Medical Policy

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

**Table of Contents**
- Policy: Commercial
- Policy: Medicare
- Authorization Information
- Coding Information
- Description
- Policy History
- Information Pertaining to All Policies
- References

**Policy Number: 334**
BCBSA Reference Number: 2.02.26
NCD/LCD: National Coverage Determination (NCD) for Percutaneous Left Atrial Appendage Closure (LAAC) (20.34)

**Related Policies**
- Catheter Ablation as a Treatment for Atrial Fibrillation, #141
- Open and Thoracoscopic Approaches to Treat Atrial Fibrillation and Atrial Flutter (Maze and Related Procedures), #356

**Policy**

**Commercial Members: Managed Care (HMO and POS), PPO, and Indemnity**

The use of a device with U.S. Food and Drug Administration (FDA) approval for percutaneous left atrial appendage closure (eg, the Watchman) may be considered **MEDICALLY NECESSARY** for the prevention of stroke in patients with non-valvular atrial fibrillation when the following criteria are met:

- There is an increased risk of stroke and systemic embolism based on CHADS₂ or CHA₂DS₂-VASc score and systemic anticoagulation therapy is recommended; **AND**
- The long-term risks of systemic anticoagulation outweigh the risks of the device implantation.

The balance of risks and benefits associated with implantation of the Watchman device for stroke prevention, as an alternative to systemic anticoagulation with warfarin, must be made on an individual basis.

Bleeding is the primary risk associated with systemic anticoagulation. A number of risk scores have been developed to estimate the risk of significant bleeding in patients treated with systemic anticoagulation. An example is the HAS-BLED score, which has validated to assess the annual risk of significant bleeding in patients with AF treated with warfarin (Pisters et al, 2010). The score ranges from 0 to 9, based on a number of clinical characteristics (see Table PG1).

**Table PG1: Clinical Components of the HAS-BLED Bleeding Risk Score**
<table>
<thead>
<tr>
<th>Letter</th>
<th>Clinical Characteristic</th>
<th>Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>Hypertension</td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td>Abnormal renal and liver function (1 point each)</td>
<td>1 or 2</td>
</tr>
<tr>
<td>S</td>
<td>Stroke</td>
<td>1</td>
</tr>
<tr>
<td>B</td>
<td>Bleeding</td>
<td>1</td>
</tr>
<tr>
<td>L</td>
<td>Labile international normalized ratios</td>
<td>1</td>
</tr>
<tr>
<td>E</td>
<td>Elderly (&gt;65 y)</td>
<td>1</td>
</tr>
<tr>
<td>D</td>
<td>Drugs or alcohol (1 point each)</td>
<td>1 or 2</td>
</tr>
</tbody>
</table>

Adapted from Pisters et al (2010).

Risk of major bleeding in patients with scores of 3, 4, and 5 has been reported at 3.74 per 100 patient-years, 8.70 per 100 patient-years, and 12.5 per 100 patient-years, respectively. Scores of 3 or greater are considered to be associated with high risk of bleeding, potentially signaling the need for closer monitoring of patients for adverse risks, closer monitoring of international normalized ratio, or differential dose selections of oral anticoagulants or aspirin (January et al, 2014).

The use of a device with FDA approval for percutaneous left atrial appendage closure (eg, the Watchman) for stroke prevention in patients who do not meet the above criteria is considered INVESTIGATIONAL.

The use of other percutaneous left atrial appendage closure devices, including but not limited to the Lariat, and Amplatzer devices, for stroke prevention in patients with atrial fibrillation is considered INVESTIGATIONAL.

**Medicare HMO BlueSM and Medicare PPO BlueSM Members**

Medical necessity criteria and coding guidance can be found through the link(s) below.

**National Coverage Determinations (NCDs)**

National Coverage Determination (NCD) for Percutaneous Left Atrial Appendage Closure (LAAC) (20.34)

**Note:** To review the specific NCD, please remember to click “accept” on the CMS licensing agreement at the bottom of the CMS webpage.

**Prior Authorization Information**

**Inpatient**
- For services described in this policy, precertification/preauthorization **IS REQUIRED** for all products if the procedure is performed **inpatient**.

**Outpatient**
- For services described in this policy, see below for products where prior authorization **might be required** if the procedure is performed **outpatient**.

<table>
<thead>
<tr>
<th>Commercial Managed Care (HMO and POS)</th>
<th>Prior authorization is <strong>not required</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial PPO and Indemnity</td>
<td>Prior authorization is <strong>not required</strong>.</td>
</tr>
<tr>
<td>Medicare HMO BlueSM</td>
<td>Prior authorization is <strong>not required</strong>.</td>
</tr>
<tr>
<td>Medicare PPO BlueSM</td>
<td>Prior authorization is <strong>not required</strong>.</td>
</tr>
</tbody>
</table>

**CPT Codes / HCPCS Codes / ICD Codes**

Inclusion or exclusion of a code does not constitute or imply member coverage or provider reimbursement. Please refer to the member’s contract benefits in effect at the time of service to determine coverage or non-coverage as it applies to an individual member.
Providers should report all services using the most up-to-date industry-standard procedure, revenue, and diagnosis codes, including modifiers where applicable.

The following codes are included below for informational purposes only; this is not an all-inclusive list.

The above medical necessity criteria MUST be met for the following codes to be covered for Commercial Members: Managed Care (HMO and POS), PPO, Indemnity, Medicare HMO Blue and Medicare PPO Blue:

CPT Codes

<table>
<thead>
<tr>
<th>CPT codes:</th>
<th>Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>33340</td>
<td>Percutaneous transcatheter closure of the left atrial appendage with endocardial implant, including fluoroscopy, transseptal puncture, catheter placement(s), left atrial angiography, left atrial appendage angiography, when performed, and radiological supervision and interpretation</td>
</tr>
</tbody>
</table>

Description

Atrial Fibrillation and Stroke

AF is the most common type of irregular heartbeat, affecting at least 2.7 million people in the U.S. Stroke is the most serious complication of AF. The estimated incidence of stroke in nontreated patients with AF is 5% per year. 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 a main goal of AF treatment.

Stroke in AF occurs primarily as a result of thromboembolism from the left atrium. The lack of atrial contractions in AF leads to blood stasis in the left atrium, and this low flow state increases the risk for thrombosis. 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). It has been estimated that 90% of left atrial thrombi occur in the LAA.

Treatment

Pharmacologic

The main treatment for stroke prevention in AF is anticoagulation, which has proven efficacy. The risk for stroke among patients with AF is evaluated using several factors. Two commonly used scores, the CHADS2 score and the CHADS2-VASc score are described below in Table 1. Warfarin is the predominant agent in clinical use. A number of newer anticoagulant medications, including dabigatran, rivaroxaban, and apixaban, 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. While anticoagulation is effective for stroke prevention, it carries an increased risk of bleeding. Also, warfarin requires frequent monitoring and adjustments as well as lifestyle changes. Dabigatran does not require monitoring. However, unlike warfarin, the antithrombotic effects of dabigatran are not reversible with any currently available hemostatic drugs. Guidelines from the American College of Chest Physicians (2012) have recommended the use of oral anticoagulation for patients with AF who are at high-risk of stroke (ie, CHADS2 score ≥2), with more individualized choice of antithrombotic therapy in patients with lower stroke risk.1

Table 1. CHADS2 and CHADS2-VASc Scores to Predict Ischemic Stroke Risk in Patients With Atrial Fibrillation

<table>
<thead>
<tr>
<th>Letter</th>
<th>Clinical Characteristics</th>
<th>Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Congestive heart failure (signs/symptoms of heart failure confirmed with objective evidence of cardiac dysfunction)</td>
<td>1</td>
</tr>
</tbody>
</table>
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

Adapted from You et al (2012) and January et al (2014).

Bleeding is the primary risk associated with systemic anticoagulation. Risk scores have been developed to estimate the risk of significant bleeding in patients treated with systemic anticoagulation, such as the HAS-BLED score, which has been validated to assess the annual risk of significant bleeding in patients with AF treated with warfarin. The score ranges from 0 to 9, based on clinical characteristics, including the presence of hypertension, renal and liver function, history of stroke, bleeding, labile international normalized ratios, age, and drug/alcohol use. Scores of three or greater are considered to be associated with high-risk of bleeding, potentially signaling the need for closer monitoring of patients for adverse risks, closer monitoring of international normalized ratios, or differential dose selections of oral anticoagulants or aspirin.

Surgery
Surgical removal, or exclusion, of the LAA is often performed in patients with AF who are undergoing open heart surgery for other reasons. Percutaneous left atrial appendage closure (LAAC) devices have been developed as a nonpharmacologic alternative to anticoagulation for stroke prevention in AF. The devices may prevent stroke by occluding the LAA, thus preventing thrombus formation.

Several versions of LAA occlusion devices have been developed. The PLAATO system (ev3 Endovascular) was the first device to be approved by the FDA for LAA occlusion. The device was discontinued in 2007 for commercial reasons, and intellectual property was sold to manufacturers of the Watchman system. The Watchman Left Atrial Appendage System (Boston Scientific) is a self-expanding nickel titanium device. It has a polyester covering and fixation barbs for attachment to the endocardium. Implantation is performed percutaneously through a catheter delivery system, using venous access and transseptal puncture to enter the left atrium. Transesophageal echocardiography and fluoroscopy are used to guide the procedure. Following implantation, patients receive anticoagulation with warfarin or alternative agents for approximately one to two months. After this period, patients are maintained on antiplatelet agents (ie, aspirin and/or clopidogrel) indefinitely. The Amplatzer cardiac plug (St. Jude Medical), is FDA-approved for closure of atrial septal defects but not for LAAC. A second-generation device, the Amplatzer Amulet, has been developed for the specific indication of LAAC, but currently does not have the FDA approval. The Amplatzer Amulet consists of a nitinol mesh disc to seal the ostium of the LAA and a nitinol mesh distal lobe, to be positioned within the LAA. The device is preloaded within a delivery sheath. The Percutaneous LAA Transcatheter Occlusion device (ev3) has also been evaluated in research studies but has not received the FDA approval. The Occlutech® (Occlutech) Left Atrial Appendage Occluder has received a CE mark for coverage in Europe. The Cardioblate® closure device (Medtronic) is currently being tested in clinical studies.

The Lariat Loop Applicator is a suture delivery device approved by the FDA, intended to close a variety of surgical wounds. It is not specifically approved for LAAC. While the Watchman and other devices are implanted in the endocardium, the Lariat is a non-implant epicardial device.

Outcome Measures
The optimal study design for evaluating the efficacy of percutaneous LAAC for the prevention of stroke in AF is a randomized controlled trial that includes clinically relevant measures of health outcomes. The rate of ischemic stroke during follow-up is the primary outcome of interest, along with rates of systemic
embolization, cardiac events, bleeding complications, and death. For the LAAC devices, the appropriate comparison group could be oral anticoagulation, no therapy (for patients who have a prohibitive risk for oral anticoagulation), or open surgical repair.

Although the Watchman device and other LAAC devices would ideally represent an alternative to oral anticoagulation for the prevention of stroke in patients with AF, during the postimplantation period, the device may be associated with increased thrombogenicity and, therefore, anticoagulation is used during the periprocedural period. Most studies evaluating the Watchman device have included patients who are eligible for anticoagulation.

**Summary**

Stroke prevention in patients with atrial fibrillation (AF) is an important goal of treatment. Treatment with anticoagulant medications is the most common approach to stroke prevention. Because most embolic strokes originate from the left atrial appendage, occlusion of the left atrial appendage may offer a nonpharmacologic alternative to anticoagulant medications to lower the risk of stroke. Multiple percutaneously deployed devices are being investigated for left atrial appendage closure (LAAC). One left atrial appendage device (the Watchman device) has approval from the U.S. Food and Drug Administration for stroke prevention in patients with AF.

For individuals who have AF who are at increased risk for embolic stroke who receive the Watchman percutaneous LAAC device, the evidence includes two randomized controlled trials and meta-analyses of these trials. The relevant outcomes are overall survival, morbid events, and treatment-related morbidity. The most relevant evidence comes from two industry-sponsored randomized controlled trials that compared the Watchman device with anticoagulation alone. One trial reported noninferiority on a composite outcome of stroke, cardiovascular/unexplained death, or systemic embolism after two years of follow-up, with continued benefits with the Watchman device after four years of follow-up. The second trial did not demonstrate noninferiority for the same composite outcome but did demonstrate noninferiority of the Watchman device to warfarin for late ischemic stroke and systemic embolization. Patient-level meta-analyses at five-year follow-up for the two trials reported that the Watchman device is noninferior to warfarin on the composite outcome of stroke, systemic embolism, and cardiovascular death. Also, the Watchman was associated with lower rates in major bleeding, particularly hemorrhagic stroke, and mortality over the long-term. The evidence also indicates that the Watchman device is efficacious in preventing stroke in the subset of patients with AF who are at increased risk for embolic stroke. Among patients in which the long-term risk of systemic anticoagulation exceeds the procedural risk of device implantation, the net health outcome will be improved. The evidence is sufficient to determine that the technology results in a meaningful improvement in the net health outcome.

For individuals who have AF who are at increased risk for embolic stroke who receive a percutaneous LAAC device other than the Watchman device (eg, the Lariat or Amplatzer), the evidence includes several nonrandomized comparator studies and uncontrolled case series. The relevant outcomes are overall survival, morbid events, and treatment-related morbidity. One nonrandomized study which compared outcomes among patients undergoing LAAC with the Lariat device with patients receiving anticoagulant or antiplatelet therapy, reported fewer thromboembolic events in the group receiving the Lariat device. Two nonrandomized studies compared the Amplatzer cardiac plug with the Amplatzer amulet. While the amulet may be technically easier to implant, clinical outcomes were similar between the two groups. The remaining evidence consists of case series of these devices which report high procedural success but also numerous complications. In addition, these devices do not have Food and Drug Administration approval for LAAC. The evidence is insufficient to determine the effects of the technology on health outcomes.

**Policy History**

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/2020</td>
<td>Medically necessary policy statement clarified to include non-valvular terminology.</td>
</tr>
</tbody>
</table>
Information Pertaining to All Blue Cross Blue Shield Medical Policies
Click on any of the following terms to access the relevant information:
Medical Policy Terms of Use
Managed Care Guidelines
Indemnity/PPO Guidelines
Clinical Exception Process
Medical Technology Assessment Guidelines

References


17. Baman, JJ, Mansour, MM, Heist, EE, Huang, DD, Biton, YY. Percutaneous left atrial appendage occlusion in the prevention of stroke in atrial fibrillation: a systematic review. Heart Fail Rev, 2018 Feb 18;23(2). PMID 29453694


45. Litwinowicz, RR, Bartus, MM, Buryasz, MM, BrzeziÅœski, MM, Suwalski, PP, Kapelak, BB, Vuddanda, 
V, Lakhiiredy, DD, Lee, RR, Trabka, RR, Bartus, KK. Long term outcomes after left atrial 
appendage occlusion with the LARIAT device—Stroke risk reduction over five years follow-up. PLoS 
ONE, 2018 Dec 20;13(12). PMID 30566961

46. Litwinowicz, RR, Bartus, MM, Kapelak, BB, Suwalski, PP, Lakhiiredy, DD, Lee, RR, Bartus, KK. 
Reduction in risk of stroke and bleeding after left atrial appendage closure with LARIAT device in 
patients with increased risk of stroke and bleeding: Long term results. Catheter Cardiovasc Interv, 
2019 Mar 19. PMID 30884101


prevention in atrial fibrillation with Amplatzer cardiac plug: the Belgian Registry. Acta Cardiol. Dec 
2013;68(6):551-558. PMID 24579432

49. Guerios EE, Schmid M, Gloekler S, et al. Left atrial appendage closure with the Amplatzer cardiac 

reduce the stroke risk in nonvalvular atrial fibrillation patients? A single-center case series. Pacing 

results in 35 consecutive patients after closure of left atrial appendage with the Amplatzer Cardiac 

52. Streb W, Szymala M, Kukulski T, et al. Percutaneous closure of the left atrial appendage using the 
Amplatzer Cardiac Plug in patients with atrial fibrillation: evaluation of safety and feasibility. Kardiol 

non-valvular atrial fibrillation: implantation and up to four years follow-up of the AMPLATZER Cardiac 

54. Meerkin D, Butnaru A, Dratva D, et al. Early safety of the Amplatzer Cardiac Plug for left atrial 

55. Wiebe J, Bertog S, Franke J, et al. Safety of percutaneous left atrial appendage closure with the 
Amplatzer cardiac plug in patients with atrial fibrillation and contraindications to anticoagulation. 
Catheter Cardiovasc Interv. Apr 1 2014;83(5):796-802. PMID 24327462

56. Urena M, Rodes-Cabau J, Freixa X, et al. Percutaneous left atrial appendage closure with the 
AMPLATZER cardiac plug device in patients with nonvalvular atrial fibrillation and contraindications to 

2015;104(8):656-665. PMID 25736061

58. Landmesser, UU, Schmidt, BB, Nielsen-Kudsk, JJ, Lam, SS, Park, JJ, Tarrantini, GG, Cruz-Gonzalez, 
Il, Geist, VV, Della Bella, PP, Colombo, AA, Zeus, TT, Omran, HH, Piorkowski, CC, Lund, JJ, Tondo, 
CC, Hildick-Smith, DD. Left atrial appendage occlusion with the AMPLATZER Amulet device: 
periprocedural and early clinical/echocardiographic data from a global prospective observational 
study. EuroIntervention, 2017 Jun 27;13(7). PMID 28649053

59. Landmesser, UU, Tondo, CC, Camm, JJ, Diener, HH, Paul, VV, Schmidt, BB, Settergren, MM, 
Teiger, EE, Nielsen-Kudsk, JJ, Hildick-Smith, DD. Left atrial appendage occlusion with the 
AMPLATZER Amulet device: one-year follow-up from the prospective global Amulet observational 
registry. EuroIntervention, 2018 May 29;14(5). PMID 29806820

60. Al-Kassou, BB, Omran, HH. Comparison of the Feasibility and Safety of First- versus Second- 
1;2017:1519362. PMID 29085833

Cleveland, JJ, Murray, KK, Elinor, PP, Shea, JJ, Ezekowitz, MM, Tracy, CC, Yancy, CC. 2019 
AHA/ACC/HRS Focused Update of the 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 Clinical Practice Guidelines and the Heart Rhythm Society. Heart Rhythm, 
2019 Feb 1. PMID 30703530