Cigna Medical Coverage Policy

Subject  
Percutaneous Alcohol Septal Ablation for Hypertrophic Cardiomyopathy

Effective Date ...................... 6/15/2014
Next Review Date ...................... 6/15/2015
Coverage Policy Number ................. 0090

Table of Contents
Coverage Policy .................................................. 1
General Background ........................................... 1
Coding/Billing Information ................................. 6
References .......................................................... 7

Hyperlink to Related Coverage Policies
Biventricular Pacing/Cardiac Resynchronization Therapy (CRT)
Cardiac Event Monitors
Implantable Cardioverter Defibrillator (ICD)

INSTRUCTIONS FOR USE
The following Coverage Policy applies to health benefit plans administered by Cigna companies. Coverage Policies are intended to provide guidance in interpreting certain standard Cigna benefit plans. Please note, the terms of a customer's particular benefit plan document [Group Service Agreement, Evidence of Coverage, Certificate of Coverage, Summary Plan Description (SPD) or similar plan document] may differ significantly from the standard benefit plans upon which these Coverage Policies are based. For example, a customer's benefit plan document may contain a specific exclusion related to a topic addressed in a Coverage Policy. In the event of a conflict, a customer's benefit plan document always supersedes the information in the Coverage Policies. In the absence of a controlling federal or state coverage mandate, benefits are ultimately determined by the terms of the applicable benefit plan document. Coverage determinations in each specific instance require consideration of 1) the terms of the applicable benefit plan document in effect on the date of service; 2) any applicable laws/regulations; 3) any relevant collateral source materials including Coverage Policies and; 4) the specific facts of the particular situation. Coverage Policies relate exclusively to the administration of health benefit plans. Coverage Policies are not recommendations for treatment and should never be used as treatment guidelines. In certain markets, delegated vendor guidelines may be used to support medical necessity and other coverage determinations. Proprietary information of Cigna. Copyright ©2014 Cigna

Coverage Policy
Cigna covers percutaneous alcohol septal ablation (ASA) for an adult with hypertrophic cardiomyopathy as medically necessary when performed as an alternative to surgical septal myectomy and ALL of the following criteria are met:

- severe heart failure symptoms (New York Heart Association [NYHA] class III or IV) (see below Appendix I); with failure, contraindication, or intolerance to pharmacological therapy
- left ventricular (LV) outflow tract gradient ≥ 50 mm Hg at rest or after provocation (with physiological exercise)
- surgical septal myectomy is contraindicated or the surgical risk is considered unacceptable because of one or more serious comorbidities or advanced age

Cigna does not cover alcohol septal ablation (ASA) for any other indication because it is considered experimental, investigational or unproven.

General Background
Hypertrophic cardiomyopathy (HCM) is a genetic cardiovascular disease characterized by left ventricular hypertrophy, disorganization of cardiac myocytes and myofibrils, myocardial fibrosis, and small-vessel disease. Asymmetrical septal hypertrophy is the most common type of HCM in the West, accounting for 70–75% of cases. Other types of hypertrophic cardiomyopathy include basal septal hypertrophy (10–15%), concentric hypertrophy (5%), hypertrophy of the lateral wall (1–2%), and apical hypertrophy (<5%). Diagnosis of HCM is
generally established with two-dimensional echocardiography, and the degree of left ventricular obstruction is assessed with continuous wave Doppler echocardiography.

The incidence of HCM is approximately one in 500 in the United States. Symptoms may include chest pain, palpitations, dyspnea, and syncope, although many patients are asymptomatic. The first clinical sign of the condition may be sudden cardiac death, which may occur at any age, frequently during or following physical exertion. The implantable cardioverter defibrillator (ICD) has altered the course of HCM for many patients by aborting potentially lethal ventricular arrhythmias, as secondary prevention following cardiac arrest, or as primary prevention for those with risk factors. Elderly patients are less likely to receive ICDs, since HCM-related sudden death is not common in elderly patients, and survival to an advanced age in itself usually indicates lower risk status.

Treatment of hypertrophic cardiomyopathy (HCM) is determined by symptom severity. Medical treatment is directed toward symptom relief and prevention of endocarditis, arrhythmias, and sudden death by reducing the left ventricular outflow pressure gradient. Pharmacological therapy may include beta-adrenergic blockers, calcium-channel antagonists, and diuretics. Based on extensive experience over more than 45 years, surgical septal myectomy remains the preferred treatment option for most patients. Septal myectomy is established as the most effective and proven approach for reversing the consequences of heart failure resulting from HCM, by providing relief of obstruction and mitral regurgitation at rest, and restoring functional capacity and acceptable quality of life beyond what would be achievable with long term pharmacological therapy. The procedure has low operative mortality (1–3%) at experienced centers. Complications are rare; the risk of complete heart block is approximately 2%, although higher in patients with preexisting right bundle-branch block or prior alcohol septal ablation. The risk of ventricular septal defect or aortic valve or mitral valve injury is less than 1%. Septal myectomy is associated with persistent, long-lasting improvement in disabling symptoms and exercise capacity.

Percutaneous alcohol septal ablation, also referred to as percutaneous transluminal septal myocardial ablation (PTSMA) and transcoronary ablation of septal hypertrophy (TASH), is an interventional procedure developed as an alternative to myectomy. Absolute alcohol is introduced using a percutaneous catheter approach to produce a localized infarction of the basal septum at the point of contact of the anterior mitral valve leaflet, reducing outflow tract gradient and associated mitral regurgitation. The ablation mimics the hemodynamic results of myectomy, reducing the basal septal thickness and enlarging the left ventricular outflow tract, reducing mechanical impedance to left ventricular ejection. Although surgical myectomy remains the gold standard alcohol septal ablation has been widely adopted. The procedure may be more acceptable to patients, since it does not require a surgical incision or general anesthesia, and is associated with a significantly shorter recovery time and less overall discomfort. Although ablation may result in significant hemodynamic and clinical improvement immediately following the procedure; improvement may be delayed for up to three months. Temporary complete heart block occurs in approximately half of patients undergoing ablation, and persistent complete heart block requiring pacemaker implantation occurs in 10%-20% of patients. In-hospital mortality up to 2% has been reported. Several studies have documented the occurrence of sustained ventricular arrhythmias and sudden cardiac death following septal ablation in 3%-10% of patients with or without known risk factors for SCD. Percutaneous alcohol septal ablation therefore may be indicated for treatment of HCM with LVOT obstruction and severe drug-refractory symptoms when surgical septal myectomy is contraindicated or surgical risk is considered unacceptable. (Maron, et al., 2003; McKenna and Elliott, 2007; Bonow: Braunwald’s Heart Disease, 2011; Gersh, 2011).

Literature Review
Nagueh et al. (2011) evaluated multicenter North American Registry data to identify the predictors of clinical outcome (mortality and survival without repeat septal reduction procedures) of alcohol septal ablation for treatment of patients with hypertrophic obstructive cardiomyopathy (n=874). Most patients (64%) had severe obstruction at rest, and the remaining patients had provable obstruction. Patients had severe dyspnea (New York Heart Association [NYHA] functional class III or IV; 78%) and/or severe angina (Canadian Cardiovascular Society angina class III or IV, 43%). Significant improvement in NYHA class and CCS angina scores occurred after ablation (p<0.01). There were 81 deaths; survival estimates at 1.5, and 9 years were 97%, 86%, and 74%, respectively. Left anterior descending artery dissection occurred in 8 patients, and arrhythmias in 133 patients. Variables that predicted mortality after ablation included lower ejection fraction at baseline, smaller number of septal arteries injected, a larger number of ablation procedures per patient, a higher septal thickness post-ablation, and the use of beta blockers post-ablation.
Jensen et al. (2011) reported long term outcomes of 313 alcohol ablation procedures performed in 179 patients with hypertrophic obstructive cardiomyopathy (HOCM) from 1999 to 2010 in four Scandinavian centers. One or more comorbidities was present in 69% of patients. The median LVOT gradient at rest was reduced from 58 mm Hg (range 34–89) at baseline to 12 mm Hg (range 8–24) at one year (p<0.001), and during Valsalva maneuver from 93 mm Hg (range 70–140) to 21 mm Hg (range 11–42) (p<0.001). The percentage of patients with syncope decreased from 18% to 2% (p<0.001), and the percentage of patients in NYHA class III/IV was reduced from 94% to 21% (p<0.001). The presence of NYHA class III/IV at the most recent follow-up of 2.9 ± 2.6 years was associated with diabetes, chronic obstructive pulmonary disease, and valve disease unrelated to HOCM. In-hospital mortality was 0.3%, and the ten-year survival rate was comparable to that in an age-and sex-matched background population.

Ralph-Edwards et al. (2005) compared outcomes following isolated surgical myectomy (n=60) and alcohol ablation (n=54) in symptomatic adults treated at a single center between 1998 and 2003. Adjustments using a propensity score were used in the clinical and hemodynamic outcomes to accommodate for the differences in baseline patient characteristics and the lack of randomization. There were five late deaths in the ablation group and one late death after myectomy. Both procedures offered substantial clinical improvement for patients with HOCM, and there was no significant difference in post-intervention pacing, after adjustment for baseline variables. Significantly more patients achieved the defined optimal outcome (defined as survival, NYHA functional class I, no post-procedure pacemaker placement, and follow-up resting left ventricular outflow gradient of less than 20 mm Hg) after myectomy (73%) than after alcohol ablation (22%). The authors noted that the results from this study may not be generally applicable, as surgical myectomy is an established procedure at their facility, and ablation is a new, evolving technique.

Systematic Reviews/Meta-Analyses

Agarwal et al. (2010) conducted a systematic review and meta-analysis of comparative studies of septal myectomy (SM) and septal ablation (SA) for the treatment of hypertrophic obstructive cardiomyopathy (HOCM). The analysis included twelve prospective/retrospective cohorts and case control observational studies comparing outcomes of SA with SM in adults with refractory HOCM. There were no significant differences between short term and long term mortality, post-interventional functional status, or improvement in New York Heart Association (NYHA) functional class between the two groups. In addition, no significant differences were found in occurrence of ventricular arrhythmias, rate of re-interventions, or post-procedure mitral regurgitation. Septal ablation, however, was found to increase the rate of right bundle branch block and the need for post-procedure pacemaker implantation. Both procedures were effective in reducing the left ventricular outflow tract gradient (LVOTG) but there was a small but significantly higher residual LVOTG among the SA group compared to the SM group. The authors concluded that the choice of treatment strategy should be made after a thorough discussion of the procedures with the individual patient, because although SA does show promise due to similar mortality rates and functional status compared to SM, it is associated with higher conduction abnormalities and a higher post-intervention LVOTG.

Systematic reviews of surgical myectomy and alcohol septal ablation were conducted by Leonardi et al. (2010) to compare rates of rates of overall mortality and sudden cardiac death after treatment. The authors noted that unlike myectomy in which a hypertrophied area of septal myocardium is resected, ASA results in a focal myocardial infarction with replacement of myocardium by fibrosis. There is concern that this scar may act as an arrhythmogenic substrate, predisposing the patient to ventricular tachyarrhythmias and sudden cardiac death. The analysis included 19 septal ablation studies (2207 patients) and eight myectomy studies (1887 patients).
The median follow-up was shorter for alcohol septal ablation studies than myectomy studies (51 vs. 1266 patient years). Unadjusted rates of all-cause mortality and sudden cardiac death for septal ablation compared to myectomy were 0.021 vs. 0.018 (p=0.37) and 0.004 vs. 0.003 (p=0.36), respectively. Patients treated with alcohol septal ablation were older (weighted mean age 55 vs. 44 years, p<0.001), and had less septal hypertrophy (weighted mean, 21 vs. 23 mm, p<0.001) than those treated with myectomy. The odds ratio for treatment effect on all cause mortality and sudden cardiac death, after adjusting for baseline characteristics, were each lower for patients treated with alcohol septal ablation (0.28) than for those treated with myectomy (0.32).

Alam et al. (2009) conducted a meta-analysis of alcohol septal ablation vs. myectomy for hypertrophic obstructive cardiomyopathy (HOCM). Five non-randomized studies were included. Of 351 patients, 183 underwent alcohol septal ablation (ASA) and 168 underwent myectomy. All patients were in NYHA class II-IV, and baseline left ventricular outflow tract (LVOT) gradient was comparable in both groups. After septal reduction therapy, resting LVOT gradient was < 20 mm Hg in both groups at follow-up. Patients who underwent myectomy had lower LVOT gradient (18.2 ± 6.7 vs. 10.8 ± 6.3 mm Hg, p<0.001). Comparable improvements in NYHA class were seen in both groups at follow-up (1.5 ± 0.3 for ASA vs. 1.3 ± 0.2 for myomectomy, p=0.2). Permanent pacemaker implantation for complete heart block was required in a higher percentage of ASA patients (18.4 ± 7.9 vs. 3.3 ± 3.9, p=0.04). There was no significant difference in hospital mortality between the two groups.

ECRI
An ECRI Institute Health Technology Assessment, Percutaneous Transcoronary Septal Myocardial Ablation for Hypertrophic Cardiomyopathy (ECRI, 2002), states that the available studies, consisting of two retrospective controlled studies comparing PTSMA and myectomy and seven retrospective uncontrolled case series, had relatively weak designs. The latter design cannot separate placebo effects from improvement due to an actual treatment effect. The retrospective comparative studies are vulnerable to selection bias that could make a treatment appear to be more effective than it actually is relative to the comparison treatment. The report concluded that PTSMA was associated with improvement of HOCM symptoms, and that results were comparable to surgical myectomy. The report states that better-designed trials are needed to allow definitive conclusions regarding the relative effectiveness of PTSMA and surgical myectomy.

Professional Societies/Organizations
The 2011 American College of Cardiology Foundation (ACCF) / American Heart Association Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy, developed in collaboration with the American Association for Thoracic Surgery, American Society of Echocardiography, American society of Nuclear Cardiology, Heart Failure Society of American, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons, provides updated recommendations for invasive treatment. Guideline recommendations are classified as Class I, Class IIa, Class IIb, and Class III. The classification system is described as follows:

- **Class I:** Benefit >>> Risk; Procedure/Treatment should be performed/administered
- **Class IIa:** Benefit >> Risk; Additional studies with focused objectives needed. It is reasonable to perform procedure/administer treatment
- **Class IIb:** Benefit ≥ Risk; Additional studies with broad objectives needed; additional registry data would be helpful. Procedure/treatment may be considered.
- **Class III:** No benefit, or Class III: Harm

The weight of evidence supporting each recommendation is classified as follows:

- **Level A:** Multiple populations evaluated. Data derived from multiple randomized clinical trials or meta-analyses.
- **Level B:** Limited populations evaluated. Data derived from a single randomized trial or nonrandomized studies.
- **Level C:** Very limited populations evaluated. Only consensus opinion of experts, case studies, or standard of care.

The 2011 guideline provides the following recommendations for invasive therapies for treatment of hypertrophic cardiomyopathy:

Class I
• Septal reduction therapy should be performed only by experienced operators in the context of a comprehensive hypertrophic cardiomyopathy (HCM) clinical program and only for the treatment of eligible patients with severe drug-refractory symptoms and left ventricular outflow tract (LVOT) obstruction. (Level of Evidence: C)

Class Ila
• Consultation with centers experienced in performing both surgical septal myectomy and alcohol septal ablation is reasonable when discussing treatment options for eligible patients with HCM with severe drug-refractory symptoms and LVOT obstruction. (Level of Evidence: C)

• Surgical septal myectomy, when performed in experienced centers, can be beneficial and is the first consideration for the majority of eligible patients with HCM with severe drug-refractory symptoms and LVOT obstruction. (Level of Evidence: B)

• Surgical septal myectomy, when performed at experienced centers, can be beneficial in symptomatic children with HCM and severe resting obstruction (>50 mm Hg) for whom standard medical therapy has failed (Level of Evidence: C)

• When surgery is contraindicated or the risk is considered unacceptable because of serious comorbidities or advanced age, alcohol septal ablation, when performed in experienced centers, can be beneficial in eligible adult patients with HCM with LVOT obstruction and severe drug-refractory symptoms (usually NYHA functional classes III or IV). (Level of Evidence: B)

Class IIb
• Alcohol septal ablation, when performed in experienced centers, may be considered as an alternative to surgical myectomy for eligible adult patients with HCM with severe drug-refractory symptoms and LVOT obstruction when, after a balanced and thorough discussion, the patient expresses a preference for septal ablation. (Level of Evidence: B)

• The effectiveness of alcohol septal ablation is uncertain in patients with HCM with marked (i.e., >30 mm) septal hypertrophy, and therefore the procedure is generally discouraged in such patients. (Level of Evidence: C)

Class III: Harm
• Septal reduction therapy should not be done for adult patients with HCM who are asymptomatic with normal exercise tolerance or whose symptoms are controlled or minimized on optimal medical therapy. (Level of Evidence: C)

• Septal reduction therapy should not be done unless performed as part of a program dedicated to the longitudinal and multidisciplinary care of patients with HCM. (Level of Evidence: C)

• Mitral valve replacement for relief of LVOT obstruction should not be performed in patients with HCM in whom septal reduction therapy is an option. (Level of Evidence: C)

• Alcohol septal ablation should not be done in patients with HCM with concomitant disease that independently warrants surgical correction (e.g., coronary artery bypass grafting for CAD, mitral valve repair for ruptured chordae) in whom surgical myectomy can be performed as part of the operation. (Level of Evidence: C)

• Alcohol septal ablation should not be done in patients with HCM who are less than 21 years of age and is discouraged in adults less than 40 years of age if myectomy is a viable option. (Level of Evidence: C)

Use Outside the U.S.
National Institute for Health and Clinical Excellence (NICE) (United Kingdom)
NICE guidance published in 2004 states that the current evidence on the safety and efficacy of nonsurgical reduction of the myocardial septum appears adequate to support the use of this procedure. NICE recommended
the procedure only be performed in specialty units by clinicians who have had adequate training in the technique.

Summary
Surgical septal myectomy is established as the preferred treatment in most patients for reversing the consequences of heart failure resulting from hypertrophic cardiomyopathy refractory to pharmacological therapy, based on extensive experience, documented long-term results, and safety data. Percutaneous alcohol septal ablation was developed as a less invasive alternative to surgical septal myectomy. Although the procedure has not been evaluated in randomized controlled trials, the available evidence indicates that the procedure results in improvement in symptoms, usually reaching levels comparable to surgical myectomy. However, unlike the immediate clinical and hemodynamic improvement seen with surgical myectomy, improvement following alcohol septal ablation may occur over the course of several months. Alcohol septal ablation has also been associated with an increased risk of complete heart block requiring implantation of a permanent pacemaker, as well as an increased risk of sustained ventricular arrhythmias. Therefore, based on the available evidence and relevant specialty society guidelines, percutaneous alcohol septal ablation may be a reasonable treatment option for carefully selected adults with hypertrophic cardiomyopathy with left ventricular outflow tract (LVOT) obstruction and severe drug-refractory symptoms when surgical septal myectomy is contraindicated or the surgical risk is considered unacceptable due to one or more comorbidities or advanced age.

Appendix I

New York Heart Association Classification of Heart Failure

<table>
<thead>
<tr>
<th>Class</th>
<th>Patient Symptoms</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>Ordinary physical activity does not cause undue fatigue, dyspnea, palpitation</td>
<td>None</td>
</tr>
<tr>
<td>Class II</td>
<td>Ordinary physical activity causes fatigue, dyspnea, palpitation, or angina</td>
<td>Slight</td>
</tr>
<tr>
<td>Class III</td>
<td>Comfortable at rest; less than ordinary physical activity causes fatigue, dyspnea, palpitation, or angina</td>
<td>Moderate</td>
</tr>
<tr>
<td>Class IV</td>
<td>Symptoms at rest; any physical activity increases discomfort</td>
<td>Severe</td>
</tr>
</tbody>
</table>

Coding/Billing Information

Note: 1) This list of codes may not be all-inclusive.
   2) Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement

Covered when medically necessary when used to report percutaneous alcohol septal ablation (ASA)

<table>
<thead>
<tr>
<th>CPT®® Codes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>93583</td>
<td>Percutaneous transcatheter septal reduction therapy (e.g., alcohol septal ablation) including temporary pacemaker insertion when performed (Code effective 01/01/2014)</td>
</tr>
<tr>
<td>93799†</td>
<td>Unlisted cardiovascular service or procedure</td>
</tr>
</tbody>
</table>

References


