I. POLICY

Catheter ablation may be considered medically necessary for the treatment of supraventricular tachyarrhythmias, as follows:

- Treatment of paroxysmal supraventricular tachycardia due to AV nodal re-entry tachycardia
- Treatment of paroxysmal supraventricular tachycardia due to accessory pathways
- Treatment of atrial flutter
- Treatment of focal atrial tachycardia

Catheter ablation using radiofrequency energy may be considered medically necessary for the treatment of chronic, recurrent, ventricular tachycardia that is refractory to implantable cardioverter-defibrillator treatment and antiarrhythmic medications, and for which an identifiable arrhythmogenic focus can be identified.

Catheter ablation for ventricular tachycardia “storm” may be considered medically necessary when pharmacologic treatment has been unsuccessful in controlling the arrhythmia. Ventricular tachycardia “storm” (VT), also known as incessant ventricular tachycardia, is defined as at least three episodes of sustained VT in a 24-hour period. This is considered a life-threatening situation that requires prompt attention and treatment.

Catheter ablation for all other ventricular arrhythmias is considered investigational. There is insufficient evidence to support a conclusion concerning the health outcomes or benefits associated with this procedure.

Policy Guidelines

Catheter ablation may be considered first-line therapy for treatment of the supraventricular tachyarrhythmias noted above; that is, patients do not need to have failed medical therapy to be considered for catheter ablation.

Permanent pacemaker implantation might be necessary following catheter ablation for supraventricular arrhythmias.

Cross-reference

MP-2.082 Catheter Ablation of the Pulmonary Veins as a Treatment of Atrial Fibrillation
MP-2.083 Open and Thoracoscopic Approaches to Treat Atrial Fibrillation (MAZE and Related Procedures)
MP-1.081 Cardioverter-Defibrillators (Implantable and External)
II. PRODUCT VARIATIONS

[N] = No product variation, policy applies as stated
[Y] = Standard product coverage varies from application of this policy, see below

[N] CHIP
[N] PPO
[N] HMO
[N] SeniorBlue HMO
[N] SeniorBlue PPO

[N] Indemnity
[N] SpecialCare
[N] POS
[Y] FEP PPO*

* Refer to FEP Medical Policy Manual MP-2.02.01 Catheter Ablation for Cardiac Arrhythmias. The FEP Medical Policy manual can be found at: www.fepblue.org

III. DESCRIPTION/BACKGROUND

Catheter ablation is a technique for eliminating cardiac arrhythmias by selectively destroying a portion of myocardium, or conduction system tissue that contains the arrhythmogenic focus. Radiofrequency energy is the most commonly used source for ablation of cardiac arrhythmias, although other energy sources such as cryoablation have also been used. The technique treats supraventricular tachycardias by partially or fully ablating the atrioventricular (AV) node or accessory conduction pathways, thus ablating the arrhythmogenic focus. It controls idiopathic ventricular or re-entrant ventricular tachycardias by eliminating the focus.

Ablation is preceded by preprocedural imaging and mapping of the focus during electrophysiologic studies. Imaging and anatomic mapping systems recreate the three-dimensional structure of the cardiac chambers. This assists the electrophysiologist in defining the individual anatomy, locating the electroanatomic location of arrhythmogenic foci and positioning the ablation catheter for delivery of radiofrequency energy. There are a variety of approaches to preprocedural imaging and mapping. Most commonly computed tomographic angiography (CTA) and/or magnetic resonance imaging (MRI) are used for initial imaging. Mapping can be done by an electroanatomic technique, by using multielectrode arrays, or by variations of these approaches.

Anticoagulation is indicated for some patients undergoing ablation. In general, ablations involving the right side of the heart for supraventricular arrhythmias do not require anticoagulation. Ablations in the left side of the heart are often combined with anticoagulation during and/or after the procedure. There are no standardized guidelines for which patients should receive anticoagulation or for the duration of therapy.

Catheter ablation is invasive in that a catheter is passed into the heart via an arm or leg vein. The risks of catheter ablation vary with the specific type of procedure performed and
whether or not there are underlying structural abnormalities of the heart. A variety of complications have been documented; these include:

- Vascular injury. Injury can occur to the peripheral vessels at the site of vascular access, with resulting hemorrhage, AV fistula, and/or pseudoaneurysm formation. Venous injury may lead to deep venous thrombosis, with the attendant risk of pulmonary embolism. Significant vascular injury has been estimated to occur in approximately 2% of ablation procedures.

- Cardiac tamponade. Perforation of the myocardium can lead to bleeding into the pericardial space and cardiac tamponade. This complication is estimated to occur in approximately 1% of ablation procedures and may require pericardiocentesis for treatment.

- Myocardial ischemia/infarction. Ischemia or infarction can result from damage to the coronary arteries during the procedure or from demand ischemia as a result of the procedure. The rate of these complications is not well characterized.

- Thromboembolism. Destruction of tissue by radiofrequency energy promotes thrombus formation. Thromboembolism following ablation most commonly leads to stroke or transient ischemic attack (TIA). The estimated incidence of stroke or TIA following catheter ablation is 1.3%.

- Heart failure. Heart failure can be precipitated by “stunning” of myocardium following ablation, and/or by the saline administration required during the procedure. Patients who are at risk for this complication are mostly those with pre-existing left-ventricular dysfunction. Patients undergoing large ablations of the left ventricle are at greatest risk.

- Radiation exposure. In any ablation procedure using radiofrequency energy, the patient (and possibly the treating clinicians) is exposed to radiation from fluoroscopy. Systems intended to reduce radiation exposure, such as the use of electroanatomic mapping and remote navigation systems, are available.

Various catheter-based systems have been cleared for marketing via the 510(k) process; e.g., the Cardioblate® system (Medtronic, Inc.) has been cleared for “[ablation] of cardiac tissue during general surgery using radiofrequency energy.”

IV. RATIONALE

Supraventricular Arrhythmias

Paroxysmal supraventricular tachycardia (PSVT). PSVT arises as a result of abnormal conduction through the atioventricular (AV) node or through accessory conduction pathways that bypass the AV node. There are several subtypes of PSVT, the most common being AV
nodal re-entrant tachycardia (AVNRT). (1) Ablations for PSVT can usually be done in the right atrium, thus reducing the risk of entering the left atrium through transseptal puncture. Since these ablations are very focused and confined to the right side of the heart, complications are less than with other ablations. The main complication of ablation is high-grade AV block that may require placement of a pacemaker.

Evidence on the efficacy of catheter ablation for PSVT consists of numerous case series and uncontrolled trials. There are no large-scale randomized, controlled trials (RCTs) that compare ablation to placebo or alternative treatments. The available evidence establishes that catheter ablation is associated with high rates of success in abolishing PSVT with low rates of AV block. For example, the North American Society of Pacing and Electrophysiology (NASPE) prospective catheter ablation registry reported on 1,197 patients undergoing ablation for AVNRT. Success in eliminating the arrhythmia was reported in 96.1% of patients, with a 1% incidence of second- or third-degree AV block. (1) The recurrence rate was estimated to be 3–7%.

Ablation of PSVT due to accessory pathways shows similar or slightly lower success rates. Most clinical series and registries report success in the 85–100% range. (2) In a survey covering 6,065 patients undergoing ablation during the period of 1997–2002, long-term success of accessory pathway ablation was 98%. Repeat procedures were necessary in 2.2% of cases, and a serious complication (i.e., tamponade, AV block, coronary artery injury, retroperitoneal hemorrhage, or stroke) occurred in 0.6% of patients. (2) The 1995 NASPE survey included 5,427 patients undergoing accessory pathway ablation. Serious complications occurred in 1.8% of patients (99/5,427), with a mortality rate of 0.08% (4/5,427).

Atrial flutter. Atrial flutter usually arises from re-entrant circuits, the most common of which is associated with the cavotricuspid isthmus. Success rates following ablation have varied, partly because of the evolution of the technique and partly because of varying definitions of recurrence. In a summary of studies that used current techniques and a stringent definition of treatment success, success rates of 90–100% were estimated. (1) One small RCT compared catheter ablation to medications for this arrhythmia. After a mean follow-up of 21 months, 80% of patients treated with ablation remained in sinus rhythm compared to only 36% of patients treated with medications. (1)

A survey of 7,071 procedures for isthmus-associated atrial flutter reported a success rate in preventing recurrent atrial flutter of 97%. (2) Repeat procedures were required in 4% of patients. Serious complications were reported in 0.4% of patients, the most common of which was AV block. Other reported complications included injury to the coronary arteries and ventricular arrhythmias.

Atrial flutter that is not associated with the cavotricuspid isthmus is less common, and there is less evidence for efficacy. In a combined analysis of 6 studies enrolling a total of 134 patients,
success rates in abolishing atrial flutter were 50–88% after an average follow-up of 2 years. (1) Expert opinion (2) has estimated that with the current availability of 3D-mapping systems, success for nonisthmus-dependent atrial flutter is expected to be at least 90%.

Focal atrial tachycardia. Focal atrial tachycardia usually arises from an abnormal automatic focus or micro-re-entry circuits in the right atrium. Ablation involves identification of the abnormal trigger by mapping studies, followed by focused ablation of the abnormal area.

Atrial tachycardias are relatively uncommon; as a result, the evidence on efficacy of catheter ablation is limited. Pooled data from 514 patients undergoing ablation reported a success rate of 86%, (1) with a recurrence rate of 8%. Serious complications occurred in 1–2% of patients, consisting of cardiac perforation, phrenic nerve damage, and sinus node dysfunction. In another combined analysis of 7 studies including 112 patients, success for ablation of focal atrial tachycardia was approximately 90%, with late recurrences reported in 7% of patients. (2)

Conclusions. For patients with supraventricular arrhythmias and identifiable arrhythmogenic foci, numerous uncontrolled studies report high success with low rates of adverse events. Success in eliminating PSVT following catheter ablation is likely to be in the range of 95% or higher, and success in eliminating atrial flutter to be in the 90-100% range. There is less evidence on focal atrial tachycardia, with reported success rates somewhat lower. For patients who desire to avoid medications, catheter ablation is a reasonable first-line alternative treatment for these supraventricular arrhythmias.

Ventricular Arrhythmias

Ventricular tachycardia in patients with structural heart disease (“scar-related VT”). Ventricular tachycardia most commonly occurs in the setting of underlying structural heart disease. Ventricular tachycardia in a patient with structural heart disease is usually precipitated by scar tissue in the left ventricle. (3) Scar tissue can arise as a result of myocardial infarction (MI) or it can result from fibrosis of myocardium that occurs with nonischemic cardiomyopathy. Ablation in patients with structural heart disease is more difficult than for patients with idiopathic ventricular tachycardia. This is because larger areas of ablation are typically required, there are often multiple areas that require ablation, and because patients with structural heart disease are at higher risk for complications at baseline.

Evidence on the efficacy of ablation for these patients comes largely from case series and a few controlled studies. Mallidi et al. (4) performed a systematic review of all controlled studies of catheter ablation for ventricular arrhythmias. Five controlled studies with a total of 457 patients were identified. Four of these were randomized, controlled studies (RCTs), although 2 were unpublished, and the fifth was a small non-randomized controlled study from Japan. There was a decreased overall risk of VT recurrence for patients undergoing catheter ablation compared to treatment without ablation (odds ratio [OR]: 0.62; 95% confidence interval [CI]: 0.51-0.76). In
the 2 unpublished RCTs, the absolute reduction in VT recurrence was reported to be 26% and 13%, although statistical testing for these differences was not reported. Combined analysis of complications concluded the following rates of adverse events: death (1%), stroke (1%), cardiac perforation (1%), and complete heart block (1.6%).

The 2 published RCTs evaluate catheter ablation plus implantable cardioverter-defibrillator (ICD) to ICD alone for patients with ventricular tachycardia and previous MI. These studies were designed to evaluate whether catheter ablation can reduce the number of ICD discharges. The SMASH-VT study (5) randomly assigned 128 patients with ventricular tachycardia or ventricular fibrillation and a prior MI who were not receiving antiarrhythmic medications. Mean follow-up was 22.5 (+/-5.5) months. The primary endpoint was survival free from any appropriate ICD therapy (shocks or antitachycardia pacing). Major complications related to catheter ablation occurred in 4.7% (3/64) patients. One patient had a pericardial effusion that did not require intervention, 1 patient had worsening heart failure that required prolonged hospitalization, and 1 patient had a deep vein thrombosis that required anticoagulation. The primary endpoint was reached by 12% (8/64) of patients in the ablation group compared with 33% (21/64) in the defibrillator alone group (hazard ratio [HR]: 0.31; 95% CI: 0.13-0.76; p=0.01). There were fewer deaths in the ablation group (3/64 vs. 6/64, respectively), but this difference did not reach statistical significance (p=0.29). There was no difference in New York Heart Association class at the end of follow-up.

The Ventricular Tachycardia Ablation in Coronary Heart Disease (VTACH) study (6) randomly assigned 110 patients from 16 centers in Europe with stable ventricular tachycardia, previous MI, and left-ventricular ejection fraction less than 50% to catheter ablation plus ICD versus ICD alone. Antiarrhythmic medications were allowed at the discretion of the treating clinician. Of 52 patients assigned to ablation, 7 did not undergo the procedure. Twelve of 55 patients in the ICD-alone group crossed over to the ablation group. All analyses were performed using intention-to-treat analysis. Patients were followed for a mean of 22.5 (+/-9.0) months for the primary endpoint of first recurrence of ventricular tachycardia or ventricular fibrillation. Time to the primary outcome was 18.6 months in the ablation group compared with 5.9 months in the ICD-alone group (p=0.045). By Kaplan Meier analysis, 59% of patients in the ablation group, compared to 40% in the ICD-alone group, were free of any ventricular tachycardia or fibrillation event at 12 months of follow-up. Quality of life (QOL) data, measured by the Short Form (SF)-36 instrument, were available for a subset of patients (n varied between 20 and 30 in each group). There were no significant between-group differences in any of the QOL measures. There was a significant difference in the secondary outcome of hospitalizations in favor of the ablation group (HR: 0.55; 95% CI: 0.30–0.99; p=0.04). There were no differences in the other secondary outcomes of death, ventricular tachycardia “storm,” or syncope.

Several prospective, multicenter case series have been published. The largest multicenter case series is the Multicentre Thermocool Ventricular Tachycardia Ablation Trial, (7) which enrolled 231 patients from 18 centers with recurrent ventricular tachycardia and prior MI. These patients
had a high burden of ventricular tachycardia (median: 11 episodes in the prior 6 months), and 70% had previously failed treatment with amiodarone. Mortality within 7 days of the procedure occurred in 3% of patients (7/231); 4 of these deaths occurred in the electrophysiology lab at the time of the procedure. Significant complications occurred in 7.3% of patients (27/231). The primary endpoint of freedom from recurrent incessant or intermittent ventricular tachycardia was achieved in 53% of patients (123/231). Mortality at 1 year of follow-up was 18%. Approximately one-third of the deaths were attributed to arrhythmias, one-third to heart failure, and one-third to other causes.

Calkins et al. (8) enrolled 146 patients from 18 clinical centers who had stable ventricular tachycardia, ischemic heart disease, an implantable cardioverter-defibrillator (ICD), and who had failed at least 2 prior antiarrhythmic medications. Acute procedural success was achieved in 75% of patients. After a mean follow-up of 243 (+/-153) days, 46% of patients experienced a recurrence of any tachyarrhythmia. Major complications occurred in 8% of patients (12/146), including stroke/TIA (2.7%), tamponade (2.7%), complete heart block (1.4%), valve injury (0.7%), MI (0.7%), and femoral artery laceration (0.7%). Four of these complications lead to death for a periprocedural mortality rate of 2.7%.

The Euro-VT study (9) enrolled 63 patients from 8 centers in Europe with sustained ventricular tachycardia and prior MI who were refractory to previous drug and/or device therapy. Two-thirds of the patients had prior ICD implantation. Procedural success was achieved in 81% of patients. Freedom from ventricular tachycardia at 12 months was approximately 45% by Kaplan Meier analysis. During a mean follow-up of 12 (+/-3) months, 49% of patients (31/63) developed a recurrence of ventricular tachycardia. There were no deaths within 30 days of the procedure. One patient experienced a serious complication, with ventricular tachycardia degenerating to ventricular fibrillation during the procedure, necessitating cardiopulmonary resuscitation.

Conclusions. There are 2 RCTs that evaluate catheter ablation versus usual care in patients with ventricular arrhythmias and an automatic ICD (AICD). Both studies reported that procedural success was high and that catheter ablation was successful in reducing the number of VT episodes and reducing the number of AICD shocks. The rate of serious procedural adverse events was low in these trials. Observational studies have corroborated a decrease in VT following catheter ablation in similar patient populations. This evidence is sufficient to conclude that catheter ablation improves outcomes for patients with VT and an AICD when the frequency of VT episodes and AICD shocks are not adequately controlled by medications.

Idiopathic ventricular tachycardia. Idiopathic ventricular tachycardia refers to tachycardia that occurs in the absence of demonstrable heart disease. It most commonly arises from the right-ventricular outflow tract, although it sometimes arises from the left-ventricular outflow tract or other cardiac structures. (3) Idiopathic ventricular tachycardia is relatively benign when compared to other forms of ventricular tachycardia; it is usually well-tolerated and sudden death is rare.
Because idiopathic ventricular tachycardia is an uncommon disorder, there is limited evidence on the efficacy of catheter ablation, and the available evidence consists of small clinical series. In a series of 48 patients, (10) success of catheter ablation in eliminating the focus was achieved in 83% (29/35) of patients with right-ventricular outflow tract ventricular tachycardia and 92% (12/13) patients with left-ventricular outflow tract ventricular tachycardia. In several other small series, the success of ablation in abolishing the ventricular tachycardia focus ranged from 54–92%. (11-13) Recurrence rates of ventricular tachycardia at variable times of follow-up ranged from 0–14%.

Another series of 44 patients was reported by Pytkowski et al. in 2012. (14) This series included both patients with VT (n=23) and frequent premature ventricular contractions (PVCs) (n=21) originating from the right ventricular outflow tract. All patients underwent successful ablation and were followed up at 3 months. The primary outcome was improvement in QOL, as measured by a change in the SF-36 questionnaire. A statistically significant improvement was reported on 6 of 8 domains. However, there were no significant improvements on the physical or mental component summary score.

Conclusions. There is a limited amount of evidence for treatment of patients with structurally normal hearts. Small case series report high success in eliminating the focus of arrhythmia, with a low rate of serious adverse effects, and a relatively low rate of recurrence. This evidence suggests that there is a benefit to catheter ablation for this population but is not conclusive due to the small numbers of patients and the lack of controlled trials.

Incessant ventricular tachycardia (“storm”). Incessant ventricular tachycardia, or “ventricular tachycardia storm,” refers to tachycardia that occurs more than 3 times in a 24-hour period, often in association with an acute cardiac event such as MI. Ventricular tachycardia storm is a potentially life-threatening situation that requires rapid treatment and control. The evidence base for this indication consists of small case series describing outcomes after treatment with catheter ablation.

A systematic review of case series was published in 2012, including 39 reports with a total of 471 patients. (15) Successful termination of all ventricular arrhythmias was achieved in 72% of cases (95% CI: 71-89%), and treatment failure occurred in 9% (95% CI: 3-10%). There were 3 deaths associated with the procedure (0.6%), and a recurrence of ventricular tachycardia storm in 6%. During a mean follow-up of 61 weeks, 17% of patients died, with approximately one-quarter of all deaths attributed to arrhythmias. The risk of death was approximately 4 times higher for patients with a failed procedure compared to patients with a successful procedure.

One of the larger series of patients was reported by Carbucicchio et al. (16) This was a series of 95 patients with an ICD and drug-refractory ventricular tachycardia storm, the majority of whom had coronary artery disease. Catheter ablation was successful in acutely suppressing ventricular tachycardia storm in all patients, although some patients required a second or third procedure to
achieve control. All ventricular tachycardias were eliminated in 89% of patients. After a mean follow-up of 22 months, 92% of patients (87/95) remained free of ventricular tachycardia storm, and 12% (11/95) patients died of cardiac causes.

Other smaller series also report similar outcomes of ablation in ventricular tachycardia storm. (17, 18) For example, Arya et al. (17) reported on 30 patients with ischemic heart disease and ventricular tachycardia storm who were treated with catheter ablation using a remote magnetic navigation system. Acute success, defined as suppression of all ventricular tachycardia, was achieved in 80% of patients. After a mean follow-up of 7.8 months, 70% of patients (21/30) remained free of ventricular tachycardia. No serious complications related to ablation were reported.

Deneke et al. (18) reported on 32 patients with electrical storm treated with catheter ablation as part of a 7-hospital collaborative network. There was one periprocedural death (3.1%) due to ventricular tachycardia (VT) and mechanical dissociation that occurred during the procedure. Complete success, defined as the acute suppression of all inducible arrhythmias, was achieved in 60% (19/32) patients, and partial success was achieved in 31.3% (10/32). In 6% of patients (2/32), ablation failed to suppress all clinically relevant arrhythmias. After a mean follow-up of 15 months, recurrent VT occurred in 31% of patients (10/31), and VT storm recurred in 6% (2/31).

Conclusions. Case series report high procedural success rates for catheter ablation in ventricular tachycardia storm. Serious complications occur at reasonably low rates, and mortality from the procedure was reported to be 0.6% in a meta-analysis of case series. Because of the emergency nature of this condition, RCTs are not expected to be performed. In addition, there are no other available treatment options for a patient with VT storm who fails pharmacologic interventions.

Clinical Input Received through Physician Specialty Societies and Academic Medical Centers

While the various physician specialty societies and academic medical centers may collaborate with and make recommendations during this process, through the provision of appropriate reviewers, input received does not represent an endorsement or position statement by the physician specialty societies or academic medical centers, unless otherwise noted. Clinical vetting was obtained following the November 2011 update. There was uniform agreement on treatment of supraventricular arrhythmias and general agreement for treatment of ventricular arrhythmias. Input was near uniform on the medical necessity of catheter ablation to treat ventricular tachycardia storm, or incessant VT. Reviewers were mixed as to whether this should be a first-line treatment for VT storm but were near uniform for use of catheter ablation in patients with VT storm that fails to respond to pharmacologic treatment.

Summary
Catheter ablation is an established and widely used technique in the treatment of supraventricular arrhythmias. While large-scale RCTs of efficacy are lacking for paroxysmal supraventricular tachycardia (PSVT), numerous clinical series report very high success rates at well over 90%. Serious complications, mainly consisting of atrioventricular (AV) block requiring pacemaker insertion, occur in approximately 1% of patients. High success rates are also reported for atrial flutter and focal atrial tachycardia, although the evidence is less robust than for PSVT. Therefore, these procedures offer a very favorable risk-benefit ratio for supraventricular arrhythmias and can be considered medically necessary.

For ventricular arrhythmias, the use of catheter ablation is less well-established. Two small RCTs in patients with an implantable cardioverter defibrillator (ICD) demonstrated a reduction in the number of ICD discharges for ventricular arrhythmias following catheter ablation, and a systematic review of controlled trials reports a 31% reduction in ventricular tachycardia (VT) recurrence associated with ablation. Clinical series demonstrate that acute success can be achieved in a high percentage of patients, in the range of 80-90%. Late recurrences do occur, but the majority of patients treated with ablation remain free of ventricular tachycardia at 1-2 years’ follow-up. This evidence establishes that ablation for ventricular tachycardia reduces the future occurrence of ventricular arrhythmias. As a result, it is reasonable to recommend ablation as a treatment for patients with ventricular arrhythmias that are not controlled by ICD implantation and medications. As a result, catheter ablation may be considered medically necessary for these patients.

The evidence is limited on treatment of VT “storm”. A few small case series of patients with VT storm report high acute success and favorable long-term response rates for catheter ablation. Based on this data, together with the results of clinical vetting, the lack of alternative treatments, and the infeasibility of performing clinical trials, catheter ablation may be considered medically necessary for patients with VT storm who fail to respond to pharmacologic treatment.

Clinical Practice Guidelines and Position Statements

Practice Guidelines and Position Statements

Supraventricular arrhythmias

The American College of Cardiology/American Heart Association/European Society for Cardiology (ACC/AHA/ESC) guidelines for the management of patients with supraventricular arrhythmias (1) includes the following recommendations for catheter ablation:

- **PSVT (AVNRT)**
  - Recurrent, symptomatic AVNRT (Class I recommendation; level of evidence B)
  - Infrequent AVNRT in patients who desire complete control of arrhythmia (Class I recommendation; level of evidence B).
Infrequent, well-tolerated AVNRT (Class I recommendation; level of evidence B)

- **PSVT (accessory pathway)**
  - Poorly tolerated supraventricular tachycardia (SVT) with no pre-excitation (Class I recommendation; level of evidence B)
  - Infrequent SVT, no pre-excitation (Class IIa recommendation; level of evidence B)
  - Poorly tolerated SVT with pre-excitation (Class I recommendation; level of evidence B)
  - Asymptomatic, with pre-excitation (Class IIa recommendation; level of evidence B)

- **Atrial flutter**
  - Poorly tolerated atrial flutter (Class I recommendation; level of evidence B)
  - Recurrent, well-tolerated atrial flutter (Class I recommendation; level of evidence B)
  - First episode atrial flutter, well-tolerated (Class IIa recommendation; level of evidence B)
  - Normal-thymus-dependent atrial flutter, symptomatic and refractory to medications (Class IIa recommendation; level of evidence B)
  - Atrial flutter associated with class IC drugs or amiodarone (Class IIa recommendation; level of evidence C)

- **Focal atrial tachycardia**
  - Recurrent, symptomatic atrial tachycardia (Class I recommendation; level of evidence B)
  - Incessant atrial tachycardia (Class I recommendation; level of evidence B)
  - Nonsustained, asymptomatic atrial tachycardia (Class III recommendation; level of evidence C)

### Ventricular arrhythmias

The European Heart Rhythm Association and the Heart Rhythm Society, in conjunction with the American College of Cardiology and the American Heart Association, published an expert consensus document in 2009 on the use of catheter ablation for ventricular arrhythmias. (19) These recommendations were based on review of the literature and clinical experience. However, in the vast majority of indications, high-quality evidence was lacking, and recommendations were primarily based on expert opinion. Catheter ablation was recommended for the following indications:

- Recurrent ventricular tachycardia refractory to antiarrhythmic medications
- Incessant ventricular tachycardia (ventricular tachycardia storm) that is not due to a reversible cause
- Frequent ventricular tachycardia, that is presumed to cause ventricular dysfunction
- Bundle branch reentrant or interfascicular ventricular tachycardia
• Recurrent refractory sustained ventricular tachycardia or ventricular fibrillation with a trigger amenable to ablation

The ACC/AHA/ESC 2006 guidelines on the management of patients with ventricular arrhythmias contain the following recommendations for catheter ablation (20):

• **Incessant ventricular tachycardia (ventricular tachycardia storm):**
  - Intravenous amiodarone or procainamide followed by ventricular tachycardia ablation can be effective in the management of patients with frequently recurring or incessant monomorphic ventricular tachycardia (Class IIa recommendation; Level of evidence B).

• **Scar-related ventricular tachycardia associated with prior MI:**
  - Adjunctive therapies to the ICD, including catheter ablation or surgical resection, and pharmacologic therapy with agents such as amiodarone or sotalol are reasonable to improve symptoms due to frequent episodes of sustained ventricular tachycardia or ventricular fibrillation in patients with left-ventricular dysfunction due to prior MI (Class IIa recommendation; level of evidence C).
  - Curative catheter ablation or amiodarone may be considered in lieu of ICD therapy to improve symptoms in patients with left-ventricular dysfunction due to prior MI and recurrent hemodynamically stable ventricular tachycardia whose ejection fraction is greater than 40%. (Class IIb recommendations; Level of evidence B).

• **Idiopathic ventricular tachycardia:**
  - Catheter ablation is useful in patients with structurally normal hearts with symptomatic, drug-refractory ventricular tachycardia arising from the right or left ventricle or in those who are drug intolerant or who do not desire long-term drug therapy (Class I recommendation; Level of evidence C).

V. **DEFINITIONS**

**Atrial Flutter** is a cardiac arrhythmia marked by rapid (about three hundred beats per minute) regular atrial beating, and, usually, a regular ventricular response.

**Atrioventricular (AV) Node** is an area of specialized cardiac muscle that receives the cardiac impulse from the sinoatrial (SA) node and conducts it to the AV bundle and then to the Purkinje fibers and the walls of the ventricles. The AV node is located in the septal wall between the left and right atria.

**Atrium** is the upper chamber of each half of the heart. Atria is the plural of atrium.

**Myocardium** is the middle layer of the walls of the heart, composed of cardiac muscle.
SINOTRIAL (SA) NODE is a specialized group of cardiac muscle cells in the wall of the right atrium at the entrance to the superior vena cava. These cells depolarize spontaneously and rhythmically to initiate normal heartbeats.

SUPRAVENTRICULAR TACHYCARDIA (SVT) is any cardiac rhythm with a rate exceeding one hundred (100) beats per minute that originates above the branching part of the atrioventricular bundle, that is, in the sinus node, atria, or AV junction.

TACHYCARDIA is an abnormally rapid heart rate, greater than one hundred (100) beats per minute.

V. BENEFIT VARIATIONS

The existence of this medical policy does not mean that this service is a covered benefit under the member's contract. Benefit determinations should be based on the applicable contract language. Medical policies do not constitute a description of benefits. A member’s individual or group customer benefits govern which services are covered, which are excluded, and which are subject to benefit limits and which require preauthorization. Members and providers should consult the member’s benefit information or contact Capital for benefit information.

VI. DISCLAIMER

Capital’s medical policies are developed to assist in administering a member’s benefits, do not constitute medical advice and are subject to change. Treating providers are solely responsible for medical advice and treatment of members. Members should discuss any medical policy related to their coverage or condition with their provider and consult their benefit information to determine if the service is covered. If there is a discrepancy between this medical policy and a member’s benefit information, the benefit information will govern. Capital considers the information contained in this medical policy to be proprietary and it may only be disseminated as permitted by law.

VII. REFERENCES


19. Aliot EM, Stevenson WG, Almendral-Garrote JM et al. EHRA/HRS Expert Consensus on Catheter Ablation of Ventricular Arrhythmias: developed in a partnership with the European Heart Rhythm Association (EHRA), a Registered Branch of the European Society of Cardiology (ESC), and the Heart Rhythm Society (HRS); in collaboration with the American College of Cardiology (ACC) and the American Heart Association (AHA). Europace 2009; 11(6):771-817.


VIII. CODING INFORMATION

IX. 

Note: This list of codes may not be all-inclusive, and codes are subject to change at any time. The identification of a code in this section does not denote coverage as coverage is determined by the terms of member benefit information. In addition, not all covered services are eligible for separate reimbursement.

Covered when medically necessary:

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MEDICAL POLICY

POLICY TITLE
CATHETER ABLATION FOR CARDIAC ARRHYTHMIAS

POLICY NUMBER
MP- 2.067

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<td>427.0</td>
<td>PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA</td>
</tr>
<tr>
<td>427.1</td>
<td>PAROXYSMAL VENTRICULAR TACHYCARDIA</td>
</tr>
<tr>
<td>427.2</td>
<td>UNSPECIFIED PAROXYSMAL TACHYCARDIA</td>
</tr>
<tr>
<td>427.31</td>
<td>ATRIAL FIBRILLATION</td>
</tr>
<tr>
<td>427.32</td>
<td>ATRIAL FLUTTER</td>
</tr>
<tr>
<td>427.60-427.69</td>
<td>PREMATURE BEATS</td>
</tr>
<tr>
<td>427.81</td>
<td>SINOATRIAL NODE DYSFUNCTION</td>
</tr>
<tr>
<td>427.89</td>
<td>OTHER SPECIFIED CARDIAC DYSRHYTHMIAS</td>
</tr>
<tr>
<td>427.9</td>
<td>CARDIAC DYSRHYTHMIA, CARIDAC ARRHYTHMIA</td>
</tr>
</tbody>
</table>

*If applicable, please see Medicare LCD or NCD for additional covered diagnoses.

The following ICD-10 diagnosis codes will be effective October 1, 2015

<table>
<thead>
<tr>
<th>ICD-10-CM Diagnosis Code*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I47.1</td>
<td>Supraventricular tachycardia</td>
</tr>
<tr>
<td>I47.2</td>
<td>Ventricular tachycardia</td>
</tr>
</tbody>
</table>

IX. POLICY HISTORY

<table>
<thead>
<tr>
<th>MP-2.067</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAC 1/28/03</td>
<td></td>
</tr>
<tr>
<td>CAC 1/27/04</td>
<td></td>
</tr>
<tr>
<td>CAC 4/27/04</td>
<td></td>
</tr>
<tr>
<td>CAC 11/30/04</td>
<td></td>
</tr>
<tr>
<td>CAC 9/13/05</td>
<td></td>
</tr>
<tr>
<td>CAC 9/26/06</td>
<td></td>
</tr>
<tr>
<td>CAC 4/24/07</td>
<td></td>
</tr>
<tr>
<td>CAC 11/27/07</td>
<td></td>
</tr>
<tr>
<td>CAC 11/25/08</td>
<td></td>
</tr>
<tr>
<td>CAC 5/26/09</td>
<td></td>
</tr>
<tr>
<td>CAC 11/24/09</td>
<td>Repeat procedures may be considered medically necessary in specific situations. Info on maze procedures and repeat ablations was added to the background/description section.</td>
</tr>
</tbody>
</table>
### MEDICAL POLICY

<table>
<thead>
<tr>
<th>POLICY TITLE</th>
<th>CATHETER ABLATION FOR CARDIAC ARRHYTHMIAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLICY NUMBER</td>
<td>MP- 2.067</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Date</strong></th>
<th><strong>Update</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CAC 4/26/11</strong></td>
<td>Adopted BCBSA. Information regarding Maze procedure and pulmonary vein ablation was moved to separate policies. BCBSA language adoption did not change intent of policy criteria.</td>
</tr>
<tr>
<td><strong>10/12/11</strong></td>
<td>FEP variation revised to refer to FEP medical policy manual MP-2.02.01 Catheter Ablation for Cardiac Arrhythmias</td>
</tr>
<tr>
<td><strong>CAC 8/28/12</strong></td>
<td>Minor revision. Policy revised to indicate that catheter ablation for treatment of VT storm is medically necessary for patients who fail pharmacologic therapy. Catheter ablation for all other ventricular arrhythmias is considered investigational. Policy guidelines have been added.</td>
</tr>
<tr>
<td><strong>1/03/13</strong></td>
<td>New 2013 codes added to policy-skb</td>
</tr>
<tr>
<td><strong>04/22/13</strong></td>
<td>Admin code review.</td>
</tr>
<tr>
<td><strong>CAC 7/30/13</strong></td>
<td>Consensus list review</td>
</tr>
<tr>
<td><strong>CAC 3/25/14</strong></td>
<td>Consensus review. References updated. No change to the policy statements. Rationale added. Policy coded.</td>
</tr>
</tbody>
</table>

*Health care benefit programs issued or administered by Capital BlueCross and/or its subsidiaries, Capital Advantage Insurance Company®, Capital Advantage Assurance Company®, and Keystone Health Plan® Central, Independent licensees of the BlueCross BlueShield Association. Communications issued by Capital BlueCross in its capacity as administrator of programs and provider relations for all companies.*