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Clinical UM Guideline

Subject:	**Alcohol Septal Ablation for Treatment of Hypertrophic Cardiomyopathy**		
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Description

This document addresses alcohol septal ablation (ASA), a less invasive alternative to open surgical septal resection, for the treatment of hypertrophic cardiomyopathy (HCM) in adults. HCM is also referred to as hypertrophic obstructive cardiomyopathy (HOCM).

Clinical Indications

Medically Necessary:

Alcohol septal ablation is considered medically necessary as a treatment of hypertrophic cardiomyopathy (HCM) in adults (age 21 and older) when all of the following criteria are met:

- **Severe heart failure symptoms (New York Heart Association [NYHA] class III or IV) or other exertional symptoms (such as syncope or near syncope) refractory to drug therapy; and**
- **Left ventricular outflow tract (LVOT) gradient greater than or equal to 50 mm Hg at rest or with physiological provocation, including but not limited to: exercise, Valsalva maneuver or amyl nitrate.**

~~Investigational and~~ **Not Medically Necessary:**

Alcohol septal ablation is considered ~~investigational and~~ not medically necessary when all of the above criteria are not met.

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~~Federal and State law, as well as contract language, and Medical Policy take precedence over Clinical UM Guidelines. We reserve the right to review and update Clinical UM Guidelines periodically. Clinical guidelines approved by the Medical Policy & Technology Assessment Committee are available for general adoption by plans or lines of business for consistent review of the medical necessity of services related to the clinical guideline when the plan performs utilization review for the subject. Due to variances in utilization patterns, each plan may choose whether to implement a particular Clinical UM Guideline. To determine if review is required for this Clinical UM Guideline, please contact the customer service number on the member's card.~~

~~Alternatively, commercial or FEP plans or lines of business which determine there is not a need to adopt the guideline to review services generally across all providers delivering services to Plan's or line of business's members may instead use the clinical guideline for provider education and/or to review the medical necessity of services for any provider who has been notified that his/her/its claims will be reviewed for medical necessity due to billing practices or claims that are not consistent with other providers, in terms of frequency or in some other manner.~~

Coding

The following codes for treatments and procedures applicable to this guideline are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

~~**When services may be Medically Necessary when criteria are met:**~~

CPT	
93583	**Percutaneous transcatheter septal reduction therapy (eg alcohol septal ablation), including temporary pacemaker insertion when performed**
ICD-10 Procedure	
025M3ZZ	**Destruction of ventricular septum, percutaneous approach [when specified as alcohol septal ablation]**
ICD-10 Diagnosis	
I42.1-I42.2	**Hypertrophic cardiomyopathy**

~~**When services are Investigational and Not Medically Necessary:**~~
~~**For the procedure codes listed above when criteria are not met or when the code describes a procedure indicated in the Position Statement section as investigational and not medically necessary.**~~

Discussion/General Information

HCM is an inherited cardiovascular disease present in 1 in 500 of the general population (Maron, 2013) and is the most common genetic cardiac disease (Khouzam, 2014). One of the most characteristic abnormalities of this complex disease is a hypertrophied and nondilated left ventricle, which may impair diastolic filling. When the hypertrophy results in left ventricular outflow obstruction, the development of dyspnea, angina,

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syncope, or congestive heart failure may occur. Pharmacologic therapies include beta blockers or calcium-channel blockers to decrease the heart rate with a consequent prolongation in diastole and increased passive ventricular filling. If medical therapy is insufficient to control symptoms, strategies to reduce the outflow obstruction may be considered. Surgical resection focuses on removing a small amount of myocardium at the base of the septum (myotomy-myomectomy).

Alcohol septal ablation for treatment of HCM has been considered as an alternative to open surgical septal resection in adults. The technique involves infusion of ethanol through an angioplasty catheter threaded into the septal perforator branches of the left anterior descending artery intended to infarct and subsequently thin the bulging septum. A key component of the procedure is the identification of the target vessels. A balloon catheter is introduced into the septal branches. The balloon is inflated and contrast injected into the balloon lumen to delineate the area supplied by the septal branch and to ensure that the balloon inflation would prevent spillage of the subsequent injection of alcohol into the left anterior descending artery.

Clinical evidence evaluating alcohol septal ablation indicates that in certain adults, the procedure may result in improvement of various signs and symptoms including NYHA classification, exercise time, LVOT gradient, and septal thickness as measured by echocardiography. There is a lack of randomized trials evaluating the procedure; however, case series, meta-analyses and practice guidelines are available.

In an early case series, Seggewiss and colleagues (1999) reported on 114 individuals with symptomatic HCM who underwent treatment with alcohol septal ablation. LVOT gradient was reduced in 94% of subjects from a mean of 73.8 mm Hg to 18.6 mm Hg with the gradient further declining at the 3-month follow-up. The NYHA classification also improved. A total of 11 (9.6%) individuals required a permanent pacemaker due to trifascicular block and 2 individuals (1.8%) died during the hospital stay. Kuhn and colleagues (2000) reported on a case series of 215 alcohol septal ablation procedures in 187 individuals. The perioperative mortality rate was 2.3%. At a mean follow-up of 2.4 years, the NYHA classification had decreased from 3.0 to 1.6. Similar to the data reported by Seggewiss, there were significant improvements in cardiodynamic measures, including outflow gradient and septal thickness. Gietzen and colleagues (1999) reported on 62 individuals with HCM undergoing alcohol septal ablation, all of whom had substantial clinical improvement. The procedure-related early mortality was 4%, and a permanent pacemaker was required in 40% of the

cases. Lakkis and colleagues (2000) reported on the 1 year follow-up of 50 individuals with HCM undergoing alcohol septal ablation. A total of 16% required permanent pacemaker implantation. There were 2 perioperative deaths (4%). Prior to the procedure, all individuals reported either NYHA Class III or IV symptoms compared to none at 1 year follow-up. Improvement in cardiodynamic assessments was consistent with the clinical improvements.

Fernandes and colleagues (2008) evaluated long-term outcomes of alcohol septal ablation. A total of 629 subjects were enrolled consecutively from 1996 to 2007. Of the enrollees, 98.4% (n=619) underwent alcohol septal ablation with 92% follow-up in 2007. During the procedure, ethanol (2.6 ± 1.0 ml) was injected into 1.3 ± 0.5 septal arteries, inducing a septal infarct. Complications included death 1% (n=6), permanent pacemaker requirement 8.2% (n=52), coronary dissection 1.3% (n=8), and worsening mitral regurgitation 0.3% (n=2). The mean follow-up was 4.6 ± 2.5 years (range: 3 months to 10.2 years). During follow-up, NYHA functional class decreased from 2.8 ± 0.6 to 1.2 ± 0.5 (p<0.001); Canadian Cardiovascular Society angina score decreased from 2.1 ± 0.9 to 1.0 ± 0 (p<0.001); and exercise time increased from 4.8 ± 3.3 to 8.2 ± 1.0 (p<0.001) minutes. The resting and provoked LVOT gradients decreased progressively (p<0.001) and remained low during follow-up. The septal thickness decreased from 2.1 ± 0.5 cm to 1.0 ± 0.1 cm (p<0.001) and the ejection fraction decreased from 68 ± 9% to 62 ± 3 % (p<0.001). The survival estimates at 1, 5, and 8 years were 97%, 92%, and 89%, respectively. The initial benefits of alcohol septal ablation were maintained during follow-up.

Nageuh and colleagues (2011) reported predictors of clinical outcomes of alcohol septal ablation for the treatment of HOCM. A total of 874 individuals who underwent alcohol septal ablation were enrolled in a multicenter North American Registry. A majority of the subjects (64%) had severe obstruction at rest, and the remaining had provocable obstruction. Prior to ablation, it was noted that 78% of the subjects had severe dyspnea (NYHA functional class III or IV) and 43% had severe angina (Canadian Cardiovascular Society angina class III or IV) with or without dyspnea. Significant improvement occurred after ablation; however, there were 81 deaths (9.3%). Survival estimates at 1, 5, and 9 years were 97%, 86%, and 74%, respectively. Survival appeared better after alcohol septal ablation as compared to those who did not undergo septal reduction therapy. Variables which predicted mortality after ablation, included baseline

ejection fraction and NYHA functional class, the number of septal arteries injected with ethanol, post-ablation septal thickness, beta-blocker use, and the number of ablation procedures.

Multiple meta-analyses are also available in the published literature comparing outcomes of alcohol septal ablation with septal myectomy for treatment of HCM (Agarwal, 2009; Alam, 2009; Leonardi, 2010; Liebregts, 2015; Singh, 2016). Similar mortality rates and functional status were observed for both treatments in the meta-analyses, however; limitations of alcohol septal ablation reported included post-procedure conduction abnormalities and a higher post-intervention LVOT gradient.

Jensen and colleagues (2013) assessed survival, effects on traditional risk factors (RFs), and the incidence of sudden cardiac death (SCD) following treatment with alcohol septal ablation. In an observational dual-center cohort, 470 consecutive subjects (age 56 ± 14 years) with HCM (1996-2010) underwent clinically applied echo-contrast-guided alcohol septal ablation treatments. All-cause mortality, SCD and RFs for SCD before and after alcohol septal ablation were evaluated. The 10 year survival was 88% after alcohol septal ablation compared with 84% in a matched background population. The 10 year survival free of SCD was 95% (annual SCD rate 0.5%). Alcohol septal ablation reduced the prevalence of abnormal blood pressure response (from 23% to 9%, p<0.001), syncope (26% to 2%, p<0.001), non-sustained ventricular tachycardia (NSVT) (23% to 17%, p<0.05) and maximal wall thickness ≥ 30 mm (7% to 2%, p<0.001). The proportion of subjects at high risk having two or more RFs (n=89), was reduced from 25% to 8% (p<0.001). The authors concluded that the number of RFs, including the prevalence of NSVT, was markedly reduced by alcohol septal ablation and the incidence of SCD was correspondingly low.

ASA results in a transmural infarct occupying up to 10% of the ventricular myocardium and as a result LV systolic function could decrease over time (Moss, 2014). A long-term prospective nonrandomized follow-up study was performed by Moss and colleagues (2014) of 145 consecutive individuals with HCM that underwent 167 alcohol septal ablation procedures from 2002 to 2011. Prior to the procedure, all individuals had a normal baseline left ventricular ejection fraction (LVEF) of more than 55%. Echocardiographic follow-up was available in 139 (96%) of the cases. Of those with echocardiographic follow-up performed post alcohol septal ablation, LVEF was conserved in 97.1% of cases over a mean follow-up time of 3.1 ± 2.3 years. Mild LV systolic dysfunction was observed (LVEF range 44% to 54%) in only 4 cases. Mitral regurgitation

severity improved in 67%. Resting LVOT gradient declined from a mean of 75 to 19 mm Hg (p<0.001), and provoked gradient declined from a mean of 101 to 33 mm Hg (p<0.001). New York Heart Association class improved from a mean of 2.9 ± 0.4 to 1.3 ± 0.5 (p<0.001). Sixteen deaths (11%) occurred, at least 3 of which were most likely due to cardiovascular causes. Survival was estimated to be 96%, 90%, and 85% at 1, 3, and 5 years, respectively. Study limitations included lack of a control or comparison group. The authors concluded that their study suggests that "LV systolic function is preserved in most patients treated with ASA, and corresponding improvements in functional capacity and echocardiographic parameters were observed in the majority."

Veselka and colleagues (2014a) retrospectively evaluated 290 consecutive, highly symptomatic individuals aged 50 years or less with HOCM who underwent alcohol septal ablation at three European centers. Median duration of follow-up was 5.1 years (range, 0.1-15.4 years). The primary endpoint was all-cause mortality. Clinical, electrocardiographic, and echocardiographic exams were performed on all persons at 3-6 months post procedure and then yearly. During the study period, 4 persons (5%) died. Causes of death that were at least partially attributed to HCM (sudden death and stroke) occurred in 2 persons (3%). Sudden death occurred in 1 case (0.2% per year). Survival free of all-cause mortality combined with the first appropriate discharge at 1, 5, and 10 years was 96%, 91%, and 91%, respectively. The annual mortality, including the first appropriate discharge, was 1.43% (95% confidence interval [CI], 0.52-3.10%). A total of 85% reported improvement of dyspnea and 93% reported improvement of angina.

In a larger study, Veselka and colleagues (2014b) reported early outcomes of alcohol septal ablation performed at nine centers in six European countries for 459 persons (age 57 ± 13 years). Data was prospectively collected and retrospectively analyzed. Median duration of follow-up was 113 ± 40 days. The primary endpoint was decreased dyspnea. Clinical, electrocardiographic, and echocardiographic exams were performed on all persons at baseline and 3-6 months post procedure. The incidence of 3 month major adverse events (death, electrical cardioversion for tachyarrhythmias, resuscitation) and mortality was reported as 2.8% and 0.7%, respectively. Permanent pacemakers for post-ASA complete heart block were implanted in 43 persons (9%). Alcohol septal ablation was reported as having led to a significant reduction in LV outflow gradient, basal septum thickness, left atrium diameter, and mild dilation of the LV diameter.

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Significant improvements were seen in dyspnea, angina and syncope. Short-term follow-up demonstrated that 85% showed improved dyspnea and 93% reported improvement of symptoms.

Long-term outcomes of a large multinational ASA registry (Euro-ASA registry) were reported by Veselka and colleagues in 2016. A total of 1275 highly symptomatic individuals with HCM treated with ASA from January 1996 and February 2015 were included in the analysis. HCM was diagnosed by cardiologists experienced in managing the disease and ASA was performed by experienced interventional cardiologists. The volume of alcohol injected during ASA ranged from 0.4 to 11 ml, however, 90% of individuals were treated with a dose of 1-3 ml. There were some differences in post-procedural follow-up among participating centers but typically follow-up occurred at 3-6 months post ASA and then yearly. There were 13 deaths (1%) within the first month of ASA (4 cases of heart failure, 3 cases of pulmonary embolism, 2 cases of cardiac tamponade, and 1 case each of stroke, carcinoma and sudden cardiac death.) A total of 171 (13%) deaths occurred overall during follow-up. Median follow-up time of survival analysis was 5.7 years with 5 individuals (0.4%) lost to follow-up. Rates of survival at 1, 5 and 10 years post ASA were 98%, 89% and 77%, respectively. Independent predictors of all-cause mortality were higher age at ASA, septum thickness prior to ASA, NYHA class before ASA and LV outflow tract gradient at the last clinical check-up. Long-term survival in the current study was comparable with similar reports of treatment by myectomy. The authors concluded: "patients with obstructive HCM treated at tertiary centres have both low peri-procedural and long-term mortality after ASA."

It has been repeatedly demonstrated that certain individuals with highly symptomatic HCM may benefit from treatment with ASA. However, Veskelko and colleagues (2017) suggest that carefully selected individuals with mild HCM symptoms (NYHA class II) and severe LVOT obstruction may also benefit from treatment with ASA. The authors retrospectively evaluated 161 individuals from the Euro-ASA registry with NYHA class II dyspnea and LVOT 50 mm Hg or greater at rest or after provocation treated with ASA between January 1996 and May 2016. Some of the cases were included in previous reports. One individual died 2 days post-ASA of ventricular fibrillation. The 30-day mortality rate after ASA was 0.6% and the all-cause mortality rate was 1.7%. At the last clinical evaluation, a total of 141 (88%) individuals had resting left ventricular outflow track gradient of 30 mm Hg or less. Obstruction decreased from 63 ± 32 to 15 ± 19 mm Hg ($p<0.01$), and the mean NYHA class decreased from 2.0 ± 0 to 1.3 ± 0.1 ($p<0.01$). At the last clinical

evaluation, 69%, 29%, and 2% of individuals were in NYHA class I, II, and III, respectively. Study limitations included that only a relatively small number of mildly symptomatic individuals were analyzed and level of symptoms were self-reported.

In 2017, An and colleagues published a nonrandomized, observational study aimed to evaluate the long-term survival after ASA in subjects with HOCM (n=233) compared to non-obstructive hypertrophic cardiomyopathy (NOHCM) subjects (n=297). From 2000 to 2012, subjects with HOCM received ASA while NOHCM subjects were considered the control group. The evaluators found that "the 10- year overall survival was 94.6% in the ASA group, similar with 92.9% in the NOHCM group (p=0.930)" (An, 2017). From these results, the evaluators concluded that long-term survival after ASA is satisfactory. A limitation to the study was possible bias due to study design.

Batzner and colleagues (2018) reported on an observational, single-center analysis of survival after ASA in symptomatic individuals with HOCM. From May 2000 and June 2017, ASA was performed in 952 individuals with 6.0 ± 5.0 years clinical follow-up either through questionnaire or direct communication with the individual or the last treating physician. Batzner and colleagues (2018) found the following:

> **Estimated 5-year survival was 95.8%, estimated 5-year survival free of cardiovascular events was 98.6%, and an estimated 5-year survival free of cardiac events was 98.9%. Corresponding values at 10 years were 88.3%, 96.5%, and 97.0%, and at 15 years were 79.7%, 92.3%, and 96.5%.**

While this study had limitations including observational design which could have led to selection bias and lack of control group, the results showed long-term clinical utility of ASA with a large sample of symptomatic individuals with HOCM.

Other Considerations

Gersh and colleagues (2011) of the American College of Cardiology Foundation/American Heart Association Task Force on Practice guidelines issued a guideline for the diagnosis and treatment of HCM which includes the following invasive therapy recommendations:

CLASS I
1. Septal reduction therapy should be performed only by experienced operators in the context of a comprehensive HCM clinical program and only for the treatment of eligible patients with severe drug-refractory symptoms and LVOT obstruction.† (Level of Evidence: C)
***Experienced operators are defined as an individual operator with a cumulative case volume of at least 20 procedures or an individual operator who is working in a dedicated HCM program with a cumulative total of at least 50 procedures.**
†Eligible patients are defined by all of the following:
a. Clinical: Severe dyspnea or chest pain (usually NYHA functional classes III or IV) or occasionally other exertional symptoms (such as syncope or near syncope) that interfere with everyday activity or quality of life despite optimal medical therapy.
b. Hemodynamic: Dynamic LVOT gradient at rest or with physiologic provocation 50 mm Hg associated with septal hypertrophy and SAM of the mitral valve.
c. Anatomic: Targeted anterior septal thickness sufficient to perform the procedure safely and effectively in the judgment of the individual operator.

CLASS IIa
1. 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)
2. 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)
3. 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)
4. 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
1. 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)
2. 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
1. 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)
2. 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)
3. 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)
4. 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)
5. 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)

Levels of Evidence and Classification of Recommendations:

Levels of evidence:
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.

Classification of Recommendations:
CLASS I: Procedure/Treatment SHOULD be performed/administered.
CLASS IIa: Additional studies with focused objectives needed. IT IS REASONABLE to perform procedure/administer treatment.
CLASS IIb: Additional studies with broad objectives needed; additional registry data would be helpful. Procedure/Treatment MAY BE CONSIDERED.
CLASS III: No benefit or may cause harm.

In response to these guidelines, Liebregts and colleagues (2017) evaluated if ASA is safe and effective for younger individuals compared to older individuals through a multicenter observational cohort study. Individuals were divided into three groups: young (less than or equal to 50 years, n=369), middle-age (51-64 years, n=423), and older (greater than or equal to 65, n=405). The primary endpoints, all-cause mortality rates and adverse arrhythmic event rates, were similar in all groups at about 1% (p=0.90). The evaluators concluded that the guidelines should expand ASA indications to younger individuals.

In 2014, Elliott and colleagues of the European Society of Cardiology (ESC) issued a guideline on the diagnosis and management of hypertrophic cardiomyopathy. The following information for alcohol septal ablation is included:

In experienced centres, selective injection of alcohol into a septal perforator artery (or sometimes other branches of the left anterior descending coronary artery) to create a localized septal scar has outcomes similar to surgery in terms of gradient reduction, symptom

improvement and exercise capacity. The main non-fatal complication is AV block in 7–20% of patients and the procedural mortality is similar to isolated myectomy.

Due to the variability of the septal blood supply, myocardial contrast echocardiography is essential prior to alcohol injection. If the contrast agent cannot be localized exclusively to the basal septum at and adjacent to the point of mitral-septal contact, the procedure should be abandoned.

Injection of large volumes of alcohol in multiple septal branches—with the aim of gradient reduction in the catheter laboratory—is not recommended, as it is associated with a high risk of complications and arrhythmic events.

Conclusion

In summary, data suggests that alcohol septal ablation for the treatment of HCM is associated with symptomatic and cardiodynamic improvement in adults under specific circumstances. Risks associated with the procedure include complete heart block requiring implantation of a permanent pacemaker, as well as an increased risk of sustained ventricular arrhythmias. Alcohol septal ablation is not recommended in individuals under the age 21.

Definitions

Canadian Cardiovascular Society Score: This organization defines anginal classes as follows:

- **Class I - Ordinary physical activity does not cause angina;**
- **Class II - Slight limitation of ordinary activity;**
- **Class III - Marked limitation of ordinary physical activity;**
- **Class IV - Inability to carry on physical activity without discomfort.**

Left ventricular outflow tract (LVOT) gradient: A measurement often used to evaluate the severity of HCM, the presence or absence of LVOT obstruction, and the efficacy of treatment.

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New York Heart Association (NYHA) functional class: A four-tier system that categorizes based on subjective impression of the degree of functional compromise. The four NYHA functional classes are as follows:

- **Class I - Individuals with cardiac disease but without resulting limitation of physical activity; ordinary physical activity does not cause undue fatigue, palpitation, dyspnea, or anginal pain; symptoms only occur on severe exertion;**
- **Class II - Individuals with cardiac disease resulting in slight limitation of physical activity; they are comfortable at rest; ordinary physical activity, (e.g., moderate physical exertion, such as carrying shopping bags up several flights of stairs) results in fatigue, palpitation, dyspnea, or anginal pain;**
- **Class III - Individuals with cardiac disease resulting in marked limitation of physical activity; they are comfortable at rest; less than ordinary activity causes fatigue, palpitation, dyspnea or anginal pain;**
- **Class IV - Individuals with cardiac disease resulting in inability to carry on any physical activity without discomfort; symptoms of heart failure or the anginal syndrome may be present even at rest; if any physical activity is undertaken, discomfort is increased.**

Septal myectomy: A surgical procedure performed to reduce the muscle thickening that occurs in individuals with HCM.

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21. **Veselka J, Faber L, Liebregts M, et al. Outcome of alcohol septal ablation in mildly symptomatic patients with hypertrophic obstructive cardiomyopathy: a long-term follow-up study based on the Euro-Alcohol Septal Ablation Registry. J Am Heart Assoc. 2017; 6(5). e005735.**
22. **Veselka J, Jensen MK, Liebregts M, et al. Long-term clinical outcome after alcohol septal ablation for obstructive hypertrophic cardiomyopathy: results from the Euro-ASA registry. Eur Heart J. 2016; 37(19):1517-1523.**
23. **Veselka J, Krejčí J, Tomašov P, et al. Survival of patients ≤ 50 years of age after alcohol septal ablation for hypertrophic obstructive cardiomyopathy. Can J Cardiol. 2014a; 30(6):634-638.**
24. **Veselka J, Lawrenz T, Stellbrink C, et al. Early outcomes of alcohol septal ablation for hypertrophic obstructive cardiomyopathy: a European multicenter and multinational study. Catheter Cardiovasc Interv. 2014b; 84(1):101-117.**

Government Agency, Medical Society, and Other Authoritative Publications:

1. **Elliott PM, Anastasakis A, Borger MA, et al. 2014 ESC Guidelines on diagnosis and management of hypertrophic cardiomyopathy: the Task Force for the Diagnosis and Management of Hypertrophic Cardiomyopathy of the European Society of Cardiology (ESC). Eur Heart J. 2014; 35(39):2733-2779.**

This Clinical UM Guideline is intended to provide assistance in interpreting Healthy Blue's standard Medicaid benefit plan. When evaluating insurance coverage for the provision of medical care, federal, state and/or contractual requirements must be referenced, since these may limit or differ from the standard benefit plan. In the event of a conflict, the federal, state and/or contractual requirements for the applicable benefit plan coverage will govern. Healthy Blue reserves the right to modify its Policies and Guidelines as necessary and in accordance with legal and contractual requirements. This Clinical UM Guideline is provided for informational purposes. It does not constitute medical advice. Healthy Blue may also use tools and criteria developed by third parties, to assist us in administering health benefits. Healthy Blue's Policies and Guidelines are intended to be used in accordance with the independent professional medical judgment of a qualified health care provider and do not constitute the practice of medicine or medical advice.

2. **Gersh BJ, Maron BJ, Bonow RO, et al. American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. 2011 ACCF/AHA Guideline for the Diagnosis and Treatment of Hypertrophic Cardiomyopathy: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. Developed in collaboration with the American Association for Thoracic Surgery, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2011; 58(25):e212-260.**

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Non-surgical Septal Reduction
Percutaneous Transluminal Septal Ablation in Hypertrophic Obstructive Cardiomyopathy
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Transcoronary Ablation of Septal Hypertrophy (TASH)

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

History

Status	Date	Action
New	06/06/2019	Medical Policy & Technology Assessment Committee (MPTAC) review. Initial document development. Moved content of SURG.00133 Alcohol Septal Ablation for Treatment of Hypertrophic Cardiomyopathy to new clinical utilization management guideline document with the same title.

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