Medical Coverage Policy | Surgical Left Atrial Appendage Occlusion Devices for Stroke Prevention in Atrial Fibrillation

EFFECTIVE DATE: 08|21|2024
POLICY LAST REVIEWED: 09|16|2026

OVERVIEW

Atrial fibrillation (AF) is the most common type of cardiac arrhythmia. Stroke associated with AF is primarily embolic, tends to be more severe than the typical ischemic stroke, and causes higher rates of mortality and disability. As a result, stroke prevention is one of the main goals of AF treatment. Treatment with anticoagulant medications is a first-line approach to stroke prevention in individuals with AF, although occlusion of the left atrial appendage (LAA) may offer a non-pharmacological alternative to anticoagulant medications for those with a contraindication or intolerance to long-term anticoagulant use or with poor anticoagulant adherence. Multiple surgical techniques may be used to excise or occlude the LAA. One device, the AtriClip Left Atrial Appendage Exclusion System, has approval from the U.S. Food and Drug Administration for surgical LAA occlusion for stroke prevention in patients with AF.

MEDICAL CRITERIA

Not applicable

PRIOR AUTHORIZATION

Not applicable

POLICY STATEMENT

Medicare Advantage Plans

The use of surgical left atrial appendage occlusion devices, including the AtriClip device, for stroke prevention in individuals with atrial fibrillation undergoing open or thoracoscopic cardiac procedures is not covered as the evidence is insufficient to determine the effects of the technology on health outcomes.

The use of surgical left atrial appendage occlusion devices, including the AtriClip device, for stroke prevention as a stand-alone procedure for stroke prevention in individuals with atrial fibrillation is not covered as the evidence is insufficient to determine the effects of the technology on health outcomes.

Commercial Products

The use of surgical left atrial appendage occlusion devices, including the AtriClip device, for stroke prevention in individuals with atrial fibrillation undergoing open or thoracoscopic cardiac procedures is not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

The use of surgical left atrial appendage occlusion devices, including the AtriClip device, for stroke prevention as a stand-alone procedure for stroke prevention in individuals with atrial fibrillation is not medically necessary as the evidence is insufficient to determine the effects of the technology on health outcomes.

BACKGROUND

Atrial Fibrillation

Nonvalvular atrial fibrillation (AF) is the most common type of cardiac arrhythmia, affecting at least 2.7 million people in the United States. The risk of AF has been found to be lower in Black, Hispanic, and Asian patients relative to White patients, following adjustment for demographic and AF risk factors. AF is typically described according to frequency and duration and includes paroxysmal (duration up to 1 week), persistent (>1 week), long-term persistent (>1 year), or permanent (normal sinus rhythm cannot be restored despite treatment). Stroke is the most serious complication of AF. The estimated incidence of stroke in non-treated patients with AF is 5% per year. Despite a lower risk of AF, Black and Hispanic patients have an increased

risk of stroke compared with White patients. Although this paradox may be partially attributable to clinical factors (eg, congestive heart failure, hypertension, type 2 diabetes), Black and Hispanic patients with AF are less likely than White patients to receive stroke prevention therapy. Stroke associated with AF is primarily thromboembolic, tends to be more severe than the typical ischemic stroke, and causes higher rates of mortality and disability. As a result, stroke prevention is one of the main goals of AF treatment.

Stroke Prevention

The risk for stroke among patients with AF is evaluated using several factors. Two commonly used scores, the CHADS2 score and the CHA2DS2-VASc score are described in Table 1:

Table 1. $CHADS_2$ and $CHADS_2$-VASc Scores to Predict Ischemic Stroke Risk in Patients With Atrial Fibrillation

Letter	Clinical Characteristics	Points Awarded
C	Congestive heart failure (signs/symptoms of heart failure confirmed with objective evidence of cardiac dysfunction)	1
H	Hypertension (resting blood pressure >140/90 mmHg on at least 2 occasions or current antihypertensive pharmacologic treatment)	1
A	Age ≥75 y	2
D	Diabetes (fasting glucose >125 mg/dL or treatment with oral hypoglycemic agent and/or insulin)	1
S	Stroke or transient ischemic attack (includes any history of cerebral ischemia)	2
V	Vascular disease (prior myocardial infarction, peripheral arterial disease, or aortic plaque)	1
A	Age 65-74 y	1
Sc	Sex category of female (female sex confers higher risk)	1

Stroke in AF occurs primarily as a result of thromboemboli from the left atrium. The erratic atrial contractions in AF lead to blood stasis in the left atrium, and this low flow state increases the risk for thrombosis. The first-line treatment for stroke prevention in AF is long-term anticoagulation, which has proven efficacy. Warfarin, a vitamin K antagonist, is the predominant agent in clinical use. Several newer direct oral anticoagulant (DOAC) agents, including dabigatran, rivaroxaban apixaban, and edoxaban, have received U.S. Food and Drug Administration (FDA) approval for stroke prevention in nonvalvular AF and have demonstrated noninferiority to warfarin in clinical trials. Warfarin requires frequent monitoring and adjustments as well as lifestyle changes; DOACs do not require the frequent monitoring seen with warfarin therapy. While anticoagulation is effective for stroke prevention, it carries an increased risk of bleeding. Reversal agents can be used to counter the effects life-threatening bleeding in individuals using warfarin or DOAC therapy. Such agents carry their own risk of inducing life-threatening thrombosis. For individuals with AF who have a contraindication to warfarin and DOACs, dual antiplatelet therapy with aspirin and clopidogrel is an option for stroke prevention, though it is less protective than either warfarin or DOACs.

The area of the left atrium with the lowest blood flow in AF, and therefore the highest risk of thrombosis, is the left atrial appendage (LAA). The LAA is a small extension of the left atrium that can vary widely in both size and shape (morphology). LAA morphologies are described according to their appearance and include: the chicken wing, which is the most common morphology and features a prominent bend in the dominant lobe; the cactus, characterized by a dominant central lobe with superior and inferior secondary lobes; the windsock, which features one dominant lobe; and the cauliflower, which is the least common morphology and features numerous lobes with none being dominant. It has been estimated that over 90% of left atrial thrombi occur in the LAA. Surgical removal or exclusion of the LAA is often performed in patients with AF who are undergoing open heart surgery. Surgical techniques to exclude the LAA include resection or occlusion through stapling or clipping.

Regulatory Status

In June 2010, the AtriClip LAA Exclusion System (Atricure) was cleared for marketing by the U.S. Food and Drug Administration (FDA) through the 510(k) process (K093679). The FDA determined that this device was substantially equivalent to existing devices for occlusion of the LAA. The AtriClip has gone through numerous iterations since 2010, primarily relating to changes in the clip material composition and refinements of the clip applicator. The current FDA cleared indication is unchanged from the original 2010 indication, which states that the AtriClip is indicated for "exclusion of the LAA, performed under direct visualization, in conjunction with other cardiac surgical procedures." The FDA clearance documentation notes that direct

visualization "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." As of 2022, AtriCure markets 7 different versions of the AtriClip device, whose use varies according to LAA size and type of concomitant surgical procedure.

CODING

Medicare Advantage Plans and Commercial Products

The following CPT code(s) are not covered for Medicare Advantage Plans and not medically necessary for Commercial Products:

33267 Exclusion of left atrial appendage, open, any method (eg, excision, isolation via stapling, oversewing, ligation, plication, clip)

33269 Exclusion of left atrial appendage, thoracoscopic, any method (eg, excision, isolation via stapling, oversewing, ligation, plication, clip)

RELATED POLICIES

Percutaneous Left Atrial Appendage Closure Devices for Stroke Prevention in Atrial Fibrillation

PUBLISHED

Provider Update, November 2026
Provider Update, November 2025
Provider Update, October 2024
Provider Update, November 2023
Provider Update, October 2022

REFERENCES

1. Dewland TA, Olgin JE, Vittinghoff E, et al. Incident atrial fibrillation among Asians, Hispanics, blacks, and whites. Circulation. Dec 03 2013; 128(23): 2470-7. PMID 24103419
2. Mou L, Norby FL, Chen LY, et al. Lifetime Risk of Atrial Fibrillation by Race and Socioeconomic Status: ARIC Study (Atherosclerosis Risk in Communities). Circ Arrhythm Electrophysiol. Jul 2018; 11(7): e006350. PMID 30002066
3. Nesheiwat Z, Goyal A, Jagtap M. Atrial Fibrillation. In: StatPearls. Treasure Island (FL): StatPearls Publishing; November 28, 2021.
4. Gardener H, Sacco RL, Rundek T, et al. Race and Ethnic Disparities in Stroke Incidence in the Northern Manhattan Study. Stroke. Apr 2020; 51(4): 1064-1069. PMID 32078475
5. Guo J, Gabriel N, Magnani JW, et al. Racial and Urban-Rural Difference in the Frequency of Ischemic Stroke as Initial Manifestation of Atrial Fibrillation. Front Public Health. 2021; 9: 780185. PMID 34805085
6. Tamirisa KP, Al-Khatib SM, Mohanty S, et al. Racial and Ethnic Differences in the Management of Atrial Fibrillation. CJC Open. Dec 2021; 3(12 Suppl): S137-S148. PMID 34993443
7. Lip GYH, Banerjee A, Boriani G, et al. Antithrombotic Therapy for Atrial Fibrillation: CHEST Guideline and Expert Panel Report. Chest. Nov 2018; 154(5): 1121-1201. PMID 30144419
8. January CT, Wann LS, Alpert JS, et al. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. J Am Coll Cardiol. Dec 02 2014; 64(21): e1-76. PMID 24685669
9. Collado FMS, Lama von Buchwald CM, Anderson CK, et al. Left Atrial Appendage Occlusion for Stroke Prevention in Nonvalvular Atrial Fibrillation. J Am Heart Assoc. Nov 02 2021; 10(21): e022274. PMID 34668395
10. Rosati F, de Maat GE, Valente MAE, et al. Surgical clip closure of the left atrial appendage. J Cardiovasc Electrophysiol. Oct 2021; 32(10): 2865-2872. PMID 34288215
11. U.S. Food and Drug Administration. AtriClip LAA Exclusion System (K172742). https://www.accessdata.fda.gov/cdrh_docs/pdf17/K172742.pdf. Accessed June 29, 2026.

12. AtriCure. AtriClip LAA Exclusion System. https://www.atricure.com/healthcare-professionals/therapies/LAAM/atriclip-exclusion-system. Accessed June 29, 2026.
13. Ando M, Funamoto M, Cameron DE, et al. Concomitant surgical closure of left atrial appendage: A systematic review and meta-analysis. J Thorac Cardiovasc Surg. Sep 2018; 156(3): 1071-1080.e2. PMID 29628346
14. Atti V, Anantha-Narayanan M, Turagam MK, et al. Surgical left atrial appendage occlusion during cardiac surgery: A systematic review and meta-analysis. World J Cardiol. Nov 26 2018; 10(11): 242-249. PMID 30510641
15. Ibrahim AM, Tandan N, Koester C, et al. Meta-Analysis Evaluating Outcomes of Surgical Left Atrial Appendage Occlusion During Cardiac Surgery. Am J Cardiol. Oct 15 2019; 124(8): 1218-1225. PMID 31474327
16. Friedman DJ, Piccini JP, Wang T, et al. Association Between Left Atrial Appendage Occlusion and Readmission for Thromboembolism Among Patients With Atrial Fibrillation Undergoing Concomitant Cardiac Surgery. JAMA. Jan 23 2018; 319(4): 365-374. PMID 29362794
17. Aryana A, Singh SK, Singh SM, et al. Association between incomplete surgical ligation of left atrial appendage and stroke and systemic embolization. Heart Rhythm. Jul 2015; 12(7): 1431-7. PMID 25998141
18. Abrich VA, Narichania AD, Love WT, et al. Left atrial appendage exclusion during mitral valve surgery and stroke in atrial fibrillation. J Interv Card Electrophysiol. Dec 2018; 53(3): 285-292. PMID 30267182
19. Blackshear JL, Johnson WD, Odell JA, et al. Thoracoscopic extracardiac obliteration of the left atrial appendage for stroke risk reduction in atrial fibrillation. J Am Coll Cardiol. Oct 01 2003; 42(7): 1249-52. PMID 14522490
20. Fu M, Qin Z, Zheng S, et al. Thoracoscopic Left Atrial Appendage Occlusion for Stroke Prevention Compared with Long-Term Warfarin Therapy in Patients With Nonvalvular Atrial Fibrillation. Am J Cardiol. Jan 01 2019; 123(1): 50-56. PMID 30385030
21. Inoue T, Suematsu Y. Left atrial appendage resection can be performed minimally invasively with good clinical and echocardiographic outcomes without any severe risk. Eur J Cardiothorac Surg. Jul 01 2018; 54(1): 78-83. PMID 29370349
22. Jiang S, Zhang H, Wei S, et al. Left atrial appendage exclusion is effective in reducing postoperative stroke after mitral valve replacement. J Card Surg. Dec 2020; 35(12): 3395-3402. PMID 32939788
23. Kewcharoen J, Shah K, Bhardwaj R, et al. Surgical left atrial appendage occlusion in patients with left ventricular assist device. Pacing Clin Electrophysiol. Apr 2022; 45(4): 567-570. PMID 35199863
24. Ohtsuka T, Nonaka T, Hisagi M, et al. Thoracoscopic stapler-and-loop technique for left atrial appendage closure in nonvalvular atrial fibrillation: Mid-term outcomes in 201 patients. Heart Rhythm. Sep 2018; 15(9): 1314-1320. PMID 29803851
25. Park-Hansen J, Holme SJV, Irmukhamedov A, et al. 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. May 23 2018; 13(1): 53. PMID 29792215
26. Yao X, Gersh BJ, Holmes DR, et al. Association of Surgical Left Atrial Appendage Occlusion With Subsequent Stroke and Mortality Among Patients Undergoing Cardiac Surgery. JAMA. May 22 2018; 319(20): 2116-2126. PMID 29800182
27. Toale C, Fitzmaurice GJ, Eaton D, et al. Outcomes of left atrial appendage occlusion using the AtriClip device: a systematic review. Interact Cardiovasc Thorac Surg. Nov 01 2019; 29(5): 655-662. PMID 31292605
28. Kurfirst V, Mokrácek A, Canádyová J, et al. Epicardial clip occlusion of the left atrial appendage during cardiac surgery provides optimal surgical results and long-term stability. Interact Cardiovasc Thorac Surg. Jul 01 2017; 25(1): 37-40. PMID 28369643
29. Whitlock RP, Belley-Cote EP, Paparella D, et al. Left Atrial Appendage Occlusion during Cardiac Surgery to Prevent Stroke. N Engl J Med. Jun 03 2021; 384(22): 2081-2091. PMID 33999547
30. Gerdisch MW, Garrett HE, Mumtaz MA, et al. Prophylactic Left Atrial Appendage Exclusion in Cardiac Surgery Patients With Elevated CHA 2 DS 2 -VASc Score: Results of the Randomized ATLAS Trial. Innovations (Phila). 2022; 17(6): 463-470. PMID 36373654

31. Soltesz EG, Dewan KC, Anderson LH, et al. Improved outcomes in CABG patients with atrial fibrillation associated with surgical left atrial appendage exclusion. J Card Surg. Apr 2021; 36(4): 1201-1208. PMID 33491275
32. Caliskan E, Sahin A, Yilmaz M, et al. Epicardial left atrial appendage AtriClip occlusion reduces the incidence of stroke in patients with atrial fibrillation undergoing cardiac surgery. Europace. Jul 01 2018; 20(7): e105-e114. PMID 29016813
33. Kurfirst V, Mokracek A, Canadyova J, et al. Effectivity of Left Atrial Appendage Occlusion with AtriClip in 155 Consecutive Patients - Single Center Study. Cor et Vasa. August 2017; 59(4): e376-e380.
34. van der Heijden CAJ, Weberndörfer V, Luermans JGLM, et al. Hybrid ablation of atrial fibrillation: A unilateral left-sided thoracoscopic approach. J Card Surg. Dec 2022; 37(12): 4630-4638. PMID 36349741
35. Petersen J, Böning H, Yildirim S, et al. Efficacy of four different left atrial appendage closure techniques during cardiac surgery-A transesophageal echocardiography follow-up study. JTCVS Tech. Aug 2024; 26: 43-49. PMID 39156535
36. Zias E, Phillips KG, Gerdisch M, et al. Long-Term Follow-Up of Left Atrial Appendage Exclusion: Results of the V-CLIP Multi-Center Post-Market Study. J Clin Med. Aug 04 2025; 14(15). PMID 40807093
37. Wańha W, Kuźma Ł, Kowalewski M, et al. Primary Results of the SALAMANDER Registry: A Multicenter Observational Cohort Study. J Am Heart Assoc. May 19 2026; 15(10): e046625. PMID 42132197
38. Branzoli S, Guarracini F, Marini M, et al. Heart Team for Left Atrial Appendage Occlusion: A Patient-Tailored Approach. J Clin Med. Dec 29 2021; 11(1). PMID 35011916
39. Cartledge R, Suwalski G, Witkowska A, et al. Standalone epicardial left atrial appendage exclusion for thromboembolism prevention in atrial fibrillation. Interact Cardiovasc Thorac Surg. Mar 31 2022; 34(4): 548-555. PMID 34871377
40. Franciulli M, De Martino G, Librera M, et al. Stand-Alone Thoracoscopic Left Atrial Appendage Closure in Nonvalvular Atrial Fibrillation Patients at High Bleeding Risk. Innovations (Phila). 2020; 15(6): 541-546. PMID 33048625
41. Wang E, Sadleir P, Sourinathan V, et al. Thoracoscopic Left Atrial Appendage Occlusion with the AtriClip PRO2: An Experience of 144 Patients. Heart Lung Circ. Aug 2024; 33(8): 1215-1220. PMID 38604885
42. Joglar JA, Chung MK, Armbruster AL, et al. 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Circulation. Jan 02 2024; 149(1): e1-e156. PMID 38033089
43. Tzeis S, Gerstenfeld EP, Kalman J, et al. 2024 European Heart Rhythm Association/Heart Rhythm Society/Asia Pacific Heart Rhythm Society/Latin American Heart Rhythm Society expert consensus statement on catheter and surgical ablation of atrial fibrillation. Heart Rhythm. Sep 2024; 21(9): e31-e149. PMID 38597857
44. Saw J, Holmes DR, Cavalcante JL, et al. SCAI/HRS expert consensus statement on transcatheter left atrial appendage closure. Heart Rhythm. May 2023; 20(5): e1-e16. PMID 36990925
45. Wyler von Ballmoos MC, Hui DS, Mehaffey JH, et al. The Society of Thoracic Surgeons 2023 Clinical Practice Guidelines for the Surgical Treatment of Atrial Fibrillation. Ann Thorac Surg. Aug 2024; 118(2): 291-310. PMID 38286206

CLICK THE ENVELOPE ICON BELOW TO SUBMIT COMMENTS

This medical policy is made available to you for informational purposes only. It is not a guarantee of payment or a substitute for your medical judgment in the treatment of your patients. Benefits and eligibility are determined by the member's subscriber agreement or member certificate and/or the employer agreement, and those documents will supersede the provisions of this medical policy. For information on member-specific benefits, call the provider call center. If you provide services to a member which are determined to not be medically necessary (or in some cases medically necessary services which are non-covered benefits), you may not charge the member for the services unless you have informed the member and they have agreed in writing in advance to continue with the treatment at their own expense. Please refer to your participation agreement(s) for the applicable provisions. This policy is current at the time of publication; however, medical practices, technology, and knowledge are constantly changing. BCBSRI reserves the right to review and revise this policy for any reason and at any time, with or without notice. Blue Cross & Blue Shield of Rhode Island is an independent licensee of the Blue Cross and Blue Shield Association.