Surgical Left Atrial Appendage Occlusion Devices for Stroke Prevention in Atrial Fibrillation

Policy # 00806
Original Effective Date: 05/01/2023
Current Effective Date: 05/01/2023

Applies to all products administered or underwritten by Blue Cross and Blue Shield of Louisiana and its subsidiary, HMO Louisiana, Inc.(collectively referred to as the "Company"), unless otherwise provided in the applicable contract. Medical technology is constantly evolving, and we reserve the right to review and update Medical Policy periodically.

Note: Percutaneous Left-Atrial Appendage Closure Devices for Stroke Prevention in Atrial Fibrillation is addressed separately in medical policy 00296.

Services Are Considered Investigational

Coverage is not available for investigational medical treatments or procedures, drugs, devices or biological products.

Based on review of available data, the Company considers 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 to be **investigational.***

Based on review of available data, the Company considers 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 to be **investigational.***

Background/Overview

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 (e.g., 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 $CHADS_2$ score and the CHA_2DS_2-VASc score are described in Table 1:

Table 1. $CHADS_2$ and CHA_2DS_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	1 ($CHADS_2$) 2 (CHA_2DS_2-VASc)
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

Adapted from Lip et al (2018) and January et al (2014)

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.

FDA or Other Governmental Regulatory Approval

U.S. Food and Drug Administration (FDA)

In June 2010, the AtriClip LAA Exclusion System (Atricure) was cleared for marketing by the U.S. 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.

Rationale/Source

This medical policy was developed through consideration of peer-reviewed medical literature generally recognized by the relevant medical community, U.S. Food and Drug Administration approval status, nationally accepted standards of medical practice and accepted standards of medical practice in this community, technology evaluation centers, reference to federal regulations, other plan medical policies, and accredited national guidelines.

Atrial fibrillation 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. FDA for surgical LAA occlusion for stroke prevention in patients with AF.

Summary of Evidence

For individuals with AF at increased risk for embolic stroke undergoing LAA occlusion with an AtriClip device concomitant with open or thoracoscopic cardiac surgical procedures, the evidence includes a randomized controlled trial (RCT), a controlled observational study, and case series. Relevant outcomes are ischemic stroke, cardiac events, and mortality. Although evidence from several systematic reviews and a large (N>10,000) observational study found surgical LAA occlusion associated with a reduction in the risk of stroke without an increase in the risk of adverse

events, direct evidence specifically comparing the AtriClip Left Atrial Appendage Exclusion System with anticoagulation, another surgical occlusion method, or no occlusion is limited. LAA occlusion was associated with a reduced risk of stroke versus no occlusion in the Left Atrial Appendage Occlusion Study (LAAOS) III trial, but the trial was not designed to specifically assess the net health benefit of LAA occlusion with an AtriClip device. A retrospective database study that compared the AtriClip device with no occlusion found that AtriClip placement was associated with a lower risk of ischemic stroke, which was not statistically significant, and a reduced risk of thromboembolism that was of marginal statistical significance. Large (N>100) case series of AtriClip device use with 2- to 3- years follow-up reported stroke rates ≤1% in the postoperative period and ≤2% in the long-term follow-up. Well-designed RCTs with follow-up of 1 year or more comparing the AtriClip device with anticoagulation, other surgical occlusion methods, and/or no occlusion are needed to provide adequate evidence for assessment of net health benefit. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

For individuals with AF at increased risk for embolic stroke undergoing LAA occlusion with an AtriClip device as a stand-alone procedure, the evidence includes a controlled observational study and case series. Relevant outcomes are ischemic stroke, cardiac events, and mortality. One small (N=40) industry sponsored retrospective observational study reported that use of the AtriClip device as a stand-alone procedure resulted in similar outcomes compared to percutaneous LAA occlusion. This evidence is too limited to draw definitive conclusions. Well-designed RCTs with follow-up of 1 year or more comparing stand-alone AtriClip device placement with percutaneous LAA occlusion are needed to provide adequate evidence for assessment of net health benefit. The evidence is insufficient to determine that the technology results in an improvement in the net health outcome.

Supplemental Information

The purpose of the following information is to provide reference material. Inclusion does not imply endorsement or alignment with the evidence review conclusions.

Practice Guidelines and Position Statements

Guidelines or position statements will be considered for inclusion in ‘Supplemental Information' if they were issued by, or jointly by, a US professional society, an international society with US representation, or National Institute for Health and Care Excellence (NICE). Priority will be given

to guidelines that are informed by a systematic review, include strength of evidence ratings, and include a description of management of conflict of interest.

American Heart Association et al
In 2019, the American Heart Association, in conjunction with the American College of Cardiology and the Heart Rhythm Society, issued a focused update of their 2014 joint guideline on the management of individuals with AF. The focused update states that "surgical occlusion of the LAA may be considered in patients with AF undergoing cardiac surgery as a component of an overall heart team approach to the management of AF" (Class IIB [weak evidence of benefit outweighing risk]; Level B-NR [moderate-quality evidence from nonrandomized studies or meta-analyses of those studies]). No recommendation was made regarding the method of surgical LAA occlusion.

American College of Chest Physicians
Guidance from the American College of Chest Physicians in 2018 recommends:

- In patients with AF at high risk of ischemic stroke who have absolute contraindications for oral anticoagulants (OAC), we suggest using LAA occlusion (weak recommendation, low quality evidence).
- In AF patients at risk of ischemic stroke undergoing cardiac surgery, we suggest considering surgical exclusion of the LAA for stroke prevention, but the need for long-term OAC is unchanged (weak recommendation, low quality evidence).

Neither statement recommends a specific occlusion method or approach.

U.S. Preventive Services Task Force Recommendations
No U.S. Preventive Services Task Force (USPSTF) recommendations for surgical LAA occlusion have been identified.

Medicare National Coverage
There is no national coverage determination. In the absence of a national coverage determination, coverage decisions are left to the discretion of local Medicare carriers.

Ongoing and Unpublished Clinical Trials
Some currently unpublished trials that might influence this review are listed in Table 2.

Table 2. Summary of Key Trials

NCT No.	Trial Name	Planned Enrollment	Completion Date
Ongoing			
NCT05144958	Stand-Alone Left Atrial Appendage Occlusion for thromboembolism Prevention in Nonvalvular Atrial fibrillation Disease Registry (SALAMANDER)	400	Mar 2025
NCT03838341	Stand-Alone Thoracoscopic Epicardial Left Atrial Appendage Occlusion With AtriClip®‡ Device for Thromboembolism Prevention in Nonvalvular Atrial Fibrillation - the Polish Nationwide Registry.	100	Jan 2025
Unpublished			
NCT02701062[a]	AtriClip®‡ Left Atrial Appendage Exclusion Concomitant to Structural Heart Procedures (ATLAS)	562	Jun 2019

NCT: national clinical trial.
[a] Denotes industry-sponsored or cosponsored trial.

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02/02/2023 Medical Policy Committee review
02/08/2023 Medical Policy Implementation Committee approval. New policy.

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Codes used to identify services associated with this policy may include (but may not be limited to) the following:

Code Type	Code
CPT	33267, 33268, 33269
HCPCS	NA
ICD-10 Diagnosis	I48.0-I48.92

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A. Whether the medical treatment, procedure, drug, device, or biological product can be lawfully marketed without approval of the U.S. Food and Drug Administration (FDA) and whether such approval has been granted at the time the medical treatment, procedure, drug, device, or biological product is sought to be furnished; or
B. Whether the medical treatment, procedure, drug, device, or biological product requires further studies or clinical trials to determine its maximum tolerated dose, toxicity, safety, effectiveness, or effectiveness as compared with the standard means of treatment or diagnosis, must improve health outcomes, according to the consensus of opinion among experts as shown by reliable evidence, including:
    1. Consultation with technology evaluation center(s);
    2. Credible scientific evidence published in peer-reviewed medical literature generally recognized by the relevant medical community; or
    3. Reference to federal regulations.

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