

Quality ID #393: Infection within 180 Days of Cardiac Implantable Electronic Device (CIED) Implantation, Replacement, or Revision

2026 COLLECTION TYPE:

MERIT-BASED INCENTIVE PAYMENT SYSTEM (MIPS) CLINICAL QUALITY MEASURE (CQM)

MEASURE TYPE:

Outcome – High Priority

- ***INVERSE MEASURE: LOWER SCORE – BETTER***

DESCRIPTION:

Infection rate following CIED device implantation, replacement, or revision.

INSTRUCTIONS:

Reporting Frequency:

This measure is to be submitted a minimum of once per performance period for denominator eligible cases as defined in the denominator criteria.

Intent and Clinician Applicability:

This measure is intended to reflect the quality of services provided for patients who undergo CIED device implantation, replacement, or revision. This measure may be submitted by Merit-based Incentive Payment System (MIPS) eligible clinicians who perform the quality actions described in the measure based on the services provided and the measure-specific denominator coding.

Measure Strata and Performance Rates:

This measure contains two strata defined by two submission criteria.

This measure produces a single performance rate using a weighted average.

There are 2 Submission Criteria for this measure:

- 1) Patients, regardless of age, with a new CIED
- 2) Patients, regardless of age, with a replaced or revised CIED

Additional submitting stratification categories may be useful; however, these stratifications are not required for purposes of QPP submission:

- Device class (e.g., pacemaker, ICD) and type (e.g., single chamber, dual chamber);
- Advanced renal disease (CKD stages 4 and 5, ESRD);
- Diabetes;
- CIED infection requiring device removal within 180 days prior to index CIED procedures; and
- CIED-related surgical procedure within 180 days prior to current CIED procedure.

Implementation Considerations:

For the purposes of MIPS implementation, this patient-process measure is submitted a minimum of once per patient for the performance period. The most advantageous QDC will be used if the measure is submitted more than once.

This is an inverse measure which means a lower calculated performance rate for this measure indicates better clinical care or control. The “Performance Not Met” numerator option for this measure is the representation of the better clinical quality or control. Submitting that numerator option will produce a performance rate that trends closer to 0%, as quality increases. For inverse measures, a rate of 100% means all of the denominator eligible patients did not receive the appropriate care or were not in proper control.

Include only patients that have had CIED implantation, replacement, or revision performed by **June 30, 2026**. This timeframe allows for evaluation of infection required within 180 days within the performance period. This will allow the evaluation of infection status post CIED implantation, replacement, or revision within the performance period.

Infection rates for new implants shall be calculated and submitted separately from device replacements and revisions. A new device would be either the first device OR a device implanted with new functionality.

Telehealth:

NOT TELEHEALTH ELIGIBLE: This measure **is not appropriate for nor applicable to the telehealth setting**. This measure is procedure based and therefore doesn't allow for the denominator criteria to be conducted via telehealth. It would be appropriate to remove these patients from the denominator eligible patient population. Telehealth eligibility is at the measure level for inclusion within the denominator eligible patient population and based on the measure specification definitions which are independent of changes to coding and/or billing practices.

Measure Submission:

The quality data codes listed do not need to be submitted by MIPS eligible clinicians, groups, or third party intermediaries that utilize this collection type for submissions; however, these codes may be submitted for those third party intermediaries that utilize Medicare Part B claims data. The coding provided to identify the measure criteria: Denominator or Numerator, may be an example of coding that could be used to identify patients that meet the intent of this clinical topic. When implementing this measure, please refer to the 'Reference Coding' section to determine if other codes or code languages that meet the intent of the criteria may also be used within the medical record to identify and/or assess patients. For more information regarding Application Programming Interface (API), please refer to the Quality Payment Program (QPP) website.

SUBMISSION CRITERIA 1: PATIENTS WITH A NEW CIED

DENOMINATOR (CRITERIA 1):

All patients with a new CIED from January 1, 2026, through June 30, 2026, of the performance period.

Definition:

CIEDs encompassed for this measure are the following devices:

- Pacemaker devices (single or dual chamber);
- Implantable cardioverter-defibrillators (ICDs, single or dual chamber);
- Cardiac resynchronization devices (pacemaker or ICD); and
- Implantable loop recorders (ILRs)

Denominator Criteria (Eligible Cases) 1:

All patients, regardless of age

AND

Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026, of the performance period (ICD-10-PCS): 0JH604Z, 0JH605Z, 0JH606Z, 0JH607Z, 0JH608Z, 0JH609Z, 0JH60PZ, 0JH634Z, 0JH635Z, 0JH636Z, 0JH637Z, 0JH638Z, 0JH639Z, 0JH63PZ, 0JH804Z, 0JH805Z, 0JH806Z, 0JH807Z, 0JH808Z, 0JH809Z, 0JH80PZ, 0JH834Z, 0JH835Z, 0JH836Z, 0JH837Z, 0JH838Z, 0JH83PZ, 0JPT0PZ, 0JPT3PZ, 0JWT0PZ, 0JWT3PZ

AND/OR

Patient encounter during performance period (CPT): 33202, 33203, 33206, 33207, 33208, 33212, 33213, 33214, 33215, 33216, 33217, 33218, 33220, 33221, 33222, 33223, 33224, 33226, 33227, 33228, 33229, 33240, 33249, 33262, 33263, 33264, 33270

AND

New CIED: M1454

AND NOT

DENOMINATOR EXCLUSION:

Patient had a heart transplant: M1456

Reference Coding:

Denominator Exclusion for Heart Transplant [M1456] is defined by the following coding **only** (ICD-10-PCS):
02YA0Z0, 02YA0Z1, 02YA0Z2

NUMERATOR (CRITERIA 1):

The number of patients from the denominator admitted with an infection requiring device removal or surgical revision within 180 days following CIED implantation, replacement, or revision.

Numerator Instructions:

INVERSE MEASURE – see **Implementation Considerations**

Numerator Options:

Performance Not Met:

Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision (**G9411**)

OR

Performance Met:

Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision (**G9410**)

OR

SUBMISSION CRITERIA 2: PATIENTS WITH A REPLACED OR REVISED CIED

DENOMINATOR (CRITERIA 2):

All patients with replacement or revision of a CIED from January 1, 2026, through June 30, 2026, of the performance period.

Definition:

CIEDs encompassed for this measure are the following devices:

- Pacemaker devices (single or dual chamber);
- Implantable cardioverter-defibrillators (ICDs, single or dual chamber);
- Cardiac resynchronization devices (pacemaker or ICD); and
- Implantable loop recorders (ILRs)

Denominator Criteria (Eligible Cases) 2:

All patients, regardless of age

AND

Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026, of the performance period (ICD-10-PCS): OJH604Z, OJH605Z, OJH606Z, OJH607Z, OJH608Z, OJH609Z, OJH60PZ, OJH634Z, OJH635Z, OJH636Z, OJH637Z, OJH638Z, OJH639Z, OJH63PZ, OJH804Z, OJH805Z, OJH806Z, OJH807Z, OJH808Z, OJH809Z, OJH80PZ, OJH834Z, OJH835Z, OJH836Z, OJH837Z, OJH838Z, OJH83PZ, OJPT0PZ, OJPT3PZ, OJWT0PZ, OJWT3PZ

AND/OR

Patient encounter during performance period (CPT): 33202, 33203, 33206, 33207, 33208, 33212, 33213, 33214, 33215, 33216, 33217, 33218, 33220, 33221, 33222, 33223, 33224, 33226, 33227, 33228, 33229, 33240, 33249, 33262, 33263, 33264, 33270

AND

Replaced or revised CIED: M1455

AND NOT

DENOMINATOR EXCLUSION:

Patient had a heart transplant: M1456

Reference Coding:

Denominator Exclusion for Heart Transplant [M1456] is defined by the following coding **only** (ICD-10-PCS):
02YA0Z0, 02YA0Z1, 02YA0Z2

NUMERATOR (CRITERIA 2):

The number of patients from the denominator admitted with an infection requiring device removal or surgical revision within 180 days following CIED implantation, replacement, or revision.

Numerator Instructions:

INVERSE MEASURE – see Implementation Considerations

Numerator Options:

Performance Not Met:

Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision (**G9413**)

OR

Performance Met:

Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision (**G9412**)

RATIONALE:

The rate of implantable cardioverter-defibrillator (ICD) infections has been increasing faster than that of device implantation and is associated with substantial morbidity, mortality, and financial cost. A recent study including over 200,000 ICD implant patients found 2 percent of patients undergoing ICD implantation experienced a device-related infection. Patients who developed an ICD infection were likely to have more comorbidity burden, warfarin use, coronary sinus lead, device upgrade/malfunction as the last surgery, peri-ICD implant complications, and non-EP trained operator. The evidence demonstrates the need to measure performance in this area.

CLINICAL RECOMMENDATION STATEMENTS:

In recognition that there is an absence of applicable physician-level performance measures for the profession of cardiac electrophysiology, the Heart Rhythm Society (the international professional society focused on the care of patients with heart rhythm disorders) convened a Performance Measures Development Task Force to consider and develop potential physician-level measures for cardiac electrophysiologists. The task force consisted of thought leaders in 1) implantation of cardiac implantable electronic devices (CIEDs) including pacemakers, implantable cardioverter defibrillators (ICDs), cardiac resynchronization devices (pacemaker or ICD), and implantable loop recorders (ILRs); 2) cardiovascular health policy; 3) performance measures development; 4) clinical outcomes; and 5) population science.

The process for consideration of the evidence included review of the relevant literature referenced within this document and in the knowledge of the members of the task force (Voigt et al, 2006; Cabell et al, 2004; Voigt et al, 2010; Greenspon et al, 2011; Sohail et al, 2011; Nery et al, 2010; Ferguson et al, 1996; Uslan et al, 2007; Lee et al, 2010; Klug et al, 2007; Alter et al, 2005; Al-Khatib et al, 2008; de Oliveira et al, 2009; Uslan et al, 2011; Borleffs et al, 2010; Sohail et al, 2007; Bloom et al, 2006; Baddour et al, 2010; Le KY et al, 2011; Johansen et al, 2011; Al-Khatib et al, 2005; Tarakji et al, 2010).

The number of CIED-related infections in the United States continues to increase out of proportion to the increase in the CIED implantation rates (Voigt et al, 2006; Cabell et al, 2004; Voigt et al, 2010). This infection burden is associated with increased mortality, prolonged hospital stays, and high financial costs (Greenspon et al, 2011; Sohail et al, 2011; Ferguson et al, 1996). Collectively, the incidence of CIED infection has ranged from 0.3 to 2.9% across the literature evaluated (Greenspon et al, 2011; Sohail et al, 2011; Nery et al, 2010; Uslan et al, 2007; Lee et al, 2010; Klug et al, 2007; Alter et al, 2005; Al-Khatib et al, 2008; Uslan et al, 2011; Bloom et al, 2006; Baddour et al, 2010; Johansen et al, 2011). In the vast majority of patients, CIED infection is preventable, and an association between a higher volume of ICD implants and a lower rate of infections has been demonstrated (Tarakji et al, 2010). This is why a performance measure that could lower

the risk of CIED infection is critically needed.

REFERENCES:

Cabell, C. H., Heidenreich, P. A., Chu, V. H., et al. (2004). Increasing rates of cardiac device infections among Medicare beneficiaries: 1990–1999. *American Heart Journal*, 147(4), 582–586.

Greenspon, A. J., Patel, J. D., Lau, E., Ochoa, J. A., Frisch, D. R., Ho, R. T., Pavri, B. B., & Kurtz, S. M. (2011). 16-year trends in the infection burden for pacemakers and implantable cardioverter-defibrillators in the United States 1993 to 2008. *Journal of the American College of Cardiology*, 58(10), 1001–1006. <https://doi.org/10.1016/j.jacc.2011.04.033>

Sohail, M. R., Henrikson, C. A., Braid-Forbes, M. J., Forbes, K. F., & Lerner, D. J. (2011). Mortality and cost associated with cardiovascular implantable electronic device infections. *Archives of Internal Medicine*, 171(20), 1821–1828. <https://doi.org/10.1001/archinternmed.2011.441>

Sohail, M. R., Uslan, D. Z., Khan, A. H., et al. (2007). Management and outcome of permanent pacemaker and implantable cardioverter-defibrillator infections. *Journal of the American College of Cardiology*, 49(18), 1851–1859.

Voigt, A., Shalaby, A., & Saba, S. (2010). Continued rise in rates of cardiovascular implantable electronic device infections in the United States: Temporal trends and causative insights. *Pacing and Clinical Electrophysiology*, 33(4), 414–419. <https://doi.org/10.1111/j.1540-8159.2009.02569.x>

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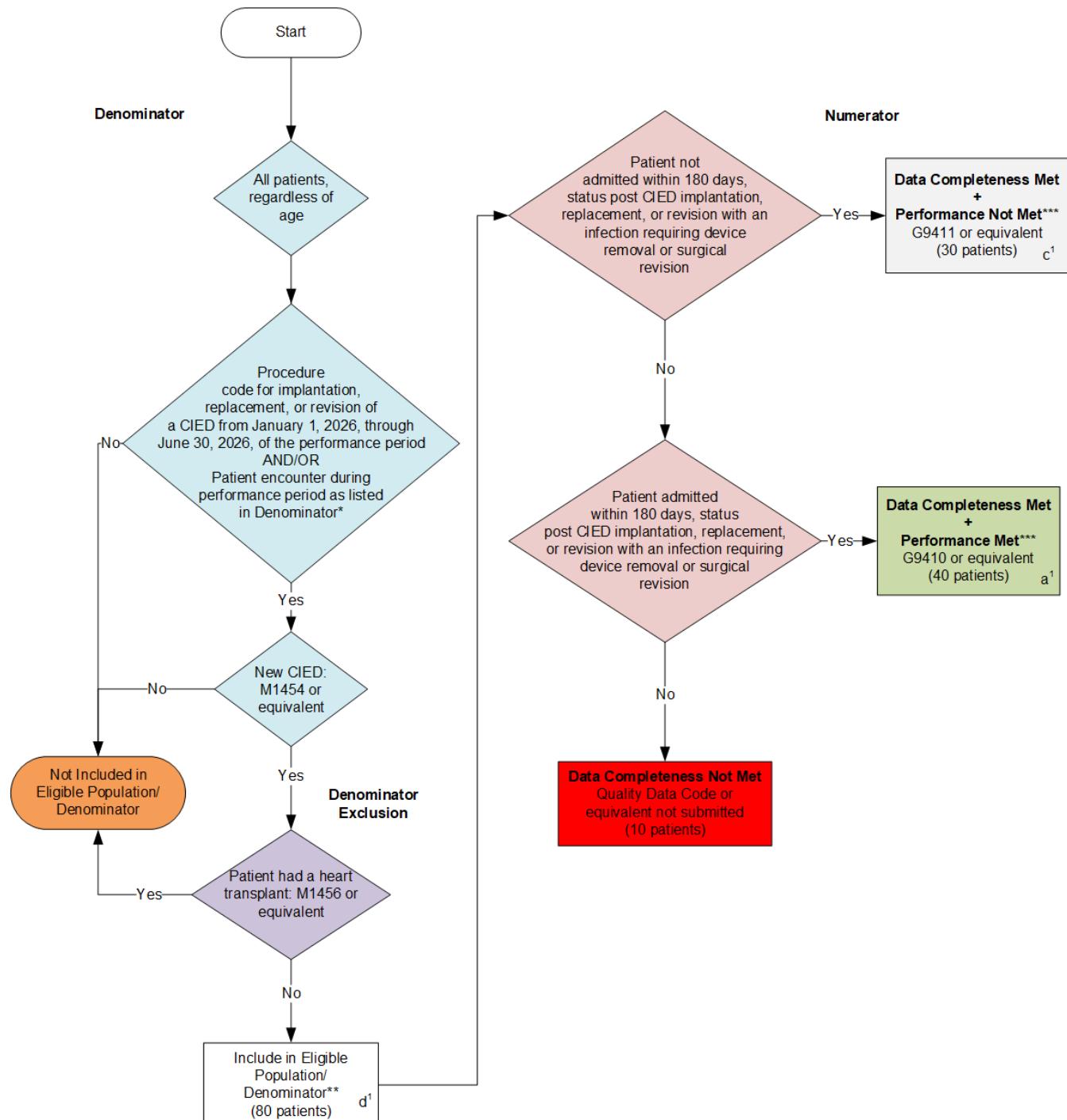
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**2026 Clinical Quality Measure Flow for Quality ID #393:
Infection within 180 Days of Cardiac Implantable Electronic Device (CIED)
Implantation, Replacement, or Revision**

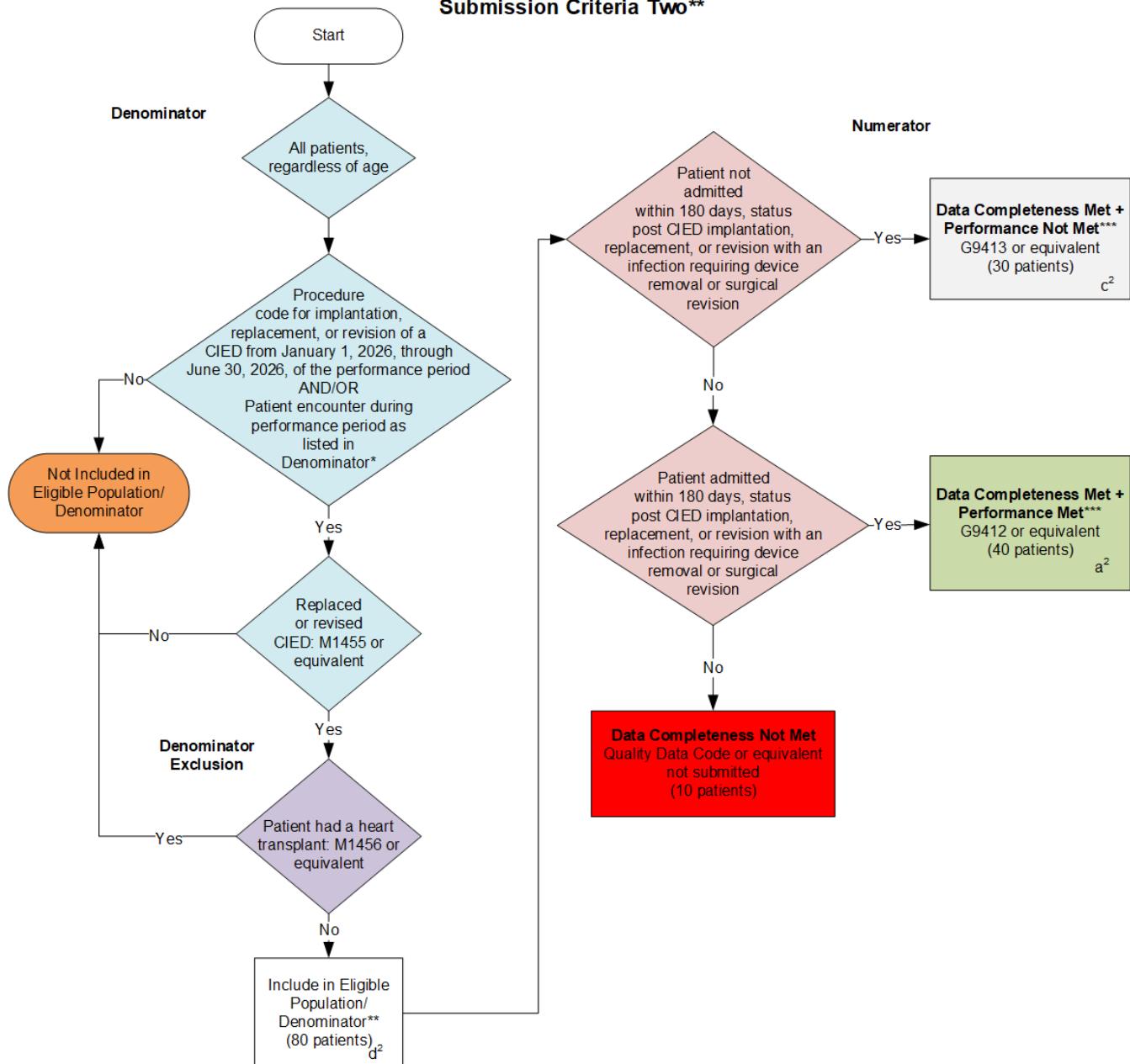
INVERSE MEASURE: LOWER SCORE – BETTER

Disclaimer: Refer to the measure specification for specific coding and instructions to submit this measure.

Submission Criteria One



Submission Criteria Two**



SAMPLE CALCULATIONS

Data Completeness=

$$\frac{\text{Performance Not Met } (c^1+c^2=60 \text{ patients}) + \text{Performance Met } (a^1+a^2=80 \text{ patients})}{\text{Eligible Population / Denominator } (d^1+d^2=160 \text{ patients})} = \frac{140 \text{ patients}}{160 \text{ patients}} = 87.50\%$$

Performance Rate***=

$$\frac{\text{Performance Met } (a^1+a^2=80 \text{ patients})}{\text{Data Completeness Numerator } (140 \text{ patients})} = \frac{80 \text{ patients}}{140 \text{ patients}} = 57.14\%$$

*See the posted measure specification for specific coding and instructions to submit this measure.

This measure flow illustrates denominator eligible encounters as requiring a ICD-10-PCS AND/OR an encounter.

The measurement period is for patients with a CIED device implantation, replacement, or revision performed from January 1, 2026 through June 30, 2026 of the performance period.

**This measure has two Submission Criteria that are combined for calculation of one data completeness and one performance rate.

***A lower calculated performance rate for this measure indicates better clinical care or control.

NOTE: Submission Frequency: Patient-Process

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**2026 Clinical Quality Measure Flow Narrative for Quality ID #393:
Infection within 180 Days of Cardiac Implantable Electronic
Device (CIED) Implantation, Replacement, or Revision**

INVERSE MEASURE: LOWER SCORE – BETTER

Disclaimer: Refer to the measure specification for specific coding and instructions to submit this measure.

Submission Criteria One:**

1. Start with Denominator
2. *All patients, regardless of age*
3. Check *Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026, of the performance period AND/OR Patient encounter during performance period as listed in Denominator**:
 - a. If *Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026, of the performance period AND/OR Patient encounter during performance period as listed in Denominator** equals No, do not include in *Eligible Population/Denominator*. Stop processing.
 - b. If *Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026, of the performance period AND/OR Patient encounter during performance period as listed in Denominator** equals Yes, proceed to check *Telehealth Modifier as listed in Denominator**.
4. Check *New CIED*:
 - a. If *New CIED* equals No, do not include in *Eligible Population/Denominator*. Stop processing.
 - b. If *New CIED* equals Yes, proceed to check *Procedure code for heart transplantation as listed in Denominator**.
5. Check *Procedure code patient had a heart transplant as listed in Denominator**:
 - a. If *Procedure code for heart transplantation as listed in Denominator** equals Yes, do not include in *Eligible Population/Denominator*. Stop processing.
 - b. If *Procedure code for heart transplantation as listed in Denominator** equals No, include in *Eligible Population/Denominator*.
6. Denominator Population:
 - Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d^1 equals 80 patients in the Sample Calculation.
7. Start Numerator
8. Check *Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision*:
 - a. If *Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals Yes, include in *Data Completeness Met and Performance Not Met****.

- *Data Completeness Met and Performance Not Met**** letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c¹ equals 30 patients in the Sample Calculation.

b. If Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision equals No, proceed to check Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision.

9. Check *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision*:

- a. If *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals Yes, include in *Data Completeness Met and Performance Met****.
 - *Data Completeness Met and Performance Met**** letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a¹ equals 40 patients in the Sample Calculation.
- b. If *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals No, proceed to check Data Completeness Not Met

10. Check *Data Completeness Not Met*:

- If *Data Completeness Not Met*, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

Submission Criteria Two**:

1. Start with Denominator
2. *All patients, regardless of age*
3. Check *Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026 of the performance period AND/OR Patient encounter during performance period as listed in Denominator**:
 - a. If *Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026 of the performance period AND/OR Patient encounter during performance period as listed in Denominator** equals No, do not include in *Eligible Population/Denominator*. Stop processing.
 - b. If *Procedure code for implantation, replacement, or revision of a CIED from January 1, 2026, through June 30, 2026 of the performance period AND/OR Patient encounter during performance period as listed in Denominator** equals Yes, proceed to check *Telehealth Modifier as listed in Denominator**.
4. Check *Replaced or revised CIED*:
 - a. If *Replaced or revised CIED* equals No, do not include in *Eligible Population/Denominator*. Stop processing.
 - b. If *Replaced or revised CIED* equals Yes, proceed to check *Procedure code for heart*

transplantation as listed in Denominator.*

5. Check *Procedure code patient had heart transplant as listed in Denominator**:
 - a. If *Procedure code for heart transplantation as listed in Denominator** equals Yes, do not include in *Eligible Population/Denominator*. Stop processing.
 - b. If *Procedure code for heart transplantation as listed in Denominator** equals No, include in *Eligible Population/Denominator*.
6. Denominator Population:
 - Denominator Population is all Eligible Patients in the Denominator. Denominator is represented as Denominator in the Sample Calculation listed at the end of this document. Letter d^2 equals 80 patients in the Sample Calculation.
7. Start Numerator
8. Check *Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision*:
 - a. If *Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals Yes, include in *Data Completeness Met and Performance Not Met****.
 - *Data Completeness Met and Performance Not Met**** letter is represented in the Data Completeness in the Sample Calculation listed at the end of this document. Letter c^2 equals 30 patients in the Sample Calculation.
 - b. If *Patient not admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals No, proceed to check *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision*.
9. Check *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision*:
 - a. If *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals Yes, include in *Data Completeness Met and Performance Met****.
 - *Data Completeness Met and Performance Met**** letter is represented in the Data Completeness and Performance Rate in the Sample Calculation listed at the end of this document. Letter a^2 equals 40 patients in the Sample Calculation.
 - b. If *Patient admitted within 180 days, status post CIED implantation, replacement, or revision with an infection requiring device removal or surgical revision* equals No, proceed to check *Data Completeness Not Met*.
10. Check *Data Completeness Not Met*:
 - If *Data Completeness Not Met*, the Quality Data Code or equivalent was not submitted. 10 patients have been subtracted from the Data Completeness Numerator in the Sample Calculation.

Sample Calculations

Data Completeness equals Performance Not Met (c^1 plus c^2 equals 60 patients) plus Performance Met (a^1 plus a^2 equals 80 patients) divided by Eligible Population/Denominator (d^1 plus d^2 equals 160 patients). All equals 140 patients divided by 160 patients. All equals 87.50 percent.

Performance Rate*** equals Performance Met (a^1 plus a^2 equals 80 patients) divided by Data Completeness Numerator (140 patients). All equals 80 patients divided by 140 patients. All equals 57.14 percent.

*See the posted measure specification for specific coding and instructions to submit this measure.

This measure flow illustrates denominator eligible encounters as requiring a ICD-10-PCS AND/OR an encounter.

The measurement period is for patients with a CIED device implantation, replacement, or revision performed from January 1, 2026 through June 30, 2026 of the performance period.

**This measure has two Submission Criteria that are combined for calculation of one data completeness and one performance rate.

***A lower calculated performance rate for this measure indicates better clinical care or control.

NOTE: Submission Frequency: Patient-Process

The measure diagrams were developed by CMS as a supplemental resource to be used in conjunction with the measure specifications. They should not be used alone or as a substitution for the measure specification.