2025 Coding and Reimbursement for Arrhythmia and Pain Management

AtriCure

Introduction

This information is shared for educational purposes and current as of January 1, 2025. This information is not and should not be construed as reimbursement, coding or legal advice. Healthcare providers (HCPs) are solely responsible for the accuracy of codes selected for the services rendered and reported in the patient's medical records. AtriCure makes no representation, warranty, or guarantee as to the timeliness, accuracy, or completeness of this information. AtriCure does not assume responsibility for coding decisions, nor recommend codes for specific cases. Items and services that are billed to payers must be medically necessary and supported by appropriate documentation. AtriCure does not promote off-label use of its devices. While a code might exist describing certain procedures and or technologies, this does not guarantee payment by payers.

Table of Contents

Devices 1

Arrythmia Management 3

- **Reimbursement Overview** 3
- **Open-Chest Surgical Ablation** 4
  - Physician Coding and Reimbursement 4
  - Inpatient Facility Coding and Reimbursement 4
- **Valve Procedures** 5
  - Physician Coding and Reimbursement 5
  - Inpatient Facility Coding and Reimbursement 5
- **Minimally Invasive Closed-Chest Ablation and Access** 6
  - Physician Coding and Reimbursement 6
  - Inpatient Facility Coding and Reimbursement 6
  - Outpatient Hospital Reimbursement 7
- **Left Atrial Appendage Management** 8
  - Physician Coding and Reimbursement 8
  - Inpatient Facility Coding and Reimbursement 8
- **Arrhythmia Reimbursement Resources** 9
  - Common ICD-10 Codes Used During LAAM, Cardiac Surgery and Electrophysiology Ablation 9
  - Additional Physician Coding and Reimbursement 10
  - Additional Reimbursement Resources 10

Cryoablation 11

- Physician Coding and Reimbursement 11
- Inpatient Facility Coding and Reimbursement 11
- Outpatient Facility Coding and Reimbursement 12
- Procedure Descriptions 12
- **Cryoablation Reimbursement Resources** 12
  - Additional Cryoablation Coding and Reimbursement 12
  - Additional Reimbursement Resources 12

Product Indications 13

Devices

Product Offerings

AtriCure product offerings include, but are not limited to, Bipolar Radiofrequency (RF) and cryoablation surgical ablation devices, the AtriClip® Left Atrial Appendage Exclusion (LAAE) System, the EPi-Sense® Coagulation device and Cryo Nerve Block (cryoNB) probes.

Arrhythmia Management

Bipolar RF Clamps

Isolator® Synergy™ Clamp, Standard and Long Jaw

Isolator® Synergy™ EnCompass® Clamp, Short

Isolator® Synergy Access® Clamp

Isolator® Synergy™ Clamp, Right and Left

Cryoablation Probes

cryoICE® Cryoablation Probes

cryoFORM® Cryoablation Probe

Linear Pens and Probes

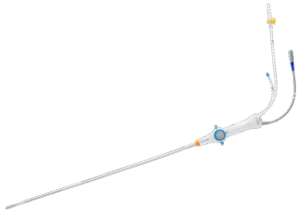
Isolator® Transpolar Pen, Long

Isolator® Linear Pen

Coolrail® Linear Pen

Minimally Invasive Closed-Chest

EPi-Sense® Coagulation Device



EPi-Sense® ST Coagulation Device

Epicardial Access Devices

EPi-Ease™ Device

LAAE

AtriClip LAA Exclusion System

AtriClip FLEX-Mini™ Device

AtriClip FLEX•V® Device

AtriClip PRO•V® Device

AtriClip PRO2® Device

AtriClip FLEX® Device

AtriClip PRO® Device

AtriClip® Long Device

AtriClip® Standard Device

cryoNB

cryoNB Probes

cryoSPHERE® Probe

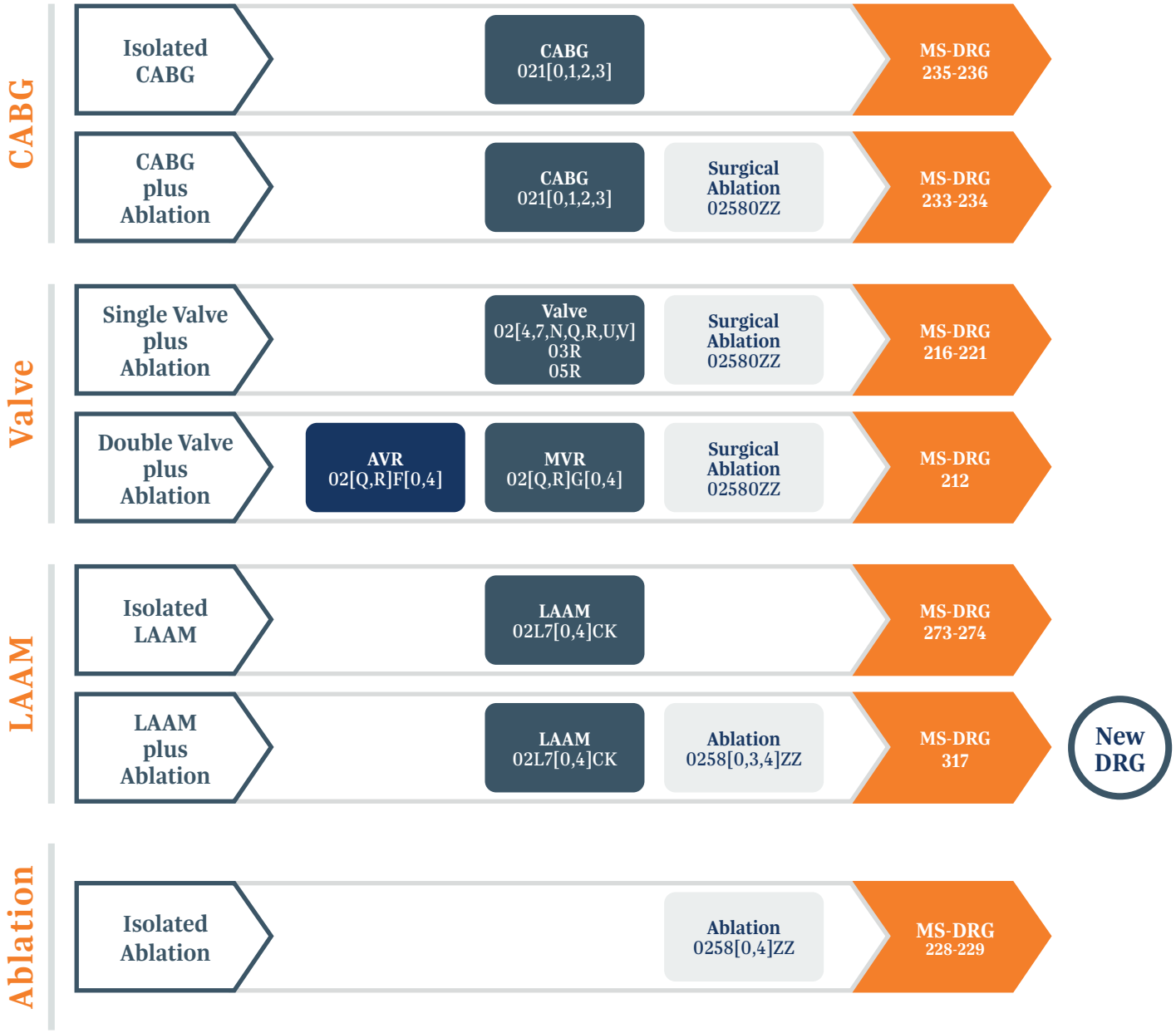
cryoSPHERE®+ Probe

cryoSPHERE® MAX Probe

Arrhythmia Management

Reimbursement Overview

2025 MS-DRG Coding Updates
Discharges October 1, 2024 through September 30, 2025



CABG = coronary artery bypass graft
AVR = aortic valve repair
MVR = mitral valve replacement
MS-DRG = Medicare severity-diagnosis-related group

Please note applicable guidelines and instructions of ICD-10-PCS (Internal Classification of Disease, Tenth Revision, Clinical Modification Procedure Coding Systems) codes are subject to change at any time.

The ICD-10-PCS codes are representative of the codes listed in the 2025 CMS Grouper V42.0 and not meant to be a comprehensive list. When there is more than one code for a procedure, the code listed is specific to the AtriCure device. For a complete list of codes by grouper please use this link: https://www.cms.gov/icd10m/FY2025-NPRM-Version42-fullcode-cms/fullcode_cms/P0120.html

Open-Chest Surgical Ablation

Physician Coding and Reimbursement

Current Procedure Terminology (CPT®) are codes describing the procedure during the patient visit. CPT codes that may be appropriate for procedures used in conjunction with open-chest surgical ablation are included below.

Table 1. Open-Chest Surgical Ablation Physician Coding and Reimbursement

CPT*	Description	CY 2025 Physician Work Relative Value Units (RVUs)	CY 2025 Physician Total RVU	CY 2025 National Payment Rate **
Cardiac Surgical Ablation				
33250	Operative ablation of supraventricular arrhythmogenic focus or pathway without cardiopulmonary bypass	25.90	43.01	$1,391
33251	Operative ablation of supraventricular arrhythmogenic focus or pathway with cardiopulmonary bypass	28.92	48.19	$1,599
33254	Operative tissue ablation and reconstruction of atria, limited (e.g., modified Maze procedure)	23.71	40.29	$1,303
33255	Operative tissue ablation and reconstruction of atria, extensive (e.g., Maze procedure); without cardiopulmonary bypass	29.04	48.00	$1,553
33256	Operative tissue ablation and reconstruction of atria, extensive (e.g., Maze procedure); with cardiopulmonary bypass	34.90	56.80	$1,837
+33257	Operative tissue ablation and reconstruction of atria, performed at the time of other cardiac procedure(s), limited (e.g., modified Maze procedure)	9.63	17.36	$562
+33258	Operative tissue ablation and reconstruction of atria, performed at the time of other cardiac procedure(s), extensive (e.g., Maze procedure); without cardiopulmonary bypass	11.00	19.27	$623
+33259	Operative tissue ablation and reconstruction of atria, performed at the time of other cardiac procedure(s), extensive (e.g., Maze procedure); with cardiopulmonary bypass	14.14	25.20	$815
CABG				
33533	Coronary artery bypass, using arterial graft(s); single arterial graft	33.75	55.31	$1,789
33534	Coronary artery bypass, using arterial graft(s); 2 arterial grafts	39.88	64.97	$2,102
33535	Coronary artery bypass, using arterial graft(s); 3 arterial grafts	44.75	72.17	$2,334
33536	Coronary artery bypass, using arterial graft(s); 4 or more arterial grafts	48.43	77.74	$2,515

* Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

**The facility payment is the physician's professional fee in a facility setting. Average national rates are unadjusted by Geography Practice Cost Index. Payment rates reflect a conversion factor of $32.3465 (effective 01/01/2025) multiplied by the total relative value units (RVUs).

+Indicates a secondary add-on procedure code to be listed with primary procedure code.

Limited operative ablation: Surgical isolation of triggers of supraventricular dysrhythmias by operative ablation that isolates the pulmonary veins or other anatomically defined triggers in the left or right atrium.

Extensive operative ablation: Services in limited ablation definition and additional ablation of atrial tissue to eliminate supraventricular dysrhythmias. This must include operative ablation that involves either the right atrium, the atrial septum or left atrium in continuity with the atrioventricular annulus.

Inpatient Facility Coding and Reimbursement

The site of service depends on the patient's chief complaint, clinical presentation and is solely determined by the admitting physician. The ICD-10-CM Diagnosis Code(s) and primary ICD-10-PCS determine the MS-DRG (Medicare Severity-Diagnosis-Related Group).

Table 2. Open-Chest Surgical Ablation Inpatient Facility Coding and Reimbursement

MS-DRG†	Description	FY 2025 Weighing System	FY 2025 Arithmetic Mean LOS	FY 2025 Inpatient Prospective Payment System
CABG				
231	Coronary bypass with PTCA with MCC	8.47	12.5	$60,305
232	Coronary bypass with PTCA without MCC	6.11	8.6	$43,473
233	Coronary bypass with cardiac catheterization or open ablation with MCC	7.82	12.7	$55,625
234	Coronary bypass with cardiac catheterization or open ablation without MCC	5.32	8.7	$37,862
235	Coronary bypass without cardiac catheterization with MCC	5.88	9.3	$41,875
236	Coronary bypass without cardiac catheterization without MCC	4.11	6.2	$29,264

†FY 2025 Medicare Inpatient rates based upon Final Rule release. Conversion Factor = $7,117.02.

CC = comorbidity or complication, MCC = major complication or comorbidity, w/o = without, PTCA = percutaneous transluminal coronary angioplasty

Valve Procedures

Physician Coding and Reimbursement

CPT codes describe the procedures performed during the patient visit. CPT codes that may be appropriate for procedures used in conjunction with valve procedures are included below.

Table 3. Valve Procedures Physician Coding and Reimbursement

CPT*	Description	CY 2025 Physician Work Relative Value Units (RVUs)	CY 2025 Physician Total RVU	CY 2025 National Payment Rate **
Mitral Valve Surgery				
33420	Valvotomy mitral valve; closed heart	25.79	42.85	$1,386
33422	Valvotomy mitral valve; open heart, with cardiopulmonary bypass	29.73	49.13	$1,589
33425	Valvuloplasty, mitral valve, with cardiopulmonary bypass	49.96	80.37	$2,600
33426	Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring	43.28	70.34	$2,275
33427	Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring	44.83	71.89	$2,325
33430	Replacement, mitral valve, with cardiopulmonary bypass	50.93	82.66	$2,674
Aortic Valve Surgery				
33390	Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; simple (i.e., valvotomy, debridement, debulking, and/or simple commissural resuspension	35.00	56.83	$1,838
33391	Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; complex (e.g., leaflet extension, leaflet resection, leaflet reconstruction, or annuloplasty)	41.50	67.35	$2,179
33405	Replacement, aortic valve, open, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve	41.32	66.98	$2,167
33406	Replacement, aortic valve, open, with cardiopulmonary bypass with allograft valve (freehand)	52.68	85.03	$2,750
33410	Replacement, aortic valve, open, with cardiopulmonary bypass with stentless tissue valve	46.41	75.10	$2,429
33411	Replacement, aortic valve; with aortic annulus enlargement, noncoronary sinus	62.07	98.72	$3,193
33412	Replacement, aortic valve with transventricular aortic annulus enlargement (Konno procedure)	59.00	92.30	$2,986
33413	Replacement, aortic valve; by translocation of autologous pulmonary valve with allograft replacement of pulmonary valve (Ross procedure)	59.87	94.62	$3,061

*Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

**The facility payment is the physician's professional fee in a facility setting. Average national rates are unadjusted by Geography Practice Cost Index. Payment rates reflect a conversion factor of $32.3465 (effective 01/01/2025) multiplied by the total relative value units (RVUs).

Inpatient Facility Coding and Reimbursement

The site of service depends on the patient's chief complaint, clinical presentation and is solely determined by the admitting physician. The ICD-10-CM Diagnosis Code(s) and primary ICD-10-PCS determine the MS-DRG.

Table 4. Valve Procedures Inpatient Facility Coding and Reimbursement

MS-DRG†	Description	FY 2025 Weighing System	FY 2025 Arithmetic Mean LOS	FY 2025 Inpatient Prospective Payment System
Cardiac Valve				
212	Concomitant aortic and mitral valve procedures (three procedures must be met)	10.89	15.5	$77,526
216	Cardiac valve and other major cardiothoracic procedures with cardiac catheterization with MCC	9.65	13.9	$68,682
217	Cardiac valve and other major cardiothoracic procedures with cardiac catheterization with CC	6.46	7.1	$45,957
218	Cardiac valve and other major cardiothoracic procedures with cardiac catheterization without CC/MCC	5.95	3.3	$42,340
219	Cardiac valve and other major cardiothoracic procedures without cardiac catheterization with MCC	7.74	10.5	$55,064
220	Cardiac valve and other major cardiothoracic procedures without cardiac catheterization with CC	5.30	6.3	$37,694
221	Cardiac valve and other major cardiothoracic procedures without cardiac catheterization without CC/MCC	4.59	3.8	$32,683

†FY 2025 Medicare Inpatient rates based upon Final Rule release. Conversion Factor = $7,117.02.

CC = comorbidity or complication, MCC = major complication or comorbidity, w/o = without.

Physician Coding and Reimbursement

CPT codes describe the procedures performed during the patient visit. CPT codes that may be appropriate for procedures used in conjunction with minimally invasive procedures are included below.

Table 5. Minimally Invasive Procedure Physician Coding and Reimbursement

CPT*	Description	CY 2025 Physician Work Relative Value Units (RVUs)	CY 2025 Physician Total RVU	CY 2025 National Payment Rate **
Cardiac Surgical Ablation				
33265	Endoscopy, surgical; operative tissue ablation and reconstruction of atria, limited (e.g., modified Maze procedure); without cardiopulmonary bypass	23.71	40.37	$1,306
33266	Endoscopy, surgical; operative tissue ablation and reconstruction of atria, extensive (e.g., Maze procedure); without cardiopulmonary bypass	33.04	54.44	$1,761
Electrophysiology Cardiac Ablation, Percutaneous LAAM and Select Imaging Studies				
93653	Comprehensive electrophysiologic evaluation with insertion and repositioning of multiple electrode catheters, induction or attempted induction of an arrhythmia with right atrial pacing and recording and catheter ablation of arrhythmogenic focus, including intracardiac electrophysiologic 3-dimensional mapping, right ventricular pacing and recording, left atrial pacing and recording from coronary sinus or left atrium, and His bundle recording, when performed; with treatment of supraventricular tachycardia by ablation of fast or slow atrioventricular pathway, accessory atrioventricular connection, cavo-tricuspid isthmus or other single atrial focus or source of atrial re-entry	15.00	24.46	$791
93654	Comprehensive electrophysiologic evaluation with insertion and repositioning of multiple electrode catheters, induction or attempted induction of an arrhythmia with right atrial pacing and recording and catheter ablation of arrhythmogenic focus, including intracardiac electrophysiologic 3-dimensional mapping, right ventricular pacing and recording, left atrial pacing and recording from coronary sinus or left atrium, and His bundle recording, when performed; with treatment of ventricular tachycardia or focus of ventricular ectopy including left ventricular pacing and recording, when performed	18.10	29.48	$954
+93655	Intracardiac catheter ablation of a discrete mechanism of arrhythmia which is distinct from the primary ablated mechanism, including repeat diagnostic maneuvers, to treat a spontaneous or induced arrhythmia	5.50	8.98	$290
93656	Comprehensive electrophysiologic evaluation with transseptal catheterizations, insertion and repositioning of multiple electrode catheters, induction or attempted induction of an arrhythmia including left or right atrial pacing/recording, and intracardiac catheter ablation of atrial fibrillation by pulmonary vein isolation, including intracardiac electrophysiologic 3-dimensional mapping, intracardiac echocardiography with imaging supervision and interpretation, right ventricular pacing/recording, and His bundle recording, when performed	17.00	27.72	$897
+93657	Additional linear or focal intracardiac catheter ablation of the left or right atrium for treatment of atrial fibrillation remaining after completion of pulmonary vein isolation	5.50	8.99	$291

*Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

**The facility payment is the physician's professional fee in a facility setting. Average national rates are unadjusted by Geography Practice Cost Index. Payment rates reflect a conversion factor of $32.3465 (effective 01/01/2025) multiplied by the total relative value units (RVUs).

+Indicates a secondary add-on procedure code to be listed with primary procedure code.

Limited operative ablation: Surgical isolation of triggers of supraventricular dysrhythmias by operative ablation that isolates the pulmonary veins or other anatomically defined triggers in the left or right atrium.

Extensive operative ablation: Services in limited ablation definition and additional ablation of atrial tissue to eliminate supraventricular dysrhythmias. This must include operative ablation that involves either the right atrium, the atrial septum or left atrium in continuity with the atrioventricular annulus.

Inpatient Facility Coding and Reimbursement

The site of service depends on the patient's chief complaint, clinical presentation and is solely determined by the admitting physician. The ICD-10-CM Diagnosis Code(s) and primary ICD-10-PCS determine the MS-DRG.

Table 6. Minimally Invasive Procedure Inpatient Facility Coding and Reimbursement

MS-DRG†	Description	FY 2025 Weighing System	FY 2025 Arithmetic Mean LOS	FY 2025 Inpatient Prospective Payment System
Cardiac Surgical Ablation				
228	Other cardiothoracic procedures with MCC	4.98	8.8	$35,463
229	Other cardiothoracic procedures without MCC	3.11	3.3	$22,106
317	Concomitant left atrial appendage closure and cardiac ablation	6.19	3.0	$44,026
Percutaneous Catheter Ablation				
273	Percutaneous intracardiac procedures with MCC	3.91	5.4	$27,828
274	Percutaneous intracardiac procedures without MCC	3.12	1.4	$22,211

†FY 2025 Medicare Inpatient rates based upon Final Rule release. Conversion Factor = $7,117.02.

CC = comorbidity or complication, MCC = major complication or comorbidity, w/o = without.

Percutaneous approach: A procedure performed via a percutaneous approach (character value 3) is one in which there is entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach the site of the procedure.

Outpatient Hospital Reimbursement

CPT codes describe the procedures performed during the patient visit. CPT codes that may be appropriate for procedures used in conjunction with minimally invasive procedures are included below.

Table 7. Minimally Invasive Procedure Outpatient Hospital Coding and Reimbursement

CPT*	Description	CY 2025 Comprehensive APC*	CY 2025 APC Title	CY 2025 Medicare National Standardized APC Payment (HOPPS)
Percutaneous Catheter Ablation				
93653	Comprehensive electrophysiologic evaluation with insertion and repositioning of multiple electrode catheters, induction or attempted induction of an arrhythmia with right atrial pacing and recording and catheter ablation of arrhythmogenic focus, including intracardiac electrophysiologic 3-dimensional mapping, right ventricular pacing and recording, left atrial pacing and recording from coronary sinus or left a trium, and His bundle recording, when performed; with treatment of supraventricular tachycardia by ablation of fast or slow atrioventricular pathway, accessory atrioventricular connection, cavo-tricuspid isthmus or other single atrial focus or source of atrial re-entry	5213	Level 3 EP Procedure	$24,532
93654	Comprehensive electrophysiologic evaluation with insertion and repositioning of multiple electrode catheters, induction or attempted induction of an arrhythmia with right atrial pacing and recording and catheter ablation of arrhythmogenic focus, including intracardiac electrophysiologic 3-dimensional mapping, right ventricular pacing and recording, left atrial pacing and recording from coronary sinus or left atrium, and His bundle recording, when performed; with treatment of ventricular tachycardia or focus of ventricular ectopy including left ventricular pacing and recording, when performed			
93656	Comprehensive electrophysiologic evaluation with transseptal catheterizations, insertion and repositioning of multiple electrode catheters, induction or attempted induction of an arrhythmia including left or right atrial pacing/recording, and intracardiac catheter ablation of atrial fibrillation by pulmonary vein isolation, including intracardiac electrophysiologic 3-dimensional mapping, intracardiac echocardiography with imaging supervision and interpretation, right ventricular pacing/recording, and His bundle recording, when performed			

*Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

Percutaneous approach: A procedure performed via a percutaneous approach (character value 3) is one in which there is entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach the site of the procedure.

Healthcare Common Procedure Coding System (HCPCS) that may be appropriate for procedures used in conjunction with minimally invasive procedures to gain access in the outpatient setting are listed below.

Table 8. Minimally Invasive Procedure Access Outpatient Hospital Coding

HCPCS	Description
C1889	Implantable/insertable device, not otherwise classified

Packaged service/item; no separate payment made.

Physician Coding and Reimbursement

CPT codes describe the procedures performed during the patient visit. CPT codes that may be appropriate for procedures used in conjunction with LAAM are included below.

Table 9. LAAM Physician Coding and Reimbursement

CPT*	Description	CY 2025 Physician Work Relative Value Units (RVUs)	CY 2025 Physician Total RVU	CY 2025 National Payment Rate**
Surgical LAAM and Select Imaging Studies				
‡33267	Exclusion of left atrial appendage, open, any method	18.50	30.97	$1,002
+33268	Exclusion of left atrial appendage, concomitant, any method‡	2.50	3.81	$123
‡33269	Exclusion of left atrial appendage, thoracoscopic, any method	14.31	24.68	$798
93312.26	Transesophageal echocardiogram; complete	2.30	3.12	$101
+93662.26	Intracardiac echocardiography during therapeutic/diagnostic intervention	1.44	2.06	$67

*Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

**The facility payment is the physician's professional fee in a facility setting. Average national rates are unadjusted by Geography Practice Cost Index. Payment rates reflect a conversion factor of $32.3465 (effective 01/01/2025) multiplied by the total relative value units (RVUs).

+Indicates a secondary add-on procedure code to be listed with primary procedure code.

‡Atrial appendage ligation, plication, or AtriClip is included in mitral valve and Maze procedures and should not be reported separately when performed in the same session as these procedures.

Open approach: An open approach is defined as cutting through the skin or mucous membrane and any other body layers necessary to expose the site of the procedure.

Inpatient Facility Coding and Reimbursement

The site of service depends on the patient's chief complaint, clinical presentation and is solely determined by the admitting physician. The ICD-10-CM Diagnosis Code(s) and primary ICD-10-PCS determine the MS-DRG.

Table 10. LAAM Inpatient Facility Coding and Reimbursement

MS-DRG†	Description	FY 2025 Weighing System	FY 2025 Arithmetic Mean LOS	FY 2025 Inpatient Prospective Payment System
LAAM Absent Ablation or Structural Heart Procedure				
273	Percutaneous intracardiac procedures with MCC	3.91	5.4	$27,828
274	Percutaneous intracardiac procedures without MCC	3.12	1.4	$22,211

†FY 2025 Medicare Inpatient rates based upon Final Rule release. Conversion Factor = $7,117.02.

CC = comorbidity or complication, MCC = major complication or comorbidity, w/o = without.

Percutaneous approach: A procedure performed via a percutaneous approach (character value 3) is one in which there is entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach the site of the procedure.

Arrhythmia Reimbursement Resources

This information is shared for educational purposes only and based upon available information consistent with American Medical Association, Centers for Medicare and Medicaid Service (CMS) and/or professional society decisions about post-operative analgesia. AtriCure believes this information to be correct, but encourages HCPs to check with their payers with any questions about coding, coverage and/or professional society decisions about arrhythmia management.

Table 11. Common ICD-10 Codes Used During LAAM, Cardiac Surgery and Electrophysiology Ablation Procedures

ICD-10 CM	Diagnosis Description
I47.1	Supra ventricular tachycardia
I47.11	Inappropriate sinus tachycardia, so stated
I48.0	Paroxysmal atrial fibrillation
I48.1	Persistent atrial fibrillation
I48.11	Longstanding persistent atrial fibrillation
I48.19	Other persistent atrial fibrillation
I48.2	Chronic atrial fibrillation
I48.20	Chronic atrial fibrillation, unspecified
I48.21	Permanent atrial fibrillation
I48.3	Typical atrial flutter
I48.4	Atypical atrial flutter
I48.91	Unspecified atrial fibrillation
I48.92	Unspecified atrial flutter
I49.8	Other specified cardiac arrhythmias
G90.A	Postural orthostatic tachycardia syndrome (POTS)
R00.0	Tachycardia unspecified
R55	Syncope and collapse
ICD-10 PCS	**Procedure Description**
02563ZZ	Destruction of right atrium, percutaneous
02564ZZ	Destruction of right atrium, percutaneous endoscopic
02560ZZ	Destruction of right atrium, open
02573ZZ	Destruction of left atrium, percutaneous
02574ZZ	Destruction of left atrium, percutaneous endoscopic
02570ZZ	Destruction of left atrium, open
02583ZZ	Destruction, conduction mechanism, percutaneous
02584ZZ	Destruction, conduction mechanism, percutaneous endoscopic
02580ZZ	Destruction, conduction mechanism, open
025S0ZZ	Destruction of right pulmonary vein, open
025S3ZZ	Destruction of right pulmonary vein, percutaneous
025S4ZZ	Destruction of right pulmonary vein, percutaneous endoscopic
025T0ZZ	Destruction of left pulmonary vein, open
025T3ZZ	Destruction of left pulmonary vein, percutaneous
025T4ZZ	Destruction of left pulmonary vein, percutaneous endoscopic
02B70ZK	Excision of left atrial appendage, open
02B73ZK	Excision of left atrial appendage, percutaneous
02B74ZK	Excision of left atrial appendage, percutaneous endoscopic
02L73DK	Occlusion of left atrial appendage with intraluminal device, percutaneous
02L74DK	Occlusion of left atrial appendage with intraluminal device, percutaneous endoscopic
02L73ZK	Occlusion of left atrial appendage, percutaneous
02L74ZK	Occlusion of left atrial appendage, percutaneous endoscopic
02L70CK	Occlusion of left atrial appendage with extraluminal device, open
02L73CK	Occlusion of left atrial appendage with extraluminal device, percutaneous
02L74CK	Occlusion of left atrial appendage with extraluminal device, percutaneous endoscopic

Open approach: An open approach is defined as cutting through the skin or mucous membrane and any other body layers necessary to expose the site of the procedure.

Percutaneous approach: A procedure performed via a percutaneous approach (character value 3) is one in which there is entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach the site of the procedure.

Percutaneous endoscopic approach: Percutaneous endoscopic approach (character value 4) is defined as entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach and visualize the site of the procedure.

Table 12. Additional Physician Coding and Reimbursement

CPT*	Description	CY 2025 Physician Work Relative Value Units (RVUs)	CY 2025 Physician Total RVU	CY 2025 National Payment Rate **
Electrophysiology Cardiac Ablation, Percutaneous LAAM and Select Imaging Studies				
33340	Percutaneous transcatheter closure of the left atrial appendage with endocardial implant, including fluoroscopy, transseptal puncture, catheter placement, left atrial angiography, left atrial appendage angiography, when performed, and radiological supervision and interpretation	14.00	22.87	$740
33999	Unlisted procedure, cardiac surgery	At payer discretion		
93312.26	Transesophageal echocardiogram; complete	2.30	3.12	$101
+93462	Left heart catheterization by transseptal puncture through intact septum or by transapical puncture	3.73	6.06	$196
93600.26	Bundle of His recording	2.12	3.38	$109
93602.26	Intracardiac recording	2.12	3.34	$108
93603.26	Right ventricular pacing and recording	2.12	3.34	$108
+93613	Intracardiac EP 3-dimensional mapping	5.23	8.51	$275
93621.26	With left atrial pacing and recording from coronary sinus or left atrium	1.50	2.39	$77
93622.26	With left ventricular pacing and recording	3.10	4.96	$160
93631.26	Intra-operative epicardial and endocardial pacing and mapping to localize the site of tachycardia or zone of slow conduction for surgical correction	7.59	11.46	$371
+93662.26	Intracardiac echocardiography during therapeutic/diagnostic intervention	1.44	2.06	$67

*Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

**The facility payment is the physician's professional fee in a facility setting. Average national rates are unadjusted by Geography Practice Cost Index. Payment rates reflect a conversion factor of $32.3465 (effective 01/01/2025) multiplied by the total relative value units (RVUs).

+Indicates a secondary add-on procedure code to be listed with primary procedure code.

Percutaneous approach: A procedure performed via a percutaneous approach (character value 3) is one in which there is entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach the site of the procedure.

Additional Reimbursement Resources

Minimally Invasive Surgical Hybrid Ablation Procedures- Case Pre-Authorization and Denials Checklist

Level 1 Appeals Letter

cryoNB Medical Necessity Leave-Behind: RE-US-2895B-1225-G

Convergent Pre-Authorization Checklist: RE-US-1043E-1225-G

Letter of Medical Necessity/Level 1 Appeal–Cryoablation: RE-US-3822A-1225-G

Level 1 Appeal Template–Convergent/Hybrid: RE-US-3823A-1225-G

Reimbursement Hotline

Contact: Julie Garfield

Hotline Hours of Operation: Monday-Friday, 8 a.m.-5 p.m. MT

C: **1 (303) 845-2027** (phone or text)

E: **JGarfield@InSearch-Solutions.com**

Cryoablation

This information is shared for educational purposes only and based upon available information consistent with American Medical Association, Centers for Medicare and Medicaid Service (CMS) and/or professional society decisions about post-operative analgesia. AtriCure believes this information to be correct, but encourages HCPs to check with their payers with any questions about coding, coverage and/or reimbursement for post-operative analgesia.

Physician's Professional Fee

The cryoSPHERE probes may be requested by a cardiac and/or thoracic surgeon, when performing open and endoscopic procedures, such as, but not limited to the following considerations:

Table 13. Cryoablation Physician Coding and Reimbursement

CPT*	Description	Physician Work RVUs	Total Physician RVUs	2025 CMS Payment
Primary Surgical Procedures may include, but not limited to:				
21743	Reconstructive repair of pectus excavatum or carinatum; minimally invasive approach (Nuss), with thoracoscopy	Contractor priced		
21811	Open treatment of rib fracture(s) with internal fixation, includes thoracoscopic visualization when performed, unilateral; 1-3 ribs	10.79	17.70	$573
21812	Open treatment of rib fracture(s) with internal fixation, includes thoracoscopic visualization when performed, unilateral; 4-6 ribs	13.00	21.43	$693
21813	Open treatment of rib fracture(s) with internal fixation, includes thoracoscopic visualization when performed, unilateral; 7 or more ribs	17.61	29.36	$950
32480	Removal of lung, other than pneumonectomy; single lobe (lobectomy)	25.82	43.92	$1,421
32505	Thoracotomy; with therapeutic wedge resection (e.g., mass, nodule), initial	15.75	27.75	$898
32663	Thoracoscopy, surgical; with lobectomy (single lobe)	24.64	41.44	$1,340
32666	Thoracoscopy, surgical with therapeutic wedge resection (e.g., mass, nodule), initial unilateral	14.50	25.94	$839

Per the American Medical Association's CPT Education and Information Services, CPT 64999 should be reported when cryotherapy/cryoablation/cryoanalgesia/cryoneuromodulation is performed.

64999	Unlisted procedure, nervous system	Contractor priced

*Source: American Medical Association. CPT 2025 Professional Edition. CPT® is a registered trademark of the American Medical Association.

Inpatient Facility Coding and Reimbursement

The site of service depends on the patient's chief complaint, clinical presentation and is solely determined by the admitting physician. The ICD-10-CM Diagnosis Code(s) and primary ICD-10-PCS determine the MS-DRG. The primary surgical procedure determines the clinically relevant MS-DRG or Ambulatory Payment Classification (APC). The cryoSPHERE cryoablation probe is a single use disposable patient care item used in the operating room and may be included in a range of cardiothoracic procedures grouped to the following MS-DRGs, such as, but not limited to:

Table 14. Cryoablation Inpatient Facility Coding and Reimbursement

MS-DRG§	Description	Weights	Geometric mean LOS	Arithmetic mean LOS	2025 CMS Payment
163	Major chest procedure with MCC	4.61	6.8	9.4	$32,802
164	Major chest procedure with CC	2.52	3.5	4.5	$17,912
165	Major chest procedure with w/o CC/MCC	1.86	2.1	2.5	$13,265
166	Other respiratory system O.R. procedures with MCC	3.85	7.9	11.2	$27,408
167	Other respiratory system O.R. procedures with CC	1.83	3.4	4.7	$13,004
168	Other respiratory system O.R. procedures without CC/MCC	1.35	1.9	2.3	$9,635
515	Other musculoskeletal system and connective tissue O.R. procedure with MCC	3.09	6.8	8.6	$22,007
516	Other musculoskeletal system and connective tissue O.R. procedure with CC	2.01	3.9	4.9	$14,317
517	Other musculoskeletal system and connective tissue O.R. procedure without CC/MCC	1.49	2.3	2.9	$10,623

§Optum 360. DRG Expert 2025.
CC = comorbidity or complication, MCC = major complication or comorbidity, w/o = without.

Outpatient Hospital Reimbursement

Table 15. Cryoablation Outpatient Facility Coding and Reimbursement

HCPCS	Description	FY2025 Outpatient Prospective Payment System
C9808	Cryo Nerve Block Therapy	$985.94

Hospitals need to update their claim form with C9808 code to receive payment.
C9808 - Nerve cryoablation probe (e.g., cryoICE, cryoSPHERE, cryoSPHERE MAX, cryoICE cryoSPHERE, cryoICE Cryo2), including probe and all disposable system components, non-opioid medical device (must be a qualifying Medicare non-opioid medical device for postsurgical pain relief in accordance with Section 4135 of the CAA, 2023).

Procedure Descriptions

Table 16. Cryoablation Procedure Descriptions

ICD-10	PCS
01580ZZ	Destruction of thoracic nerve, open approach
01584ZZ	Destruction of thoracic nerve, percutaneous endoscopic approach

Open approach: An open approach is defined as cutting through the skin or mucous membrane and any other body layers necessary to expose the site of the procedure.
Percutaneous endoscopic approach: Percutaneous endoscopic approach (character value 4) is defined as entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach and visualize the site of the procedure.

Cryoablation Reimbursement Resources

Table 17. Common Cryoablation Coding

Description	
Open Cases	
01580ZZ	Destruction of thoracic nerve, open approach
64999	Unlisted procedure, nervous system
VATS/Percutaneous Endoscopic Cases	
01584ZZ	Destruction of thoracic nerve, percutaneous endoscopic
64999	Unlisted procedure, nervous system
Diagnosis	
G89.12	Acute post-thoracotomy pain
G89.19	Other acute post procedural pain

VATS = video-assisted thoracic surgery
Open approach: An open approach is defined as cutting through the skin or mucous membrane and any other body layers necessary to expose the site of the procedure.
Percutaneous endoscopic approach: Percutaneous endoscopic approach (character value 4) is defined as entry, by puncture or minor incision, of instrumentation through the skin or mucous membrane and any other body layers necessary to reach and visualize the site of the procedure.

Additional Reimbursement Resources

Medical Necessity Leave-Behind Document

Letter of Medical Necessity/Level 1 Appeals Letter

Reimbursement Hotline

Contact: Julie Garfield

Hotline Hours of Operation: Monday-Friday, 8 a.m.-5 p.m. MT

C: **1 (303) 845-2027** (phone or text)

E: **JGarfield@InSearch-Solutions.com**

U.S Indications

Isolator Synergy Clamps (EML2; EMR2): *The AtriCure Bipolar (Transpolar) System is intended to ablate soft tissue during general surgical procedures.*

Isolator Synergy Clamp (EMT1): *The AtriCure Bipolar (Transpolar) System is intended to ablate cardiac tissue during surgery.*

Isolator Synergy Clamps (OLL2/OSL2): *The AtriCure Synergy Ablation System is intended to ablate cardiac tissue for the treatment of persistent atrial fibrillation (sustained beyond seven days, or lasting less than seven days but necessitating pharmacologic or electrical cardioversion) or longstanding persistent atrial fibrillation (continuous atrial fibrillation of greater than one year duration) in patients who are undergoing open concomitant coronary artery bypass grafting and/or valve replacement or repair.*

Isolator Synergy EnCompass Clamp: *The AtriCure Isolator Synergy EnCompass Clamp and Guide system is intended to ablate cardiac tissue during surgery.*

The safety and effectiveness of this device for the treatment of atrial fibrillation has not been established.

Please review the Instructions for Use for a complete listing of contraindications, warnings, precautions, and potential adverse events prior to using these devices.

Coolrail Linear Pen: *The Coolrail Linear Pen is a sterile, single use electrosurgery device intended to ablate cardiac tissue during cardiac surgery using RF energy.*

Isolator Linear Pen: *The Isolator Linear Pen is a sterile, single use electrosurgery device intended to ablate cardiac tissue during cardiac surgery using RF energy when connected directly to the ASU/ASB or MAG in Ablation mode. The Isolator linear pen may be used for temporary cardiac pacing, sensing, recording, and stimulation during the evaluation of cardiac arrhythmias during surgery when connected to a temporary external cardiac pacemaker or recording device.*

Isolator Transpolar Pen: *The Isolator Transpolar Pen is a sterile, single use electrosurgery device intended to ablate cardiac tissue during cardiac surgery using radiofrequency (RF) energy when connected directly to the ASU or to the ASU Source Switch in Ablation mode.*

When the Pen is connected to the ASU Source Switch in Auxiliary mode, it may be used for temporary cardiac sensing, recording, stimulation, and temporary pacing during the evaluation of cardiac arrhythmias.

Please review the Instructions for Use for a complete listing of contraindications, warnings, precautions and potential adverse events prior to using these devices.

cryoICE Probe (CRYO2): ***For Adult Patients:*** *AtriCure's CRYO2 cryoICE cryoablation probes are sterile, single use devices intended for use in the cryosurgical treatment of cardiac arrhythmias by freezing target tissues, creating an inflammatory response (cryonecrosis) that blocks the electrical conduction pathway. The CRYO2 cryoICE cryo-ablation probes are also intended for use to temporarily block pain by ablating peripheral nerves.* ***For Adolescent Patients:*** *The CRYO2 cryoICE cryo-ablation probes are intended for use to temporarily block pain by ablating intercostal nerves under direct visualization[1] in adolescent patients of at least 12 years of age.*

[1]Direct visualization, in this context, requires that the surgeon is able to see the targeted tissue for cryoablation directly or with assistance from a camera, endoscope or other similar optical technology.

cryoICE Probe (CRYO3): *AtriCure's cryoICE cryoablation probe is indicated for use in the cryosurgical treatment of cardiac arrhythmias. The probe freezes target tissues, creating an inflammatory response (cryonecrosis) that blocks the electrical conduction pathway.*

cryoFORM Probe: *The cryoICE cryoFORM cryoablation probe is indicated for use in the cryosurgical treatment of cardiac arrhythmias by freezing target tissues, creating an inflammatory response (cryonecrosis) that blocks the electrical conduction pathway.*

cryoSPHERE Probe: ***For Adult Patients:*** *AtriCure's cryoICE cryoSPHERE cryoablation probes are sterile, single use devices intended for use performed by freezing target tissues, creating an inflammatory response (cryonecrosis) for blocking pain by temporarily ablating peripheral nerves.* ***For Adolescent Patients:*** *The cryoICE cryoSPHERE cryo-ablation probes are intended for use to temporarily block pain by ablating intercostal nerves under direct visualization[1] in adolescent patients of at least 12 years of age.*

[1]Direct visualization, in this context, requires that the surgeon is able to see the targeted tissue for cryoablation directly or with assistance from a camera, endoscope or other similar optical technology.

cryoSPHERE+ Probe: ***For Adult Patients:*** *AtriCure's cryoICE cryoSPHERE+ cryoablation probes are intended for use to temporarily block pain by ablating peripheral nerves performed by freezing target tissues, creating an inflammatory response (cryonecrosis).* ***For Adolescent Patients:*** *The cryoICE cryoSPHERE+ cryoablation probes are intended for use to temporarily block pain by ablating intercostal nerves under direct visualization[1] in adolescent patients of at least 12 years of age.*

[1]Direct visualization, in this context, requires that the surgeon is able to see the targeted tissue for cryoablation directly or with assistance from a camera, endoscope or other similar optical technology.

cryoSPHERE MAX Probe: ***For Adult Patients:*** *AtriCure's cryoICE cryoSPHERE MAX cryoablation probes are intended for use to temporarily block pain by ablating peripheral nerves performed by freezing target tissues, creating an inflammatory response (cryonecrosis).* ***For Adolescent Patients:*** *The cryoICE cryoSPHERE MAX cryoablation probes are intended for use to temporarily block pain by ablating intercostal nerves under direct visualization[1] in adolescent patients of at least 12 years of age.*

[1]Direct visualization, in this context, requires that the surgeon is able to see the targeted tissue for cryoablation directly or with assistance from a camera, endoscope or other similar optical technology.

AtriClip LAA Exclusion System: *The AtriClip LAA Exclusion System is indicated for the exclusion of the left atrial appendage, performed under direct visualization[1], in conjunction with other cardiac surgical procedures.*

[1]Direct visualization, in this context, requires that the surgeon is able to see the heart directly, with or without assistance from a camera, endoscope, etc., or other appropriate viewing technologies.

EPi-Sense Coagulation device/EPi-Sense ST Coagulation device: *The EPi-Sense Coagulation System/EPi-Sense ST™ Coagulation Device is intended for the treatment of symptomatic long-standing persistent atrial fibrillation (continuous atrial fibrillation greater than 12 months duration) when augmented in a hybrid procedure with an endocardial catheter listed in the instructions for use, in patients (1) who are refractory or intolerant to at least one Class I and/or III antiarrhythmic drug (AAD); and (2) in whom the expected benefit from rhythm control outweighs the potential known risks associated with a hybrid procedure such as delayed post-procedure inflammatory pericardial effusions.* ***Contraindications:*** *include patients with Barrett's Esophagitis, left atrial thrombus, a systemic infection, active endocarditis, or a localized infection at the surgical site at the time of surgery.* ***Adverse Events:*** *Reported adverse events associated with epicardial ablation procedure may include, but are not limited to, the following: pericardial effusion/cardiac tamponade, pericarditis, excessive bleeding, phrenic nerve injury, stroke/TIA/neurologic complication.* ***Warnings:*** *Physicians should consider post-operative anti-inflammatory medication to decrease the potential for post-operative pericarditis. and/or delayed post-procedure inflammatory pericardial effusions. Physicians should consider post-procedural imaging (i.e. 1-3 weeks post-procedure) for detection of post-procedure inflammatory pericardial effusions.* ***Precautions:*** *Precautionary measures should be taken prior to considering treatment of patients: (1) Deemed to be high risk and who may not tolerate a potential delayed post-procedure inflammatory pericardial effusion. (2) Who may not be compliant with needed follow-ups to identify potential safety risks. To ensure patients undergoing treatment with the EPi-Sense/EPi-Sense ST device are well informed, the benefits, potential risks and procedural outcomes associated with the EPi-Sense/EPi-Sense ST Hybrid Convergent procedure should be discussed with the patient. Physicians should document accordingly in the medical record. Qualified operators are physicians authorized by their institution to perform surgical sub-xyphoid pericardial access. The coagulation devices should be used by physicians trained in the techniques of minimally invasive endoscopic surgical procedures and in the specific approach to be used. Operators should undergo training on the use of EPi-Sense/EPi-Sense ST device before performing the procedure. Safety and effectiveness of concomitant left atrial appendage closure was not evaluated in the CONVERGE study. Follow-up should be conducted at approximately 30 days post procedure to monitor for signs of delayed onset pericarditis or pericardial effusion.*

EPi-Ease: *The EPi-Ease Epicardial Access System (EAS) is intended to access the epicardial surface of the heart via a subxiphoid approach.*

Rx Only.

Peer-Reviewed Literature

Clinical evidence in support of surgical cardiac ablation, left atrial appendage surgical closure, and cryoablation includes, but is not limited to, the following peer-reviewed publications. Citations are available upon request.

Cardiac Surgical Ablation With/Without Concomitant Cardiac Surgery (CABG, MVR, AVR)

Cardiac Surgical Ablation With/Without Concomitant Cardiac Surgery (CABG, MVR, AVR)

Ad, N., Suri, R.M., Gammie, J.S. et al. (2012). Surgical ablation of atrial fibrillation trends and outcomes in North America. J Thorac Cardiovasc Surg, 144(5):1051-1060. doi:10.1016/j.jtcvs.2012.07.065

Amin, A.K., Billakanty, S.R., Manocchia, M. et al. (2022). Healthcare Utilization and Costs in Patients with Atrial Fibrillation before and after Hybrid Ablation. JAFIB-EP, 15(6):58-62. doi:10.2139/ssrn.4002165

Badhwar, V., Rankin, J.S., Damiano, R.J. Jr. et al. (2017). The Society of Thoracic Surgeons 2017 Clinical Practice Guidelines for the Surgical Treatment of Atrial Fibrillation. Ann Thorac Surg, 103(1):329-341. doi:10.1016/j.athoracsur.2016.10.076

Badhwar, V., Rankin, J.S., Ad, N. et al. (2017). Surgical Ablation of Atrial Fibrillation in the United States: Trends and Propensity Matched Outcomes. Ann Thorac Surg, 104(2):493-500. doi:10.1016/j.athoracsur.2017.05.016

DeLurgio, D.B., Crossen, K.J., Gill, J. et al. (2020). Hybrid Convergent Procedure for the Treatment of Persistent and Long-Standing Persistent Atrial Fibrillation: Results of CONVERGE Clinical Trial. Circ Arrhythm Electrophysiol, 13(12):e009288. doi:10.1161/CIRCEP.120.009288

Doll, N., Weimar, T., Kosior, D.A. et al. (2023). Efficacy and safety of hybrid epicardial and endocardial ablation versus endocardial ablation in patients with persistent and longstanding persistent atrial fibrillation: A randomised, controlled trial. EClinicalMedicine, 61:102052. doi:10.1016/j.eclinm.2023.102052

Gillinov, A.M., Gelijns, A.C., Parides, M.K. et al. (2015). Surgical ablation of atrial fibrillation during mitral-valve surgery. N Engl J Med, 372(15):1399-1409. doi:10.1056/NEJMoa1500528

Musharbash, F.N., Schill, M.R., Sinn, L.A. et al. (2018). Performance of the Cox-maze IV procedure is associated with improved long-term survival in patients with atrial fibrillation undergoing cardiac surgery. J Thorac Cardiovasc Surg, 155(1):159-70. doi:10.1016/j.jtcvs.2017.09.095

Philpott, J.M., Zemlin, C.W., Cox, J.L. et al. (2015). The ABLATE trial: safety and efficacy of Cox Maze-IV using a bipolar radiofrequency ablation system. Ann Thorac Surg, 100(5):1541-1548. doi:10.1016/j.athoracsur.2015.07.006

Rankin, J.S., Lerner, D.J., Braid-Forbes, M.J. et al. (2020). Surgical ablation of atrial fibrillation concomitant to coronary-artery bypass grafting provides cost-effective mortality reduction. J Thorac Cardiovasc Surg, 160(3):675-686. doi:10.1016/j.jtcvs.2019.07.131

Concomitant Cardiac Surgery With Either (CABG, MVR, AVR) and Surgical Left Atrial Appendage Management

Caliskan, E., Sahin, A., Yilmaz, M. et al. (2018). Epicardial left atrial appendage AtriClip occlusion reduces the incidence of stroke in patients with atrial fibrillation undergoing cardiac surgery. Europace, 20(7):e105-e114. doi:10.1093/europace/eux211

Elbadawi, A., Ogunbayo, G.O., Elgendy, I.Y. et al. (2017). Impact of left atrial appendage exclusion on cardiovascular outcomes in patients with atrial fibrillation undergoing coronary artery bypass grafting (From the National Inpatient Sample Database). Am J Cardiol, 120(6):953-958. doi:10.1016/j.amjcard.2017.06.025

Friedman, D.J., Piccini, J.P., Wang, T. et al. (2018). Association between left atrial appendage occlusion and readmission for thromboembolism among patients with atrial fibrillation undergoing concomitant cardiac surgery. JAMA, 319(4):365-374. doi:10.1001/jama.2017.20125

Mehaffey, J.H., Hayanga, J.W.A., Wei, L. et al. (2024). Surgical ablation of atrial fibrillation is associated with improved survival compared with appendage obliteration alone: An analysis of 100,000 Medicare beneficiaries. J Thorac Cardiovasc Surg, 168(1):104-116. doi:10.1016/j.jtcvs.2023.04.021

Park-Hansen, J., Holme, S.J.V., Irmukhamedov, A. et al. (2018). Adding left atrial appendage closure to open heart surgery provides protection from ischemic brain injury six years after surgery independently of atrial fibrillation history: the LAACS randomized study. J Cardiothorac Surg, 13(1):53. doi:10.1186/s13019-018-0740-7

Soltesz, E.G., Dewan, K.C., Anderson, L.H. et al. (2021). Improved outcomes in CABG patients with atrial fibrillation associated with surgical left atrial appendage exclusion. J Card Surg, 36(4):1201-1208. doi:10.1111/jocs.15335

Whitlock, R.P., Belley-Cote, E.P., Paparella, D. et al. (2021). Left atrial appendage occlusion during cardiac surgery to prevent stroke. N Engl J Med, 384(22):2081-2091. doi:10.1056/NEJMoa2101897

Cryoablation

Aiken, T.J., Stahl, C.C., Lemaster, D. et al. (2021). Intercostal nerve cryoablation is associated with lower hospital cost during minimally invasive Nuss procedure for pectus excavatum. J Pediatr Surg, 56(10):1841-1845. doi:10.1016/j.jpedsurg.2020.10.009

Dekonenko, C., Dorman, R.M., Duran, Y. et al. (2020). Postoperative pain control modalities for pectus excavatum repair: A prospective observational study of cryoablation compared to results of a randomized trial of epidural vs patient-controlled analgesia. J Pediatr Surg, 55(8):1444-1447. doi:10.1016/j.jpedsurg.2019.09.021.

Graves, C., Idowu, O., Lee, S. et al. (2017). Intraoperative cryoanalgesia for managing pain after the Nuss procedure. J Pediatr Surg, 52(6):920-924. doi: 10.1016/j.jpedsurg.2017.03.006

Koons, B., Suzuki, Y., Cevasco, M. et al. (2022). Cryoablation in lung transplantation: Its impact on pain, opioid use, and outcomes. JTCVS Open, 13:444-456. doi:10.1016/j.xjon.2022.11.005

Morikawa, N., Laferriere, N., Koo, S. et al. (2018). Cryoanalgesia in patients undergoing Nuss repair of pectus excavatum: Technique modification and early results. J Laparoendosc Adv Surg Tech A, 28(9):1148-1151. doi:10.1089/lap.2017.0665

O'Connor, L.A., Dua, A., Orhurhu, V. et al. (2022). Opioid requirements after intercostal cryoanalgesia in thoracic surgery. J Surg Res, 274:232-241. doi:10.1016/j.jss.2022.01.009

O'Connor, L.A., Houseman, B., Cook, T. et al. (2023). Intercostal cryonerve block versus elastomeric infusion pump for postoperative analgesia following surgical stabilization of traumatic rib fractures. Injury, 54(11):111053. doi:10.1016/j.injury.2023.111053

Additional Sources

CY 2025 Medicare outpatient rates based upon Final Rule release.

FY25 AMA ICD-10 PCS codebook.

Sample/No Cost device: If you received a device as a sample or at no cost, unrelated to a recall, please notify your reimbursement staff. The hospital procedure claim could require additional modifiers or supplemental information to properly account for the reduction in sale price. Please refer to the Medicare claims manual for the most up to date guidance, the following link is provided: **https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/clm104c04.pdf**.

For additional information about the medical necessity of postoperative analgesia, including peer-reviewed literature and payer policies, please reach out to your AtriCure sales professional. For other inquiries or additional information, you can also contact AtriCure's Reimbursement Hotline at **1 (303) 845-2027** (phone or text) or via email at **JGarfield@InSearch-Solutions.com**, or reach out through our website at **www.AtriCure.com/Healthcare-Professionals/Health-Economics-Reimbursement**.

ATRICURE, INC.
7555 Innovation Way
Mason, Ohio 45040 USA
www.AtriCure.com

RE-US-1085J-1225-G

AtriCure