



CLINICAL GUIDELINES

Cardiac Implantable Devices (CID)

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EviCore

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EviCore healthcare Clinical Decision Support Tool Diagnostic Strategies: This tool addresses common symptoms and symptom complexes. Imaging requests for individuals with atypical symptoms or clinical presentations that are not specifically addressed will require physician review. Consultation with the referring physician, specialist, and/or individual's Primary Care Physician (PCP) may provide additional insight.

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General Information

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General Guidelines (CRID-1.0)

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Terms used in this guideline

Abbreviations

ACE inhibitor	Angiotensin-converting enzyme inhibitor
AMI	Acute myocardial infarction
ARVC	Arrhythmogenic right ventricular cardiomyopathy
AV	Atrioventricular
CC	Complications/comorbid conditions
CHF	Congestive heart failure
CM	Cardiomyopathy
CRT	Cardiac resynchronization therapy
EP	Electrophysiology
GDMT	Guideline-directed medical therapy
HCM	Hypertrophic cardiomyopathy
HFpEF	Heart Failure with Preserved Ejection Fraction
HFReF	Heart Failure with Reduced Ejection Fraction
HV Interval	His-ventricular Interval
ICD	Implantable cardioverter defibrillator

LBBB	Left bundle branch block
LQT	Long QT syndrome
LV	Left ventricle
LVEF	Left ventricular ejection fraction
MCC	Major complications/comorbid conditions
MI	Myocardial infarction
NCCM	Non-compaction cardiomyopathy
NYHA	New York Heart Association functional classification
OMT	Optimal medical therapy
RBBB	Right bundle branch block
RV	Right ventricle
SCA/SCD	Sudden cardiac arrest/Sudden cardiac death
TAVI	Transcatheter aortic valve implantation
TAVR	Transcatheter aortic valve replacement
VF	Ventricular fibrillation
VT	Ventricular tachycardia

Definitions

NYHA Heart Failure Definitions

class I - No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, or dyspnea.

class II - Slight limitation of physical activity. Comfortable at rest. Ordinary physical activity results in fatigue, palpitation, or dyspnea.

class III - Marked limitation of physical activity. Comfortable at rest. Less than ordinary activity causes fatigue, palpitation, or dyspnea.

class IV - Unable to carry on any physical activity without discomfort. Symptoms of heart failure may be present even at rest. If any physical activity is undertaken, discomfort is increased.

Abnormal blood pressure response to exercise

Flat response/failure to augment; rise then fall during exercise; vasoactive cardiovascular drugs may result in an abnormal blood pressure response to exercise

Ambulatory class IV CHF

Class IV heart failure with: 1) no active acute coronary syndrome; 2) no inotropes; and 3) on OMT

Cardiomyopathy

A disease that affects the heart muscle, making it harder for the heart to pump blood to the rest of the body. It is further defined based on the type of change in the heart muscle including:

- hypertrophic - muscle becomes thicker
- dilated - muscle becomes weaker and stretched out
- nondilated - muscle develops scarring or abnormal tissue
- restrictive - muscle becomes stiff and less flexible

Hypertrophic cardiomyopathy

Hypertrophic Cardiomyopathy (HCM) is a clinical diagnosis, established by imaging with 2D echocardiography or cardiovascular magnetic resonance (CMR) showing a maximal end-diastolic wall thickness of ≥ 15 mm anywhere in the left ventricle, in the absence of another cause of hypertrophy in adults. More limited hypertrophy (13–14 mm) can be diagnostic, particularly when present in family members of a patient with HCM or in conjunction with a positive genetic test, and/or associated with typical dynamic outflow obstruction, or distinctly abnormal ECG patterns.

Incessant VT

Frequent recurrences of ongoing hemodynamically stable VT

Ischemic Cardiomyopathy

Decreased ability of the heart to pump blood properly caused by damage or scarring of the heart muscle from reduced blood supply to the heart (i.e., myocardial infarction or coronary artery disease)

Long QT Syndrome (LQTS)

A congenital disorder characterized by a prolongation of the QT interval on ECG and a propensity to ventricular tachyarrhythmias, which may lead to syncope, cardiac arrest, or sudden death.

The QT interval on the ECG, measured from the beginning of the QRS complex to the end of the T wave, represents the duration of activation and recovery of the ventricular myocardium. QT intervals corrected for heart rate (QTc) longer than 0.44 seconds are generally considered abnormal, though a normal QTc can be more prolonged in females (up to 0.46 sec). The Bazett formula is the formula most commonly used to calculate the QTc, as follows: $QTc = QT / \sqrt{RR}$ (in seconds).

Non-Compaction Cardiomyopathy

A rare congenital cardiomyopathy that affects children and adults. It results from the failure of myocardial development during embryogenesis. It is also called spongiform cardiomyopathy. Symptoms are often a result of a poor pumping performance by the heart. The disease can be associated with other problems with the heart and the body.

Non-Sustained Ventricular Tachycardia (NSVT)

Three or more consecutive ventricular beats at a rate of greater than 120 beats/min with a duration of less than 30 seconds

Nonischemic Cardiomyopathy

Decreased ability of the heart to pump blood properly not caused by coronary artery disease or ischemic injury

Optimal Medical Therapy (OMT)

Optimal medical therapy for heart failure includes 3 months of **all** of the following:

- Beta-blocker
- Mineralocorticoid antagonist (MRA)
- One of the following:
 - ACE inhibitor
 - angiotensin II receptor blocker
 - angiotensin receptor-neprilysin inhibitor

Note:

SGLT2i treatment improves prognosis in heart failure. Due to concerns over patient access, cost, and patient tolerance, although recommended for heart failure, the use is not mandatory to meet OMT. If OMT is not tolerated due to documented adverse effects (hypotension, renal dysfunction, or electrolyte imbalances) this does not preclude ICD eligibility.

Structural Heart Disease

A structural or functional abnormality of the heart, or of the blood vessels supplying the heart, that impairs its normal functioning.

Sudden Cardiac Arrest (SCA)

The abrupt loss of all heart activity

TAVR (TAVI)

A minimally invasive procedure to treat aortic valve stenosis

Wolff-Parkinson-White (WPW) syndrome

A cardiac condition where an accessory pathway allows electrical conduction between the heart chambers outside of the normal AV node route and creates a re-entry circuit, which can lead to supraventricular tachycardia (SVT), atrial fibrillation (AF), ventricular fibrillation (VF), and sudden cardiac death.

Health Equity Consideration

Health equity is the highest level of health for all individuals; health inequity is the avoidable difference in health status or distribution of health resources due to the social conditions in which individuals are born, grow, live, work, and age. Social determinants of health are the conditions in the environment that affect a wide range of health, functioning, and quality of life outcomes and risks. Examples include the following: safe housing, transportation, and neighborhoods; racism, discrimination, and violence; education, job opportunities, and income; access to nutritious foods and physical activity opportunities; access to clean air and water; and language and literacy skills.

General requirements

Current clinical information, which may include history, physical examination, symptoms, laboratory results, and imaging reports, are necessary for determining the medical necessity of implantable cardiac devices.

- The information provided should have clinical relevance to the request.
- If the information provided makes no reference to the potential indication for the request, then the medical necessity for the procedure(s) cannot be supported.
- Requests for a device when a same or similar device has already been placed is not supported without clear documentation that fulfills guideline criteria.

Procedures should be requested after initial consultation and physician treatment planning that includes full counseling of the individual with shared decision-making.

Removal and replacement (CRID-1.2)

- Generator replacement (CPT® 33212, 33213, 33221, 33227, 33228, 33229, 33230, 33231, 33240, 33262, 33263, 33264, 0614T, 0801T, 0802T, 0803T) with a same or similar device is medically necessary when:
 - Interrogation shows device is nearing Elective Replacement Indicator (ERI) or End of Life (EOL).
 - Interrogation report documents the device is not functioning correctly and requires replacement.

Evidence Discussion

The decision to replace a cardiac implantable device at elective replacement indicator is shared between the individual with the implanted device and the treating physician. Because clinical situations may change, indications should be reconsidered based on the most recent guidelines to evaluate for continuance of therapy or changing the type of device. For example, currently, there insufficient data regarding ICD replacement in

individuals who have received a primary prevention ICD, but have not experienced a clinically relevant arrhythmia since the device was placed (Russo et al. 2023). Clinical situations and an individuals understanding of their options may change. It is essential in the shared-decision process to ensure the individual is aware of any change in clinical status or change in evidence that may impact the decision to replace a cardiac device.

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Procedure Codes Addressed in this Guideline

CID.AD.101.A

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Procedure description	CPT®
Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial	33206
Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); ventricular	33207
Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial and ventricular	33208
Insertion of pacemaker pulse generator only; single existing single lead	33212
Insertion of pacemaker pulse generator only; with existing dual leads	33213
Upgrade of implanted pacemaker system, conversion of single chamber system to dual chamber system (includes removal of previously placed pulse generator, testing of existing lead, insertion of new lead, insertion of new pulse generator)	33214
Insertion of pacemaker pulse generator only; with existing multiple leads	33221
Insertion of pacing electrode, cardiac venous system, for left ventricular pacing, with attachment to previously placed pacemaker or pacing cardioverter-defibrillator pulse generator	33224
Insertion of pacing electrode, cardiac venous system, for left ventricular pacing, at time of insertion of pacing cardioverter-defibrillator pulse generator (including upgrade to dual chamber system and pocket revision)	33225
Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; single lead system	33227
Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; dual lead system	33228
Removal of permanent pacemaker pulse generator with replacement of pacemaker pulse generator; multiple lead system	33229

Procedure description	CPT®
Insertion of pacing cardioverter-defibrillator pulse generator only; with existing dual leads	33230
Insertion of pacing cardioverter-defibrillator pulse generator only; with existing multiple leads	33231
Insertion of pacing cardioverter-defibrillator pulse generator only; with existing single leads	33240
Insertion or replacement of permanent pacing cardioverter-defibrillator system with transvenous lead(s), single or dual chamber	33249
Removal of pacing cardioverter-defibrillator pulse generator with replacement of pacing cardioverter-defibrillator pulse generator; single lead system	33262
Removal of pacing cardioverter-defibrillator pulse generator with replacement of pacing cardioverter-defibrillator pulse generator; dual lead system	33263
Removal of pacing cardioverter-defibrillator pulse generator with replacement of pacing cardioverter-defibrillator pulse generator; multiple lead system	33264
Insertion or replacement of permanent subcutaneous implantable defibrillator system, with subcutaneous electrode, including defibrillation threshold evaluation, induction of arrhythmia, evaluation of sensing for arrhythmia termination, and programming or reprogramming of sensing or therapeutic parameters when performed	33270
Transcatheter insertion or replacement of permanent leadless pacemaker, right ventricular, including imaging guidance (e.g., fluoroscopy, venous ultrasound, ventriculography, femoral venography) and device evaluation (e.g., interrogation or programming), when performed	33274
Transcatheter implantation of wireless pulmonary artery pressure sensor for long-term hemodynamic monitoring, including deployment and calibration of the sensor, right heart catheterization, selective pulmonary catheterization, radiological supervision and interpretation, and pulmonary artery angiography, when performed	33289

Procedure description	CPT®
Initial open implantation of baroreflex activation therapy (BAT) modulation system, including lead placement onto the carotid sinus, lead tunneling, connection to a pulse generator placed in a distant subcutaneous pocket (ie, total system), and intraoperative interrogation and programming	64654
Insertion or replacement of permanent cardiac contractility modulation system, including contractility evaluation when performed, and programming of sensing and therapeutic parameters; pulse generator with transvenous electrodes	0408T
Insertion or replacement of permanent cardiac contractility modulation system, including contractility evaluation when performed, and programming of sensing and therapeutic parameters; pulse generator only	0409T
Insertion of wireless cardiac stimulator for left ventricular pacing, including device interrogation and programming, and imaging supervision and interpretation, when performed; complete system (includes electrode and generator [transmitter and battery])	0515T
Insertion of wireless cardiac stimulator for left ventricular pacing, including device interrogation and programming, and imaging supervision and interpretation, when performed; electrode only	0516T
Insertion of wireless cardiac stimulator for left ventricular pacing, including device interrogation and programming, and imaging supervision and interpretation, when performed; pulse generator component(s) (battery and/or transmitter) only	0517T
Removal and replacement of wireless cardiac stimulator for left ventricular pacing; pulse generator component(s) (battery and/or transmitter)	0519T
Removal and replacement of wireless cardiac stimulator for left ventricular pacing; pulse generator component(s) (battery and/or transmitter), including placement of a new electrode	0520T
Insertion or replacement of implantable cardioverter-defibrillator system with substernal electrode(s), including all imaging guidance and electrophysiological evaluation (includes defibrillation threshold evaluation, induction of arrhythmia, evaluation of sensing for arrhythmia termination, and programming or reprogramming of sensing or therapeutic parameters), when performed	0571T

Procedure description	CPT®
Removal and replacement of substernal implantable defibrillator pulse generator	0614T
Transcatheter insertion of permanent dual-chamber leadless pacemaker, including imaging guidance (e.g., fluoroscopy, venous ultrasound, right atrial angiography, right ventriculography, femoral venography) and device evaluation (e.g., interrogation or programming), when performed; complete system (i.e., right atrial and right ventricular pacemaker components)	0795T
Transcatheter insertion of right atrial pacemaker component (when an existing right ventricular single leadless pacemaker exists to create a dual-chamber leadless pacemaker system)	0796T
Transcatheter insertion of right ventricular pacemaker component (when part of a dual-chamber leadless pacemaker system)	0797T
Transcatheter removal and replacement of permanent dual-chamber leadless pacemaker, including imaging guidance (e.g., fluoroscopy, venous ultrasound, right atrial angiography, right ventriculography, femoral venography) and device evaluation (e.g., interrogation or programming), when performed; dual-chamber system (i.e., right atrial and right ventricular pacemaker components)	0801T
Transcatheter removal and replacement of right atrial pacemaker component	0802T
Transcatheter removal and replacement of right ventricular pacemaker component (when part of a dual-chamber leadless pacemaker system)	0803T
Transcatheter insertion of permanent single-chamber leadless pacemaker, right atrial, including imaging guidance (e.g., fluoroscopy, venous ultrasound, right atrial angiography and/or right ventriculography, femoral venography, cavography) and device evaluation (e.g., interrogation or programming), when performed	0823T
Transcatheter removal and replacement of permanent single-chamber leadless pacemaker, right atrial, including imaging guidance (e.g., fluoroscopy, venous ultrasound, right atrial angiography and/or right ventriculography, femoral venography, cavography) and device evaluation (e.g., interrogation or programming), when performed	0825T

Procedure description	CPT®
Insertion of permanent cardiac contractility modulation-defibrillation system component(s), including fluoroscopic guidance, and evaluation and programming of sensing and therapeutic parameters; pulse generator and dual transvenous electrodes/leads (pacing and defibrillation)	0915T
Insertion of permanent cardiac contractility modulation-defibrillation system component pulse generator only	0916T
Removal and replacement of permanent cardiac contractility modulation defibrillation pulse generator only	0923T
Transcatheter implantation of wireless left atrial pressure sensor for long-term left atrial pressure monitoring, including sensor calibration and deployment, right heart catheterization, transseptal puncture, imaging guidance, and radiological supervision and interpretation	0933T

Pacemaker Devices

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Permanent Pacemaker Implantation (CRID-7)

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Codes included

Description	CPT®
Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial	33206
Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); ventricular	33207
Insertion of new or replacement of permanent pacemaker with transvenous electrode(s); atrial and ventricular	33208
Upgrade of implanted pacemaker system, conversion of single chamber system to dual chamber system (includes removal of previously placed pulse generator, testing of existing lead, insertion of new lead, insertion of new pulse generator)	33214

Indications for Permanent Pacemaker (CRID-7.1)

Sinus node dysfunction

Permanent pacemaker implantation is medically necessary for any of the following:

- Symptomatic non-reversible sinus node dysfunction as evidenced by **both** of the following:
 - Documented sinus node dysfunction including one of the below:
 - Sinus bradycardia at rate less than 50 beats per minute
 - Sinus pauses greater than 3 seconds
 - Symptoms attributable to non-reversible sinus node dysfunction including **one** of the below:
 - Syncope or pre-syncope
 - Heart failure symptoms
 - Exertional fatigue and impaired exercise tolerance

- Sinus bradycardia at rate less than 40 beats per minute and symptoms possibly related to bradycardia
- Symptomatic sinus bradycardia (as defined above) is a consequence of essential medical management and continued treatment is clinically necessary
- Symptoms attributable to bradycardia as listed above and evidence of tachy-brady syndrome (sinus bradycardia, ectopic atrial bradycardia, or sinus pause alternating with periods of atrial flutter or atrial fibrillation)
- Symptomatic chronotropic incompetence defined as limitations in activity due to the inability of the heart to increase its rate during exercise to achieve 80% of maximum predicted heart rate (220-age).

Atrioventricular block (AVB)

Permanent pacemaker implantation is medically necessary for any of the following:

- AVB including one of the below, with or without symptoms:
 - Second-degree Mobitz type II
 - High-grade (greater than or equal to 2 consecutive P waves at a constant physiologic rate that do not conduct to the ventricles)
 - Third-degree (complete heart block)
- Any degree of AVB with one of the following symptoms that are clearly attributable to the AVB:
 - Syncope or pre-syncope
 - Heart failure symptoms
 - Exertional fatigue and impaired exercise tolerance
- Third-degree and advanced second-degree AV block at any anatomic level associated with sustained or non-sustained ventricular tachycardia (ventricular rhythm at rate greater than 100 bpm lasting greater than or equal to 3 consecutive beats) presumed due to AV block
- Marked first-degree AVB (PR interval greater than or equal to 0.3 seconds) or second-degree AVB with symptoms similar to those of pacemaker syndrome
- Symptomatic AVB as a consequence of guideline directed management and continued treatment is clinically necessary
- Persistent or permanent atrial fibrillation and symptomatic bradycardia including one of the following:
 - Rate less than 50 beats per minute
 - Regular QRS intervals indicating complete atrioventricular block (AVB)
- Second degree AV block with a documented pause of greater than or equal to 5 seconds during waking in the presence of atrial fibrillation, with or without symptoms
- Second degree AV block with documented periods of asystole greater than or equal to 3.0 seconds in the presence of sinus rhythm, with or without symptoms

- Second-degree AVB noted to be located at intra-His or infra-His levels at electrophysiology study (EPS), with or without symptoms
- Any AVB indication listed above occurring after acute myocardial infarction that does not resolve within 5 days
- Congenital complete or high-degree AVB in the presence of any of the following:
 - Symptoms related to bradycardia such as syncope, pre-syncope, heart failure symptoms, exertional fatigue, or impaired exercise tolerance
 - Wide QRS escape rhythm
 - Mean daytime heart rate below 50 bpm
 - Pauses greater than 3 times the cycle length of the ventricular escape rhythm
 - Complex ventricular ectopy
 - Prolonged QT interval
 - Ventricular dysfunction, ventricular dilatation or significant mitral regurgitation

Conduction Disorders with 1:1 Atrioventricular Conduction

Permanent pacemaker implantation is medically necessary for any of the following:

- Individuals with syncope and bundle branch block and one of the following at electrophysiology study (EPS):
 - Baseline HV interval greater than or equal to 70 ms
 - Second- or third-degree intra- or infra-Hisian block during incremental atrial pacing
- Alternating bundle branch block, with or without symptoms
- HV interval greater than or equal to 100 milliseconds noted at EPS, with or without symptoms
- Intra-Hisian- or infra-Hisian block noted at EPS, with or without symptoms

Recurrent syncope

Permanent pacemaker implantation is medically necessary for individuals with recurrent syncope and any of the following:

- Spontaneous documented symptomatic asystolic pause greater than 3 seconds due to sinus arrest or atrioventricular block (AVB)
- Spontaneous documented asymptomatic asystolic pause greater than 6 seconds due to sinus arrest or AVB
- Cardioinhibitory carotid sinus syndrome as documented by one of the below:
 - Syncope caused by spontaneously occurring carotid sinus stimulation
 - Carotid sinus pressure that induces syncope and/or ventricular asystole of greater than or equal to 3 seconds
- Syncope associated with asystole of greater than or equal to 3 seconds during tilt testing

- Bundle branch block and one of the following at electrophysiology study (EPS):
 - Baseline HV interval greater than or equal to 70 ms
 - Second- or third-degree intra- or infra-Hisian block during incremental atrial pacing
- Syncope after cardiac transplantation with or without documentation of bradyarrhythmia
- Recurrent Adam-Stokes syndrome

Peri-procedural and post-operative indications

Permanent pacemaker implantation is medically necessary for any of the following:

- Prior to a planned catheter ablation of the atrioventricular (AV) junction for one of the following:
 - Rate control strategy for management of atrial fibrillation
 - Supraventricular tachycardia resulting in tachycardia induced cardiomyopathy that is not controlled with ablation or medical therapy
- Post Transcatheter Aortic Valve Implantation (TAVI) for any of the following:
 - Complete or high-degree atrioventricular block (AVB) that persists for 24 to 48 hours after TAVI
 - New-onset alternating bundle branch block after TAVI
 - Pre-existing right bundle branch block (RBBB) and new conduction abnormality onset during or after (TAVI) such as:
 - Transient high-degree AVB
 - PR prolongation
 - QRS axis change
- Sinus node dysfunction or AVB associated with symptoms or hemodynamic instability occurring after cardiac surgery that does not resolve within 5 days
- Post cardiac transplant for any of the following:
 - Relative bradycardia that is prolonged or recurrent, which limits rehabilitation or discharge after postoperative recovery
 - Syncope with or without documentation of bradyarrhythmia

Neuromuscular diseases known to involve the heart

Permanent pacemaker implantation is considered medically necessary for progressive neuromuscular diseases known to involve the heart with any degree of atrioventricular (AV) block including first degree AV block or any fascicular block, with or without symptoms, because there may be unpredictable progression of AV conduction disease. Progressive neuromuscular diseases known to involve the heart include:

- Myotonic muscular dystrophy
- Kearns-Sayre syndrome
- Erb dystrophy (limb-girdle muscular dystrophy)
- Peroneal muscular atrophy

Single Chamber Pacemaker Upgrade to Dual Chamber Pacemaker

Upgrade of a single-chamber ventricular pacemaker (VVI) to dual-chamber pacemaker (DDD) is medically necessary when **any** of the following conditions are present:

- Sinus node dysfunction, where atrial pacing is required to maintain chronotropic competence
- Atrioventricular (AV) conduction abnormalities, including first-degree, second-degree (Mobitz I or II), high-grade AV block, or complete heart block, where synchronized atrioventricular pacing is anticipated to improve hemodynamic performance
- Symptoms consistent with pacemaker syndrome (fatigue, hypotension, or syncope resulting from the loss of AV synchrony)

Permanent Pacemaker Implantation - Non-indications (CRID-7.2)

- Permanent pacemaker implantation is **not** medically necessary in any of the following settings:
 - Sinus node dysfunction when there is documentation of any of the following
 - Individual is asymptomatic
 - The symptoms suggestive of bradycardia have been clearly documented to occur in the absence of bradycardia
 - Sinus node dysfunction is due to nonessential drug therapy
 - Fascicular block without AV block or without symptoms concerning for AV block
 - Incidentally noted hypersensitive cardioinhibitory response to carotid sinus stimulation when the individual remains asymptomatic or has vague symptoms
 - Asymptomatic first-degree AV block
 - Asymptomatic type-1 second-degree AV block at the supra-His (AV node) level or that which is not known to be intra- or infra-Hisian
 - Asymptomatic transient AV block in the absence of intraventricular conduction defects or in isolated single fascicular block
 - Situational vasovagal syncope when avoidance behavior is effectively preventing syncopal episodes
 - Prior to Transcatheter Aortic Valve Replacement (TAVR) as a prophylactic measure in individuals with right bundle branch block (RBBB) when there is no indication for permanent pacing
 - For the purpose of cardiac contractility modulation (CCM)

- Upgrade of a single chamber pacemaker (VVI) to a dual chamber pacemaker (DDD) is **not** medically necessary for the indication of persistent atrial fibrillation when it is **not** part of a planned rhythm control strategy.

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Leadless Pacemaker (CRID-11.1)

CID.PM.111.A

v2.0.2026

Codes included

Description	CPT®
Transcatheter insertion of permanent dual-chamber leadless pacemaker, including imaging guidance (e.g., fluoroscopy, venous ultrasound, right atrial angiography, right ventriculography, femoral venography) and device evaluation (e.g., interrogation or programming), when performed; complete system (i.e., right atrial and right ventricular pacemaker components)	0795T
Transcatheter insertion of right atrial pacemaker component (when an existing right ventricular single leadless pacemaker exists to create a dual-chamber leadless pacemaker system)	0796T
Transcatheter insertion of right ventricular pacemaker component (when part of a dual-chamber leadless pacemaker system)	0797T
Transcatheter insertion of permanent single-chamber leadless pacemaker, right atrial, including imaging guidance (e.g., fluoroscopy, venous ultrasound, right atrial angiography and/or right ventriculography, femoral venography, cavography) and device evaluation (e.g., interrogation or programming), when performed	0823T
Transcatheter insertion or replacement of permanent leadless pacemaker, right ventricular, including imaging guidance (e.g., fluoroscopy, venous ultrasound, ventriculography, femoral venography) and device evaluation (e.g., interrogation or programming), when performed	33274

Indications for Leadless Pacemaker

Leadless right ventricular pacemaker (CRID-11.1.1)

CPT® 33274

Permanent right ventricular leadless pacemaker implant is medically necessary when **both** of the following are met:

- The individual meets **any** of the following indications for leadless right ventricular pacemaker:

- Symptomatic paroxysmal or permanent high-grade AV block in the presence of Atrial Fibrillation (AF)
- Symptomatic paroxysmal or permanent high-grade AV block in the absence of AF, as an alternative to dual chamber pacing, when atrial lead placement is considered difficult, high risk, or not deemed necessary for effective therapy
- Symptomatic bradycardia-tachycardia syndrome or sinus node dysfunction (sinus bradycardia or sinus pauses), as an alternative to atrial or dual chamber pacing, when atrial lead placement is considered difficult, high risk, or not deemed necessary for effective therapy
- The following contraindications for leadless pacemaker are **not** present:
 - An implanted inferior vena cava filter
 - A mechanical tricuspid valve

Leadless dual chamber pacemaker system (CRID-11.1.2)

CPT® 0795T

A leadless dual chamber pacemaker is considered not medically necessary when either of the following **contraindications** is present:

- An implanted inferior vena cava filter
- A mechanical tricuspid valve

Permanent dual chamber leadless pacemaker implant is medically necessary in an individual with no contraindications to a leadless pacemaker, when one of the following indications for a permanent dual chamber pacemaker is documented:

Sinus node dysfunction

Permanent pacemaker implantation is medically necessary for any of the following:

- Symptomatic non-reversible sinus node dysfunction as evidenced by **both** of the following:
 - Documented sinus node dysfunction including one of the below:
 - Sinus bradycardia at rate less than 50 beats per minute
 - Sinus pauses greater than 3 seconds
 - Symptoms attributable to non-reversible sinus node dysfunction including **one** of the below:
 - Syncope or pre-syncope
 - Heart failure symptoms
 - Exertional fatigue and impaired exercise tolerance
- Sinus bradycardia at rate less than 40 beats per minute and symptoms possibly related to bradycardia
- Symptomatic sinus bradycardia (as defined above) is a consequence of essential medical management and continued treatment is clinically necessary

- Symptoms attributable to bradycardia as listed above and evidence of tachy-brady syndrome (sinus bradycardia, ectopic atrial bradycardia, or sinus pause alternating with periods of atrial flutter or atrial fibrillation)
- Symptomatic chronotropic incompetence defined as limitations in activity due to the inability of the heart to increase its rate during exercise to achieve 80% of maximum predicted heart rate (220-age).

Atrioventricular block (AVB)

Permanent pacemaker implantation is medically necessary for any of the following:

- AVB including one of the below, with or without symptoms:
 - Second-degree Mobitz type II
 - High-grade (greater than or equal to 2 consecutive P waves at a constant physiologic rate that do not conduct to the ventricles)
 - Third-degree (complete heart block)
- Any degree of AVB with one of the following symptoms that are clearly attributable to the AVB:
 - Syncope or pre-syncope
 - Heart failure symptoms
 - Exertional fatigue and impaired exercise tolerance
- Third-degree and advanced second-degree AV block at any anatomic level associated with sustained or non-sustained ventricular tachycardia (ventricular rhythm at rate greater than 100 bpm lasting greater than or equal to 3 consecutive beats) presumed due to AV block
- Marked first-degree AVB (PR interval greater than or equal to 0.3 seconds) or second-degree AVB with symptoms similar to those of pacemaker syndrome
- Symptomatic AVB as a consequence of guideline directed management and continued treatment is clinically necessary
- When part of a planned rhythm control strategy, persistent atrial fibrillation with symptomatic bradycardia including **either** of the following:
 - Rate less than 50 beats per minute
 - Regular QRS intervals indicating complete atrioventricular block (AVB)
- Second degree AV block with a documented pause of greater than or equal to 5 seconds during waking in the presence of atrial fibrillation, with or without symptoms
- Second degree AV block with documented periods of asystole greater than or equal to 3.0 seconds in the presence of sinus rhythm, with or without symptoms
- Second-degree AVB noted to be located at intra- or infra-His levels at electrophysiology study (EPS), with or without symptoms
- Any AVB indication listed above occurring after acute myocardial infarction that does not resolve within 5 days

- Congenital complete or high-degree AVB in the presence of any of the following:
 - Symptoms related to bradycardia such as syncope, pre-syncope, heart failure symptoms, exertional fatigue, or impaired exercise tolerance
 - Wide QRS escape rhythm
 - Mean daytime heart rate below 50 bpm
 - Pauses greater than 3 times the cycle length of the ventricular escape rhythm
 - Complex ventricular ectopy
 - Prolonged QT interval
 - Ventricular dysfunction, ventricular dilatation or significant mitral regurgitation

Conduction Disorders with 1:1 Atrioventricular Conduction

Permanent pacemaker implantation is medically necessary for any of the following:

- Individuals with syncope and bundle branch block and one of the following at electrophysiology study (EPS):
 - Baseline HV interval greater than or equal to 70 ms
 - Second- or third-degree intra- or infra-Hisian block during incremental atrial pacing
- Alternating bundle branch block, with or without symptoms
- HV interval greater than or equal to 100 milliseconds noted at EPS, with or without symptoms
- Intra-Hisian- or infra-Hisian block noted at EPS, with or without symptoms

Recurrent syncope

Permanent pacemaker implantation is medically necessary for individuals with recurrent syncope and any of the following:

- Spontaneous documented symptomatic asystolic pause greater than 3 seconds due to sinus arrest or atrioventricular block (AVB)
- Spontaneous documented asymptomatic asystolic pause greater than 6 seconds due to sinus arrest or AVB
- Cardioinhibitory carotid sinus syndrome as documented by one of the below:
 - Syncope caused by spontaneously occurring carotid sinus stimulation
 - Carotid sinus pressure that induces syncope and/or ventricular asystole of greater than or equal to 3 seconds
- Syncope associated with asystole of greater than or equal to 3 seconds during tilt testing
- Bundle branch block and one of the following at electrophysiology study (EPS):
 - Baseline HV interval greater than or equal to 70 ms

- Second- or third-degree intra- or infra-Hisian block during incremental atrial pacing
- Syncope after cardiac transplantation with or without documentation of bradyarrhythmia
- Recurrent Adam-Stokes syndrome

Peri-procedural and post-operative indications

Permanent pacemaker implantation is medically necessary for any of the following:

- Prior to a planned catheter ablation of the atrioventricular (AV) junction for supraventricular tachycardia resulting in tachycardia induced cardiomyopathy that is not controlled with ablation or medical therapy
- Post Transcatheter Aortic Valve Implantation (TAVI) for any of the following:
 - Complete or high-degree atrioventricular block (AVB) that persists for 24 to 48 hours after TAVI
 - New-onset alternating bundle branch block after TAVI
 - Pre-existing right bundle branch block (RBBB) and new conduction abnormality onset during or after (TAVI) such as:
 - Transient high-degree AVB
 - PR prolongation
 - QRS axis change
- Sinus node dysfunction or AVB associated with symptoms or hemodynamic instability occurring after cardiac surgery that does not resolve within 5 days
- Post cardiac transplant for any of the following:
 - Relative bradycardia that is prolonged or recurrent, which limits rehabilitation or discharge after postoperative recovery
 - Syncope with or without documentation of bradyarrhythmia

Neuromuscular diseases known to involve the heart

Permanent pacemaker implantation is considered medically necessary for progressive neuromuscular diseases known to involve the heart with any degree of atrioventricular (AV) block including first degree AV block or any fascicular block, with or without symptoms, because there may be unpredictable progression of AV conduction disease. Progressive neuromuscular diseases known to involve the heart include:

- Myotonic muscular dystrophy
- Kearns-Sayre syndrome
- Erb dystrophy (limb-girdle muscular dystrophy)
- Peroneal muscular atrophy

Leadless right atrial pacemaker (CRID-11.1.3)**CPT® 0823T**

Permanent leadless right atrial pacemaker implant is medically necessary when **both** of the following are met:

- Symptomatic sinus node dysfunction (dizziness, syncope, shortness of breath) with normal AV and intraventricular conduction systems
- The following contraindications for leadless pacemaker are not present:
 - An implanted inferior vena cava filter
 - A mechanical tricuspid valve

General information**Right ventricular leadless pacemaker**

The permanent right ventricular leadless pacemakers (CPT® 33274) consist of a single leadless device implanted directly into the right ventricle. The Medtronic Micra™ VR and Abbott Aveir™ VR right ventricular leadless pacemakers are capable only of VVI and VVIR pacing. The Medtronic Micra™ AV right ventricular leadless pacemaker is also capable of VDD pacing. The right ventricular leadless pacemakers do not have capability for atrial pacing. The estimated battery life is about 10 years

Dual chamber leadless pacemaker

In contrast to the right ventricular leadless pacemakers referred to above, the dual chamber leadless pacemaker (i.e., Abbott Aveir™ DR leadless pacemaker system) has dual-chamber sensing and pacing functionality. The Abbott Aveir™ DR leadless pacemaker system consists of two separate components: one implanted in the right atrium and the other in the right ventricle.

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CID.PM.111.A

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Implantable Cardioverter-Defibrillator (ICD) Devices

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Indications for ICD implantation (CRID-2)

CID.ICD.002.A

v2.0.2026

Codes included

Description	CPT®
Insertion or replacement of permanent pacing cardioverter-defibrillator system with transvenous lead(s), single or dual chamber	33249
Insertion or replacement of permanent subcutaneous implantable defibrillator system, with subcutaneous electrode, including defibrillation threshold evaluation, induction of arrhythmia, evaluation of sensing for arrhythmia termination, and programming or reprogramming of sensing or therapeutic parameters when performed	33270

Secondary Prevention ICD indications (CRID-2.1)

Cardiac Arrest Survivors (CRID-2.1.1)

ICD implantation is medically necessary in a survivor of cardiac arrest in the setting of any of the following conditions:

- Cardiac arrest from hemodynamically unstable or sustained VT, polymorphic VT, or VF associated with an acute (less than 48 Hours) MI with **both** of the following conditions:
 - Obstructive CAD with coronary anatomy not amenable to revascularization
 - Ejection fraction less than or equal to 35%
- Cardiac arrest from hemodynamically unstable or sustained VT, polymorphic VT, or VF associated with acute (<48 hours) post-coronary revascularization when **both** of the following conditions exist:
 - No evidence for acute coronary occlusion, restenosis, acute infarct, or other clearly reversible cause
 - Ejection fraction is less than or equal to 35%
- Cardiac arrest from hemodynamically unstable or sustained VT, polymorphic VT, or VF associated with coronary artery disease with **both** of the following conditions:
 - No recent MI (less than or equal to 40 days) prior to arrest
 - No recent coronary revascularization (less than or equal to 3 months) prior to arrest

- Cardiac arrest from hemodynamically unstable or sustained VT, polymorphic VT, or VF during exercise testing when cardiac catheterization performed after the arrest results in **any** of the following:
 - Significant CAD not amenable to revascularization
 - Significant CAD identified and complete revascularization performed
 - Significant CAD identified and incomplete revascularization performed
- Cardiac arrest from hemodynamically unstable or sustained VT, polymorphic VT, or VF not associated with coronary artery disease in the setting of **any** of the following conditions:
 - Non-ischemic dilated cardiomyopathy
 - Myocardial sarcoidosis
 - Giant-cell myocarditis
- Cardiac arrest with idiopathic VF and a normal Ejection Fraction (greater than or equal to 50%) when no reversible causes have been identified including **all** of the following:
 - Pharmacologically induced sustained VT/VF
 - Sustained VT/VF with hypokalemia
 - Wolff-Parkinson-White (WPW) syndrome with VT/VF and successfully ablated pathway

Sustained VT/VF (CRID-2.1.2)

ICD implantation is medically necessary to treat an individual with sustained VT or VF in the setting of any of the following conditions:

- Sustained VT/VF with any of the following genetic diseases:
 - Congenital long QT syndrome
 - Short QT syndrome
 - Catecholaminergic polymorphic VT
 - Brugada syndrome
 - Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC)
 - Hypertrophic cardiomyopathy
- Sustained hemodynamically stable monomorphic VT associated with **non-ischemic** dilated cardiomyopathy when **any** of the following conditions apply:
 - No ablation was performed
 - Ablation did not result in successful termination of all inducible VTs
 - All inducible VTs were successfully ablated and LVEF is less than or equal to 50%
 - Identified bundle branch re-entry was successfully ablated and LVEF is less than or equal to 35%

- Sustained hemodynamically stable monomorphic VT associated with **ischemic** structural heart disease (coronary artery disease with prior MI) when **any** of the following apply:
 - No ablation was performed
 - Ablation did not result in successful termination of all inducible VTs
 - All inducible VTs are successfully ablated and LVEF is less than or equal to 35%
 - Ejection fraction is less than or equal to 35%

Syncope (CRID-2.1.3)

ICD implantation is medically necessary to treat unexplained syncope in an individual with any of the following conditions:

- Long QT syndrome in an individual on beta blocker therapy
- Brugada pattern on ECG
- Catecholaminergic polymorphic VT in an individual on a beta blocker
- Coronary artery disease with a prior MI in the setting of **either** of the following:
 - LVEF 36%-49% and both of the following:
 - No Acute MI (less than or equal to 40 days)
 - Inducible sustained VT/VF on EP study
 - Ejection fraction less than or equal to 35%
- Non-ischemic structural heart disease and any of the following:
 - Left ventricular hypertrophy (LVH) with EF less than or equal to 35%
 - Non-ischemic dilated cardiomyopathy with ejection fraction less than or equal to 35%
 - Left ventricular non-compaction with ejection fraction less than 50%
 - Tetralogy of Fallot with prior corrective surgery
 - Hypertrophic cardiomyopathy
 - Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC)

Evidence Discussion

Secondary prevention refers to an indication for an ICD exclusively for patients who have survived >1 cardiac arrest(s) or episode(s) of sustained VT or VF. A ventricular arrhythmia is considered sustained if it lasts >30 seconds or result in hemodynamically significant symptoms prior to that time (i.e., requiring cardioversion or defibrillation). Patients with cardiac conditions associated with a high risk of sudden cardiac death (SCD) who have unexplained syncope presumed to be the result of a self-terminating ventricular arrhythmia are also considered to have a secondary prevention indication.

Primary Prevention ICD Indications (CRID-2.2)

Ischemic Cardiomyopathy (CRID-2.2.1)

Primary prevention is an indication for an ICD to prevent SCD. It refers to use of ICDs in individuals who are at risk for, but have not yet had, an episode of sustained VT, VF, or cardiac arrest.

ICD implantation is medically necessary for primary prevention of sudden cardiac death (SCD) associated with ischemic cardiomyopathy in the setting of **any** of the following:

- Post-acute MI (less than or equal to 40 Days) with LVEF less than or equal to 30% in the setting of either of the following:
 - Complete revascularization after recent MI with PCI or CABG and **all** of the following:
 - Asymptomatic NSVT (greater than or equal to 4 days post-MI)
 - EPS with inducible VT
 - EPS performed after revascularization and less than 40 day post MI
 - Obstructive CAD not amenable to revascularization with **both** of the following:
 - Asymptomatic NSVT (greater than or equal to 4 days post-MI)
 - EPS with inducible sustained VT (EPS performed within 40 days of MI)
- Post-acute MI (less than or equal to 40 Days) LVEF 31% to 40% when all of the following apply:
 - Asymptomatic NSVT (greater than or equal to 4 days post-MI)
 - EPS with inducible sustained VT (if revascularized, EPS performed after revascularization, within 40 days of MI)
- Post-acute MI (less than or equal to 40 Days) and Pre-Existing Chronic Cardiomyopathy (greater than or equal to 3 Months) with any of the following:
 - LVEF less than or equal to 30% due to old infarction with functional class I-III
 - LVEF less than or equal to 35% with NYHA functional class II-III
- Post MI (greater than 40 Days) with any of the following conditions:
 - LVEF less than or equal to 35% and both:
 - NYHA functional class I, II, or III
 - No PCI/CABG within 3 months
 - LVEF 36%-40% with all of the following:
 - No PCI/CABG within 3 months
 - Asymptomatic NSVT
 - EPS with inducible sustained VT
 - PCI or CABG (less than or equal to 3 Months) with LVEF less than or equal to 35% on OMT for greater than or equal to 3 months prior to PCI/CABG

- Ischemic cardiomyopathy with LVEF less than or equal to 35% and either of the following:
 - Individual has completed greater than or equal to 3 months of **OMT**
 - Individual has completed less than 3 months of **OMT** with either of the following findings:
 - NSVT
 - EPS with inducible sustained VT

Post Myocardial Infarction (MI) Need for Pacemaker Therapy (CRID-2.2.2)

ICD implantation is considered medically necessary in individuals with ischemic cardiomyopathy and a need for post-MI pacemaker therapy when **both** of the following clinical conditions exist:

- LVEF less than or equal to 35% in the setting of **either** of the following:
 - Individual is post-acute MI (less than or equal to 40 Days)
 - Individual is post MI (greater than 40 Days) with PCI or CABG (greater than or equal to 3 Months)
- **Any** of the following indications for pacemaker exist:

Sinus node dysfunction

Permanent pacemaker implantation is medically necessary for any of the following:

- Symptomatic non-reversible sinus node dysfunction as evidenced by **both** of the following:
 - Documented sinus node dysfunction including one of the below:
 - Sinus bradycardia at rate less than 50 beats per minute
 - Sinus pauses greater than 3 seconds
 - Symptoms attributable to non-reversible sinus node dysfunction including **one** of the below:
 - Syncope or pre-syncope
 - Heart failure symptoms
 - Exertional fatigue and impaired exercise tolerance
- Sinus bradycardia at rate less than 40 beats per minute and symptoms possibly related to bradycardia
- Symptomatic sinus bradycardia (as defined above) is a consequence of essential medical management and continued treatment is clinically necessary
- Symptoms attributable to bradycardia as listed above and evidence of tachy-brady syndrome (sinus bradycardia, ectopic atrial bradycardia, or sinus pause alternating with periods of atrial flutter or atrial fibrillation)

- Symptomatic chronotropic incompetence defined as limitations in activity due to the inability of the heart to increase its rate during exercise to achieve 80% of maximum predicted heart rate (220-age).

Atrioventricular block (AVB)

Permanent pacemaker implantation is medically necessary for any of the following:

- AVB including one of the below, with or without symptoms:
 - Second-degree Mobitz type II
 - High-grade (greater than or equal to 2 consecutive P waves at a constant physiologic rate that do not conduct to the ventricles)
 - Third-degree (complete heart block)
- Any degree of AVB with one of the following symptoms that are clearly attributable to the AVB:
 - Syncope or pre-syncope
 - Heart failure symptoms
 - Exertional fatigue and impaired exercise tolerance
- Third-degree and advanced second-degree AV block at any anatomic level associated with sustained or non-sustained ventricular tachycardia (ventricular rhythm at rate greater than 100 bpm lasting greater than or equal to 3 consecutive beats) presumed due to AV block
- Marked first-degree AVB (PR interval greater than or equal to 0.3 seconds) or second-degree AVB with symptoms similar to those of pacemaker syndrome
- Symptomatic AVB as a consequence of guideline directed management and continued treatment is clinically necessary
- Persistent or permanent atrial fibrillation and symptomatic bradycardia including one of the following:
 - Rate less than 50 beats per minute
 - Regular QRS intervals indicating complete atrioventricular block (AVB)
- Second degree AV block with a documented pause of greater than or equal to 5 seconds during waking in the presence of atrial fibrillation, with or without symptoms
- Second degree AV block with documented periods of asystole greater than or equal to 3.0 seconds in the presence of sinus rhythm, with or without symptoms
- Second-degree AVB noted to be located at intra-His or infra-His levels at electrophysiology study (EPS), with or without symptoms
- Any AVB indication listed above occurring after acute myocardial infarction that does not resolve within 5 days
- Congenital complete or high-degree AVB in the presence of any of the following:
 - Symptoms related to bradycardia such as syncope, pre-syncope, heart failure symptoms, exertional fatigue, or impaired exercise tolerance

- Wide QRS escape rhythm
- Mean daytime heart rate below 50 bpm
- Pauses greater than 3 times the cycle length of the ventricular escape rhythm
- Complex ventricular ectopy
- Prolonged QT interval
- Ventricular dysfunction, ventricular dilatation or significant mitral regurgitation

Conduction Disorders with 1:1 Atrioventricular Conduction

Permanent pacemaker implantation is medically necessary for any of the following:

- Individuals with syncope and bundle branch block and one of the following at electrophysiology study (EPS):
 - Baseline HV interval greater than or equal to 70 ms
 - Second- or third-degree intra- or infra-Hisian block during incremental atrial pacing
- Alternating bundle branch block, with or without symptoms
- HV interval greater than or equal to 100 milliseconds noted at EPS, with or without symptoms
- Intra-Hisian- or infra-Hisian block noted at EPS, with or without symptoms

Recurrent syncope

Permanent pacemaker implantation is medically necessary for individuals with recurrent syncope and any of the following:

- Spontaneous documented symptomatic asystolic pause greater than 3 seconds due to sinus arrest or atrioventricular block (AVB)
- Spontaneous documented asymptomatic asystolic pause greater than 6 seconds due to sinus arrest or AVB
- Cardioinhibitory carotid sinus syndrome as documented by one of the below:
 - Syncope caused by spontaneously occurring carotid sinus stimulation
 - Carotid sinus pressure that induces syncope and/or ventricular asystole of greater than or equal to 3 seconds
- Syncope associated with asystole of greater than or equal to 3 seconds during tilt testing
- Bundle branch block and one of the following at electrophysiology study (EPS):
 - Baseline HV interval greater than or equal to 70 ms
 - Second- or third-degree intra- or infra-Hisian block during incremental atrial pacing
- Syncope after cardiac transplantation with or without documentation of bradyarrhythmia

- Recurrent Adam-Stokes syndrome

Peri-procedural and post-operative indications

Permanent pacemaker implantation is medically necessary for any of the following:

- Prior to a planned catheter ablation of the atrioventricular (AV) junction for one of the following:
 - Rate control strategy for management of atrial fibrillation
 - Supraventricular tachycardia resulting in tachycardia induced cardiomyopathy that is not controlled with ablation or medical therapy
- Post Transcatheter Aortic Valve Implantation (TAVI) for any of the following:
 - Complete or high-degree atrioventricular block (AVB) that persists for 24 to 48 hours after TAVI
 - New-onset alternating bundle branch block after TAVI
 - Pre-existing right bundle branch block (RBBB) and new conduction abnormality onset during or after (TAVI) such as:
 - Transient high-degree AVB
 - PR prolongation
 - QRS axis change
- Sinus node dysfunction or AVB associated with symptoms or hemodynamic instability occurring after cardiac surgery that does not resolve within 5 days
- Post cardiac transplant for any of the following:
 - Relative bradycardia that is prolonged or recurrent, which limits rehabilitation or discharge after postoperative recovery
 - Syncope with or without documentation of bradyarrhythmia

Neuromuscular diseases known to involve the heart

Permanent pacemaker implantation is considered medically necessary for progressive neuromuscular diseases known to involve the heart with any degree of atrioventricular (AV) block including first degree AV block or any fascicular block, with or without symptoms, because there may be unpredictable progression of AV conduction disease. Progressive neuromuscular diseases known to involve the heart include:

- Myotonic muscular dystrophy
- Kearns-Sayre syndrome
- Erb dystrophy (limb-girdle muscular dystrophy)
- Peroneal muscular atrophy

Non-ischemic Cardiomyopathy (CRID-2.2.3)

ICD implantation is medically necessary for primary prevention of SCD associated with non-ischemic cardiomyopathy in the setting of **any** of the following conditions:

- Idiopathic non-ischemic cardiomyopathy when **all** of the following apply:
 - LVEF less than or equal to 35% after greater than or equal to 3 months of **OMT**
 - Age less than or equal to 85 years
 - Functional NYHA class I-III
- Non-ischemic cardiomyopathy with recent valve surgery or TAVR with **all** of the following:
 - Recent Valve surgery or TAVR (within 3 months)
 - LVEF less than or equal to 35%
 - Need for pacemaker and LV function felt not likely to improve
- Non-ischemic cardiomyopathy from other specific etiologies in the setting of **any** of the following conditions:
 - Giant-cell myocarditis regardless of the LVEF
 - Sarcoid heart disease when LVEF is less than or equal to 35%
 - Myotonic dystrophy when LVEF is less than or equal to 35%
 - Chagas disease when LVEF is less than or equal to 35%
- Peripartum cardiomyopathy when **both** of the following apply:
 - Individual has completed 3 or more months of OMT
 - LVEF of 35% or less is persistent for 3 or more months post-partum
- **Any** of the following genetic conditions with structural heart disease:
 - Hypertrophic cardiomyopathy with **1 or more** of the following risk factor(s):
 - LV wall thickness greater than or equal to 30mm
 - SCD in 1 or more first-degree relatives presumably caused by HCM
 - 1 or more episodes of unexplained syncope within the preceding 6 months
 - Spontaneous NSVT
 - Abnormal blood pressure response with exercise
 - Arrhythmogenic right ventricular dysplasia/CM
 - Evidence of structural cardiac disease with Lamin A/C mutation or other genetic ACM with LVEF less than or equal to 45%
- **Either** of the following genetic conditions without structural heart disease:
 - Catecholaminergic Polymorphic VT with **both** of the following:
 - Non-sustained VT
 - one of the following:
 - Not tolerating medical therapy (beta-blockers, flecainide, or propafenone)
 - Breakthrough non-sustained ventricular arrhythmia on medical therapy (beta-blockers, flecainide, or propafenone)
 - Brugada by ECG (Type I ECG Pattern) with inducible VT or VF at EPS

Pre or Post Heart Transplant (CRID-2.2.4)

ICD implantation is medically necessary for primary prevention of SCD for **either** of the following indications:

- Individual is on waiting list for heart transplant (outpatient status)
- Individual is post heart transplant with multiple episodes of cellular or antibody-mediated rejection

ICD Non-indications (CRID-2.7)**Non-indications**

ICD implantation is considered **not medically necessary** in any of the following settings:

- Incessant VT or VF (hemodynamically stable VT or VF continuing for hours)
- VF or VT is due to a reversible cause such as:
 - Severe electrolyte disturbance
 - Drug-induced Torsades de Pointes (TdP)
 - Acute, reperfused myocardial infarction with preserved ejection fraction
- In an ablation candidate without structural heart disease

Substernal implantable cardioverter-defibrillator (CRID-2.8)**CPT® 0571T**

- Substernal implantable cardioverter-defibrillator systems involve inserting a defibrillator lead directly beneath the sternum anterior to the heart and is intended to provide anti-tachycardia pacing as well as post-shock pacing without intravenous leads.
- At this time, substernal implantable cardioverter-defibrillator systems are considered experimental, investigational, and unproven.

Evidence Discussion

ICD implantation is **not** medically necessary for individuals who do not have a reasonable expectation of survival with an acceptable functional status for at least one year, even if they meet ICD implantation criteria listed in this guideline.

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CID.ICD.002.A

v2.0.2026

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Pediatric Implantable Cardioverter Defibrillator

CID.ICD.12.A
v2.0.2026

Pediatric ICD Indications (CRID-12)

General Information

The decision to manage a pediatric condition with an implantable cardioverter defibrillator should be shared between a pediatric electrophysiologist and an informed individual/guardian/parent. This includes education of the individual/guardian/parent on all available options/potential side-effects, including inaction. This is of particular importance in individuals with limited health literacy at risk for poor health outcomes. These guidelines have been developed based on the 2021 PACES Expert Consensus Statement on the Indications and Management of Cardiovascular Implantable Electronic Devices in Pediatric individuals and the 2024 AHA/ACC/AMSSM/HRS/PACES/SCMR Guideline for the Management of Hypertrophic Cardiomyopathy.

These guidelines are not considered to be all-inclusive but to provide a path to the current indications supported by the societies and evidence.

Coding

Description	CPT®
Insertion or replacement of permanent pacing cardioverter-defibrillator system with transvenous lead(s), single or dual chamber	33249
Insertion or replacement of permanent subcutaneous implantable defibrillator system, with subcutaneous electrode, including defibrillation threshold evaluation, induction of arrhythmia, evaluation of sensing for arrhythmia termination, and programming or reprogramming of sensing or therapeutic parameters when performed	33270

Implantable Cardioverter-defibrillator General Indications (CRID-12.0)

ICD implantation is considered medically necessary for survivors of pediatric sudden cardiac arrest (SCA) from ventricular tachycardia (VT) or ventricular fibrillation (VF) when both of the following have been addressed:

- completely reversible causes have been excluded

- ICD is decided in consultation with an informed individual/guardian/parent to be more beneficial than alternative treatments that may significantly reduce the risk of SCA

ICD implantation is considered medically necessary for sustained VT that cannot be adequately controlled with medication and/or catheter ablation.

ICD therapy is considered medically necessary for primary prevention of SCA when all of the following conditions exist:

- decision has been made in consultation with an informed individual/guardian/parent
- the individual has a history of either of the following:
 - a genetic cardiovascular disease and risk factors for SCA
 - a pathogenic mutation and a family history of recurrent SCA

ICD replacement is considered medically necessary in a pediatric individual when indications have been reconsidered based on the most recent guidelines to evaluate for discontinuance of therapy.

Long QT Syndrome (LQTS) (CRID-12.1)

ICD implantation is considered medically necessary in individuals with LQTS in any of the following settings:

- survivors of SCA along with the use of beta-blockade
- individuals with symptoms (arrhythmic syncope or VT) when beta-blockade is either ineffective or not tolerated and cardiac sympathetic denervation or other medications are not considered effective alternatives
- primary prevention in individuals with established clinical risk factors and/or pathogenic mutation

Catecholaminergic Polymorphic Ventricular Tachycardia (CRID-12.2)

ICD implantation is considered medically necessary in individuals with a diagnosis of CPVT in any of the following settings:

- persistent cardiac arrest or arrhythmic syncope despite treatment with beta-blocker and flecainide or cardiac sympathetic denervation
- in combination with pharmacologic therapy with or without cardiac sympathetic denervation when aborted SCA is the initial presentation of CPVT
- documented polymorphic or bidirectional VT despite pharmacologic therapy with or without cardiac sympathetic denervation

Brugada Syndrome (BrS) (CRID-12.3)

ICD implantation is considered medically necessary in individuals with a diagnosis of BrS when there is a history of any of the following conditions:

- survivors of SCA

- documented spontaneous sustained VT
- a spontaneous type I Brugada ECG pattern with a history of recent syncope presumed due to a ventricular arrhythmia
- syncope presumed due to a ventricular arrhythmia with a type I Brugada ECG pattern only with provocative medications

Hypertrophic Cardiomyopathy (HCM) (CRID-12.4)

ICD implantation is considered medically necessary in individuals with HCM in the setting of any of the following conditions:

- survivors of SCA
- spontaneous sustained VT
- ICD is decided after considering the potential complications of long-term ICD placement in consultation with an informed individual/guardian/parent to be more beneficial than alternative treatments in an individual with ≥ 1 primary risk factors including any of the following:
 - unexplained syncope
 - massive left ventricular hypertrophy
 - non-sustained VT
 - family history of early HCM-related SCD
- in individuals with HCM without the above risk factors but with secondary risk factors for SCA such as extensive LGE on cardiac MRI or systolic dysfunction

Arrhythmogenic Cardiomyopathies (ACM) (CRID-12.5)

ICD implantation is considered medically necessary in individuals in any of the following settings:

- individual has been resuscitated from SCA or sustained VT that is not hemodynamically tolerated
- in individuals with hemodynamically tolerated sustained VT, syncope presumed due to ventricular arrhythmia, or an LVEF less than or equal to 35%.
- in individuals with inherited ACM associated with increased risk of SCD based on an assessment of additional risk factors

Non-ischemic Dilated Cardiomyopathy (NIDCM) (CRID-12.6)

ICD implantation is considered medically necessary in individuals with NIDCM who either survive SCA or experience sustained VT not due to completely reversible causes.

ICD implantation is considered medically necessary in individuals with NIDCM and syncope or an LVEF $\leq 35\%$ after less than or equal to 3 months of **OMT**.

Congenital Heart Disease (CHD) (CRID-12.7)

ICD implantation is considered medically necessary for individuals with CHD for any of the following reasons:

- survivors of SCA when evaluation to define the cause of the event does not reveal any completely reversible causes
- individuals with hemodynamically unstable sustained VT who have undergone hemodynamic and electrophysiologic evaluation
- individuals with systemic LVEF $\leq 35\%$ and sustained VT or presumed arrhythmogenic syncope
- individuals with spontaneous hemodynamically stable sustained VT who have undergone hemodynamic and electrophysiologic evaluation
- individuals with a single or systemic right ventricular ejection fraction less than or equal to 35%, particularly in the presence of additional risk factors such as VT, arrhythmic syncope, or severe systemic AV valve insufficiency.

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CID.ICD.12.A

v2.0.2026

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Cardiac Resynchronization Therapy (CRT) Devices

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Indications for Cardiac Resynchronization Therapy (CRT-D) Implantation (CRID-5)

CID.CRT.005.A

v2.0.2026

Procedures included

CPT® 33224, 33225, 33208, 33229, 33249, 33264

Ischemic Cardiomyopathy (CRID-5.1)

CRT-D implantation is medically necessary for the treatment of ischemic cardiomyopathy when LVEF is less than or equal to 35% after greater than or equal to 3 month **OMT** with **any** of the following conditions:

- Sinus Rhythm with LBBB and **both** of the following:
 - QRS from 120 msec to 149 msec
 - NYHA Functional Class II, III, or ambulatory IV
- Sinus Rhythm with LBBB and **both** of the following:
 - QRS greater than or equal to 150 msec
 - NYHA functional class I, II, III, or ambulatory IV
- Sinus rhythm with non-LBBB and **both** of the following:
 - QRS greater than or equal to 150 msec
 - NYHA functional class III, or ambulatory IV
- Persistent or permanent atrial fibrillation and LBBB with QRS greater than or equal to 150 msec

CRT-P is considered medically necessary when all of the requirements of CRT-D have been met and the individual in consultation with the providing physician declines the ICD function.

Non-ischemic Cardiomyopathy (CRID-5.3)

CRT-D is medically necessary for the treatment of non-ischemic cardiomyopathy when LVEF is less than or equal to 35% after greater than or equal to 3 months of **OMT** with **any** of the following conditions:

- Sinus rhythm with LBBB and **both** of the following:

- QRS 120 msec to 149 msec
- NYHA Functional Class II, III, or ambulatory IV
- Sinus rhythm with LBBB and **both** of the following:
 - QRS greater than or equal to 150 msec
 - NYHA Functional Class I, II, III, or ambulatory IV
- Sinus rhythm with Non-LBBB and **both** of the following:
 - QRS greater than or equal to 150 msec
 - NYHA Functional class III, or ambulatory class IV
- Persistent or Permanent atrial fibrillation and **both** of the following:
 - QRS greater than or equal to 150 msec
 - LBBB

CRT-P is considered medically necessary when all of the requirements of CRT-D have been met and the individual in consultation with the providing physician declines the ICD function.

Current or Anticipated RV Pacing with an Indication for an ICD (CRID-5.6)

CRT-D implantation is considered medically necessary for treatment of individuals who meet **all** of the following conditions:

- Current or anticipated RV pacing over 40%
- LVEF less than or equal to 35% after greater than or equal to 3 months of **OMT**
- NYHA Functional Class I, II, III, or ambulatory IV

CRT-P is considered medically necessary when all of the requirements of CRT-D have been met and the individual in consultation with the providing physician declines the ICD function.

Indications for upgrade to CRT-D (CRID-5.7)

Upgrade to CRT-D is medically necessary in individuals who have an implanted non-CRT-D ICD when **either** of the following conditions are documented:

- LVEF greater than or equal to 50% prior to ICD implant and **both** of the following are documented:
 - RV pacing burden greater than or equal to 40%
 - **One** of the following changes has occurred after implantation of non-CRT ICD:
 - Decline in LVEF greater than or equal to 10%
 - New or worsening heart failure symptoms (NYHA Class II or III)

- LV ejection fraction less than or equal to 35% after greater than or equal to 3 months of **OMT** and **both** of the following are documented:
 - New or worsening symptomatic heart failure (NYHA functional Class II, III, or ambulatory class IV) following implantation of a non-CRT pacemaker or cardioverter-defibrillator (ICD)
 - Ventricular pacing greater than or equal to 40%

CRT-P is considered medically necessary in an individual with a non CRT pacemaker when all of the other requirements of CRT-D have been met and the individual in consultation with the providing physician declines the ICD function.

Indications for CRT-P (CRID-5.8)

Procedures included

CPT® 33224, 33225, 33208, 33229

CRT-P is medically necessary for any of the following:

- High grade AV block and NYHA Class I, II or III Congestive Heart Failure:
 - Initial CRT-P implantation is medically necessary in individuals who have **all** of the following:
 - LV ejection fraction less than 50%
 - NYHA Class I, II, or III heart failure
 - High grade AV block, including AV nodal ablation, requiring more than 40% ventricular pacing CRT-P
- Pacing-induced cardiomyopathy
 - Upgrade from non-CRT pacemaker to CRT-P is medically necessary in individuals who have **all** of the following:
 - LVEF greater than or equal to 50% prior to implantation of non-CRT pacemaker
 - Right ventricular pacing burden greater than or equal to 40%
 - One of the following occurring after implantation of non-CRT pacemaker:
 - Decline in LVEF greater than or equal to 10%
 - New or worsening heart failure symptoms NYHA Class II or III
- See also **Indications for Cardiac Resynchronization Therapy (CRT)-D Implantation** for individuals who have met requirements for CRT-D, but decline the ICD function

Indications for conduction system pacing

His bundle pacing or left bundle branch area pacing (CPT® 33207 or CPT® 33208) is considered medically necessary when **Indications for CRT** are met and one of the following applies:

- LV lead placement was attempted and was unsuccessful or suboptimal
- His bundle pacing or left bundle branch area pacing is planned in place of biventricular pacing

CRT Implantation - Non-indications (CRID-5.9)

Ischemic cardiomyopathy

CRT-D or CRT-P implantation is **not** medically necessary in individuals with ischemic cardiomyopathy who have had a myocardial infarction within the past 40 days or who have had coronary revascularization within the past 90 days **unless** a separate indication for permanent pacemaker or ICD implantation exists (thus preventing a likely repeat procedure for an upgraded device in the near future)

Reversible causes of cardiomyopathy

CRT-D implantation is **not** medically necessary in the setting of a reversible cardiomyopathy such as: toxic, metabolic, or tachycardia induced cardiomyopathy

Note: Once the reversible aberration is corrected, clinical reassessment is indicated

Wireless cardiac resynchronization - Criteria (CRID-5.10)

- Permanent LV leadless pacemakers (CPT® 0515T) are implanted directly in the left ventricle for synchronization with RV leads in the setting of cardiac resynchronization therapy. At this time, they are considered experimental, investigational, or unproven.

Evidence Discussion CRT

Evidence Discussion

Cardiac Resynchronization Pacing Therapy (CRT-P)

Asynchrony of electrical activation of different portions of the ventricles results in dyssynchrony of mechanical contraction leading to decreased efficiency of pump function. The cardiac resynchronization pacing device synchronizes electrical activation through a right ventricular lead and a lead inserted into a branch of the coronary venous system for left ventricular activation. Clinical decision-making for cardiac resynchronization pacing therapy includes consideration of an individual's risk of worsening symptomatic heart failure and the anticipated likelihood of favorable clinical response to cardiac resynchronization therapy balanced against short-term procedural risks (e.g., cardiac tamponade and contrast-mediated acute kidney injury) as well as

long-term device-related risks (e.g., thrombosis and infection). Randomized controlled clinical trials and systematic reviews of these trials provide valuable information to guide optimal selection of candidates for cardiac resynchronization pacing therapy. For instance, the benefit-risk assessment for cardiac resynchronization pacing therapy is favorable for individuals with left ventricular ejection fraction less than 50% who require frequent ventricular pacing greater than 40% of the time. Conversely, the benefit-risk assessment for cardiac resynchronization pacing therapy is NOT favorable for individuals who have better left ventricular ejection fraction or who do not require ventricular pacing or require ventricular pacing only infrequently. Indications for cardiac resynchronization pacing therapy are based on well-established clinical medical specialty organization evidence-based guideline recommendations and Appropriate Use Criteria.

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CID.CRT.005.A

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Cardiac Devices for Other Conditions

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Wireless pulmonary artery pressure sensor - Criteria (CRID-13)

Codes addressed

Description	CPT®
Transcatheter implantation of wireless pulmonary artery pressure sensor for long-term hemodynamic monitoring, including deployment and calibration of the sensor, right heart catheterization, selective pulmonary catheterization, radiological supervision and interpretation, and pulmonary artery angiography, when performed	33289

Indications

Although FDA approved, the wireless pulmonary artery pressure sensor device (e.g., CardioMEMS™ HF System) has yet to be incorporated into the standard of care and is considered experimental, investigational, or unproven at this time.

Evidence Discussion

Wireless Pulmonary Artery Pressure Sensor devices (CPT® 33289) such as CardioMEMS™ HF System, are implanted into a branch of the pulmonary artery during right heart catheterization and require a specialized delivery system. These devices monitor constant pulmonary artery pressures over time, utilizing the concept that as pulmonary artery pressures increase, outpatient medical therapy can be adjusted. This can potentially reduce inpatient admissions and treatment.

- Although FDA approved, these devices have yet to be incorporated into the standard of care and remain investigational and experimental at this time.

Wireless Left Atrial Pressure Sensor (CID-14)

Codes included

Description	CPT®
Transcatheter implantation of wireless left atrial pressure sensor for long-term left atrial pressure monitoring, including sensor calibration and deployment, right heart catheterization, transseptal puncture, imaging guidance, and radiological supervision and interpretation	0933T

Indications

Further studies are needed to evaluate the safety, clinical efficacy, and long-term stability of the wireless left atrial pressure sensor device. Wireless left atrial pressure sensor is considered experimental, investigational, or unproven at this time.

Evidence Discussion

Wireless left atrial pressure sensor (e.g., V-LAP™ system) implantation is performed percutaneously via femoral vein access and trans-atrial septal approach. It is proposed that the availability of hemodynamic parameters might allow clinicians to tailor heart failure treatment.

Cardiac Contractility Modulation (CRID-15)

Codes included

Description	CPT®
Insertion or replacement of permanent cardiac contractility modulation system, including contractility evaluation when performed, and programming of sensing and therapeutic parameters; pulse generator with transvenous electrodes	0408T
Insertion of permanent cardiac contractility modulation-defibrillation system component(s), including fluoroscopic guidance, and evaluation and programming of sensing and therapeutic parameters; pulse generator and dual transvenous electrodes/leads (pacing and defibrillation)	0915T

Cardiac contractility modulation (CCM)**CPT® 0408T**

Currently, there is insufficient evidence of benefit of cardiac contractility modulation (CCM) on clinical outcomes. CCM devices (e.g., Optimizer Smart®) are considered experimental, investigational, or unproven at this time.

Combined Cardiac Contractility Modulation and Implantable Cardioverter-Defibrillator Device (CCM-D)**CPT® 0915T**

Currently there is insufficient evidence of safety, efficacy, and benefit of combined cardiac contractility modulation and implantable cardioverter defibrillator devices (CCM-D) devices on clinical outcomes. CCM-D devices (e.g., Optimizer® Integra™ CCM-D System) are considered experimental, investigational, or unproven at this time.

Evidence Discussion

Cardiac contractility modulation (CCM) delivers electrical signals during the ventricular absolute refractory period. This does not generate an action potential or mechanical contraction but is proposed to enhance ventricular contractile strength. CCM has been proposed as a potential treatment option for individuals with symptomatic heart failure with reduced left ventricular ejection fraction who are not candidates for cardiac resynchronization therapy.

CCM has previously been used along with a separate implantable cardioverter-defibrillator device (ICD). The Combined Cardiac Contractility Modulation and Implantable Cardioverter-Defibrillator Device (CCM-D) combines CCM and ICD functionality in one device.

Baroreflex Activation Therapy (CRID-16)

Description	CPT®
Initial open implantation of baroreflex activation therapy (BAT) modulation system, including lead placement onto the carotid sinus, lead tunneling, connection to a pulse generator placed in a distant subcutaneous pocket (ie, total system), and intraoperative interrogation and programming	64654

Currently there is insufficient evidence of benefit of baroreflex activation therapy on clinical outcomes. Carotid baroreflex activation therapy (e.g., Barostim™ device) is considered experimental, investigational, or unproven at this time.

Evidence Discussion

Carotid baroreflex activation therapy (e.g., Barostim™ device) uses a subcutaneously implanted pulse generator and electrode system to deliver electrical impulses to the carotid artery baroreceptors. Carotid baroreflex activation is aimed at decreasing sympathetic activity and increasing parasympathetic activity and has been proposed as a potential treatment option for individuals with symptomatic heart failure with reduced left ventricular ejection fraction.

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