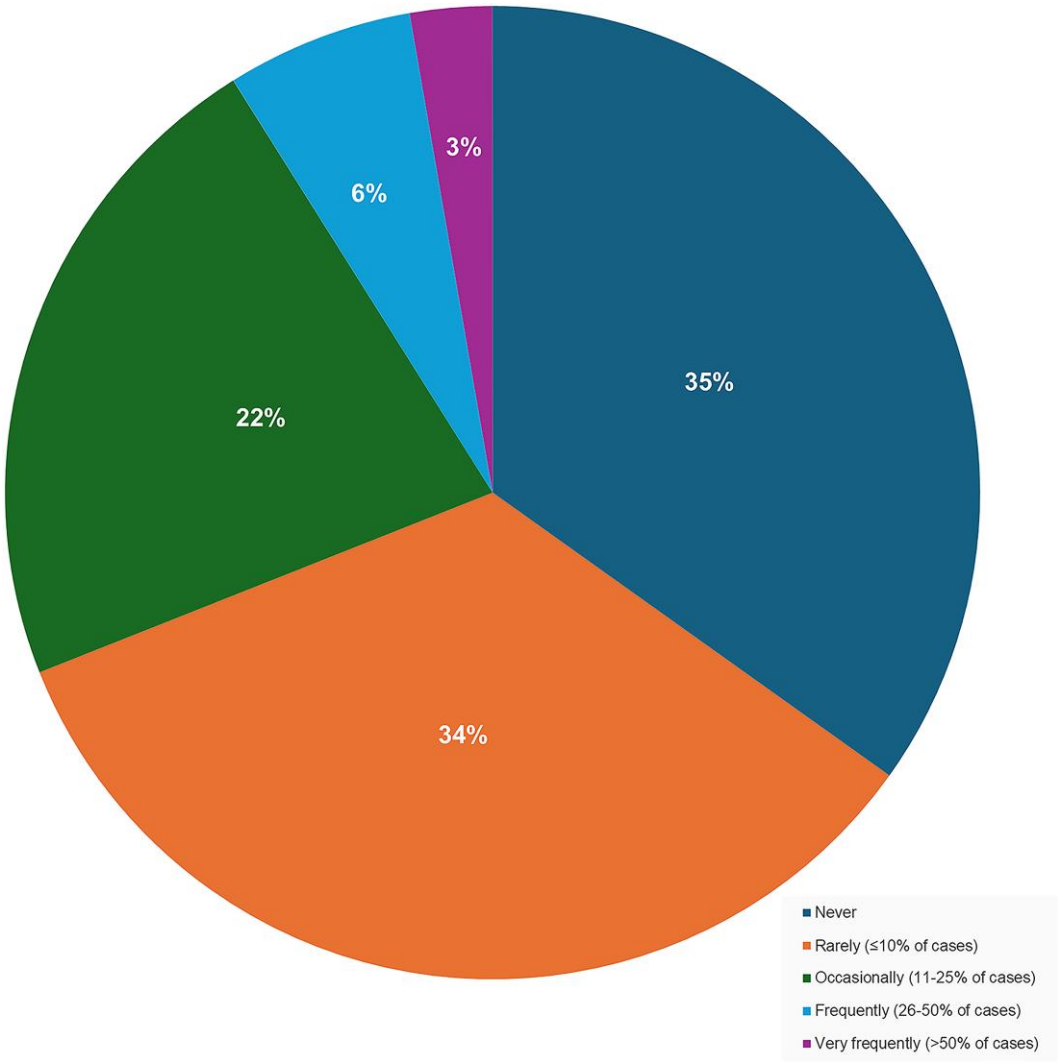

Figure 1. Frequency of [^{18}F] FDG PET/CT Use for Cardiac Implantable Electronic Device Infections. Among 258 respondents, nearly 70% reported never or rarely using [^{18}F] FDG PET/CT for CIED infection evaluation.

improves patient-centered outcomes may contribute to payer reluctance and restricted reimbursement.

Beyond geographic scarcity, reimbursement remains inconsistent across payers, leading to denials and protracted preauthorization processes. Inpatient access appears structurally limited. [^{18}F] FDG PET/CT performed during inpatient admissions is often reimbursed under bundled diagnosis-related group payments rather than as a separate billable study, creating a financial disincentive for hospitals to support routine inpatient [^{18}F] FDG PET/CT. These issues not only affect patients but also shape clinicians' perceptions of cost, feasibility, and potential impact on management when considering [^{18}F] FDG PET/CT, as reflected in several comments in this questionnaire. Additional barriers have been described, including competition for scanner time, with oncological indications receiving priority and limiting timely access for cardiac imaging, and lack of knowledge of the [^{18}F] FDG PET/CT indications and preparation protocol [10].

Although no prior study has specifically assessed perspectives on [^{18}F] FDG PET/CT for CIED infections, our work has several limitations. First, geographic location, demographic characteristics, and respondent subspecialty or role was not collected, limiting representativeness and generalizability. The responses may or may not have reflected practices in nonacademic or rural settings. Second, detailed specialty breakdown and institutional [^{18}F] FDG PET/CT availability metrics were not obtained. Third, the results are subject to response bias, particularly by providers with strong views or prior familiarity with [^{18}F] FDG PET/CT.

In conclusion, [^{18}F] FDG PET/CT is perceived as a valuable diagnostic adjunct for CIED infections but remains markedly underutilized due to limited access, reimbursement challenges,

Table 1. Summary of Key Quantitative Results and Representative Themes

Theme	Description	Example
Logistical barriers	Lack of inpatient access, ordering/scheduling challenges	*"Obtaining a PET inpatient in our hospital is essentially impossible,"* *"We have attempted numerous times to get PET/CT on these patients but it is very difficult to obtain on inpatients due to scheduling limitations."*
Financial/insurance barriers	Cost, non-reimbursement, insurance denial	*"I do not believe that commercial insurance or Medicare advantage plans will cover it,"* *"Insurance approval very difficult"*
Diagnostic value and evidence gaps	Unclear impact on management	*"Rarely expect it to give clear enough results to actually change management decisions,"* *"There is a distinct need for further research investigating how often adding FDG PET/CT to standard care changes clinical management or patient-centered outcomes in patients with suspected CIED infection."*
Guideline and implementation gaps	Disconnect between guidelines and real-world access	*"PET seems like an unrealistic test for most clinicians. While I follow the guidelines and respect the work that goes into making them, this is a reflection of the disconnect between the clinicians who shape guidelines and boots-on-the-ground ID clinicians in the community,"* *"I can't follow any guidelines for this imaging due to lack of inpatient access to this imaging."*

and other systemic barriers. Future prospective studies are needed to better define clinical indications and to assess the impact of [^{18}F] FDG PET/CT on management decisions (including device extraction), patient-centered outcomes, and cost-effectiveness, which may support broader insurance coverage and increase access. In the absence of data on actual [^{18}F] FDG PET/CT utilization after publishing of recent guidelines and scientific statement, this study provides qualitative insight into clinicians' attitudes and the system-level obstacles that hinder adoption—highlighting a striking contrast between the enthusiasm for [^{18}F] FDG PET/CT in academic discourse and its sparse use in real-world practice.

Supplementary Data

Supplementary materials are available at *Open Forum Infectious Diseases* online. Consisting of data provided by the authors to benefit the reader, the posted materials are not copyedited and are the sole responsibility of the authors, so questions or comments should be addressed to the corresponding author.

Notes

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Data availability statements. The data underlying this article will be shared on reasonable request to the corresponding author.

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