Clinical Policy Bulletin:
Thoracoscopic Sympathectomy

Number: 0310

Policy

*Please see amendment for Pennsylvania Medicaid at the end of this CPB.

I. Aetna considers thoracoscopic sympathectomy medically necessary for any of the following conditions:

A. Causalgia; or 
B. Catecholaminergic polymorphic ventricular tachycardia (CPVT), in persons who remain symptomatic despite maximal medical therapy; or 
C. Long QT syndrome, in persons who have failed medical therapy and have frequent shocks with an ICD despite medications; or 
D. Raynaud's disease; or 
E. Shoulder-hand syndrome; or 
F. Some types of visceral pain (e.g., chronic pancreatic pain and cancer-derived visceral abdominal pain); or 
G. Vascular occlusive disease; or 
H. Intractable, disabling axillary or palmar primary hyperhidrosis (excessive sweating) when all of the following are met (see also CPB 0504 - Hyperhidrosis)

- Iontophoresis or electrophoresis, (e.g., Drionic® device) is ineffective (see CPB 0229 - Iontophoresis) (a trial of botulinum toxin can be substituted for iontophoresis in persons with predominantly axillary hyperhidrosis -- see CPB 0113 - Botulinum Toxin); and 
- Significant disruption of professional and/or social life has occurred because of excessive sweating; and 
- Topical aluminum chloride or other extra-strength antiperspirants are ineffective or result in a severe rash; and 
- Unresponsive or unable to tolerate pharmacotherapy prescribed for excessive sweating (e.g., anti-cholinergics, beta-blockers, benzodiazapines) if sweating is episodic.

II. Aetna considers thoracoscopic sympathectomy cosmetic for excessive spontaneous facial blushing. Facial blushing (flushing) is considered a cosmetic indication as it does not result in functional impairment.

III. Aetna considers thoracoscopic sympathectomy experimental and investigational for all other indications (e.g., acne vulgaris, craniofacial or plantar hyperhidrosis) because its effectiveness for indications other than the ones listed above has not been established.
IV. Aetna considers left thoracoscopic sympathectomy experimental and investigational for cardiac denervation in persons with ventricular arrhythmias, and heart failure because the effectiveness of this approach for these indications has not been established.

See also CPB 0031 - Cosmetic Surgery.

Background

Sympathectomy is a surgical procedure that involves cauterizing (cutting and sealing) a portion of the sympathetic nerve chain that runs down the inside of the chest cavity. This operation permanently interrupts the nerve signal that is causing the body to sweat excessively and can be performed in either of the two sympathetic trunks. Each trunk is divided into three regions: cervical (neck), thoracic (chest) and lumbar (lower back). Sympathectomy is commonly targeted to the upper thoracic region.

Endoscopic thoracic sympathectomy (ETS) is performed by inserting a scope with a camera into the chest via a small incision under the axilla. The lung is temporarily collapsed so the surgeon can cut or otherwise destroy the nerve paths associated with the overactive sweat glands. The same procedure is repeated on the other side of the body. Side effects, especially compensatory hyperhidrosis in other parts of the body, may reduce long term satisfaction with this procedure. Sweating returns in approximately 50% of patients.

A report by the Finnish Office of Health Technology Assessment systematically evaluated the literature on the safety and effectiveness of thoracoscopic sympathectomy for treatment of sweating and for treatment of social phobia (Malmivaara et al, 2005). Thoracoscopic sympathectomy aims to reduce excessive sweating of the face and hands and facial flushing by interrupting stimulation of sweat glands by the sympathetic nervous system. The treatment is performed as an endoscopic procedure, where the upper thoracic chain of the sympathetic nerve trunk is transsected or clamped.

The authors stated that it is difficult to conduct even a qualitative synthesis of studies of thoracoscopic sympathectomy, due to poor reporting of patient characteristics and variation among studies in the reporting of outcomes (Malmivaara et al, 2005). In addition, the authors found most of the studies to be of poor methodologic quality. The authors stated, however, that available literature suggests that thoracoscopic sympathectomy reduces excessive sweating of the palms and facial flushing. Patient satisfaction was reported as good or moderately good. The authors identified only 1 study that followed subjects for more than 2 years.

The reported rates of acute post-operative complications following endoscopic thoracic sympathectomy varied widely among studies studies (Malmivaara et al, 2005). Acute post-operative complications, some severe, occurred in as many as 10% of subjects. The most commonly reported chronic complication was compensatory sweating below the breast level, often with substantial resultant disability. Other chronic complications included dryness of the face or palms and gustatory sweating. The authors noted that, due to wide variation in the reporting of complications, it is probable that these complications have been under-reported in most series.

The authors concluded that "due to lack of controlled trials there is no reliable evidence for the effectiveness of endoscopic thoracic sympathectomy for excessive sweating in the face and hands or for flushing of the face" (Malmivaara et al, 2005). The authors also found no reliable evidence of the effectiveness of endoscopic thoracoscopic sympathectomy for social phobia. The authors concluded that endoscopic thoracic sympathectomy is associated with significant immediate and long-term adverse effects.

A follow-up article to the FinOHTA assessment (Malmivaara et al, 2007) re-affirmed these earlier findings, concluding that: "The evidence for the effectiveness of ETS [endoscopic thoracic sympathectomy] is weak. The intervention is associated with severe immediate complications in
some patients and persistent adverse effects for many." The methodological quality and the reporting of clinically relevant characteristics were poor. The quality scores of the included studies ranged from 0 to 8; only 3 studies scored 6 or more. The authors stated that blushing and excessive sweating decreased after ETS in all studies, but no further details were reported. Complications following ETS included pneumothorax and/or haemothorax and Horner's syndrome in some patients in almost all studies. Compensatory excessive sweating was observed in 50 % or more of patients in 13 of the 15 studies, and was considered to cause significant disability in 3 to 15 % of those who experienced it.

A review by the Royal Australasian College of Surgeons (Watt et al, 2009) concluded that "[a] lack of high quality randomised trial evidence on ETS means that it is difficult to make a judgment on the safety and effectiveness of this technique", and that "[t]here is potentially a number of safety issues associated with this procedure."

Patients with palmar hyperhidrosis who fail topical therapies and iontophoresis, and who do not tolerate or get relief from botulinum toxin, can be treated effectively with endoscopic thoracic sympathectomy (Smith, 2008). Side effects, especially compensatory hyperhidrosis in other parts of the body, may reduce long-term patient satisfaction with this procedure. Endoscopic thoracic sympathectomy can also be used for axillary hyperhidrosis, but the relapse rate is high.

Hofferberth et al (2014) reported the outcomes of a single-institution experience using video-assisted thoracoscopic left cardiac sympathetic denervation as an adjunctive therapeutic technique in pediatric and young adult patients with life-threatening ventricular arrhythmias. These investigators conducted a retrospective clinical review of all patients who underwent left cardiac sympathetic denervation by means of video-assisted thoracoscopic surgery at the authors’ institution. From August 2000 to December 2011, a total of 24 patients (13 with long QT syndrome, 9 with catecholaminergic polymorphic ventricular tachycardia, and 2 with idiopathic ventricular tachycardia) were identified from the cardiology database and surgical records. There were no intra-operative complications. The median post-operative length of stay was 2 days (range of 1 to 32 days). There were no major peri-operative complications. Longer-term follow-up was available in 22 of 24 patients at a median follow-up of 28 months (range of 4 to 131 months). Sixteen (73 %) of the 22 patients experienced a marked reduction in their arrhythmia burden, with 12 (55 %) becoming completely arrhythmia-free after sympathectomy. Six (27 %) of the patients were non-responsive to treatment; each had persistent symptoms at follow-up. The authors concluded that video-assisted thoracoscopic left cardiac sympathetic denervation can be safely and effectively performed in most patients with life-threatening ventricular arrhythmias. They stated that this minimally invasive procedure is a promising adjunctive therapeutic option that achieves a beneficial response in most symptomatic patients. These preliminary findings need to be validated by well-designed studies.

De Ferrari and Schwartz (2014) stated that heart failure (HF) is characterized by an autonomic imbalance with withdrawal of vagal activity and increased sympathetic activity. Novel non-pharmacological approaches to HF aimed at increasing vagal activity are being proposed. Left cardiac sympathetic denervation (LCSD) has been shown to modify favorably the outcome of several disorders characterized by life-threatening arrhythmias triggered by increased sympathetic activity. These investigators discussed the rationale and the limited experimental and clinical experience suggesting a potential role for LCSD in the treatment of patients with advanced HF. Possible future clinical applications of LCSD may include HF patients who are intolerant to beta-adrenergic blockade, HF patients who have frequent implantable cardioverter-defibrillator shocks, and HF patients in countries where the likelihood of receiving a device is limited, but the capability to perform a one in a lifetime procedure is present.

An UpToDate review on “Management of refractory heart failure” (Colucci, 2015) does not mention thoracoscopic sympathectomy as a therapeutic option.

Costello et al (2015) stated that congenital ion channel disorders, including congenital long QT syndrome (LQTS), cause significant morbidity in pediatric patients. When medication therapy does not
control symptoms or arrhythmias, more invasive treatment strategies may be necessary. These researchers examined their institution's clinical experience with surgical cardiac denervation therapy for management of these arrhythmogenic disorders in children. An institutional review board-approved retrospective review identified 10 pediatric patients with congenital ion channelopathies who underwent surgical cardiac denervation therapy at a single institution between May 2011 and April 2014; 8 patients had a diagnosis of congenital LQTS, 2 patients were diagnosed with catecholaminergic polymorphic ventricular tachycardia (CPVT). All patients underwent sympathectomy and partial stellate ganglionectomy via video-assisted thoracoscopic surgery (VATS). Six of the 10 patients had documented ventricular arrhythmias pre-operatively, and 70% of the patients had pre-operative syncope. The corrected QT interval decreased in 75% of patients with LQTS following sympathectomy. Post-operative arrhythmogenic symptoms were absent in 88% of congenital LQTS patients, but both patients with CPVT continued to have symptoms throughout the duration of follow-up. All patients were alive after a median follow-up period of 10 months. The authors concluded that surgical cardiac denervation therapy via VATS is a useful treatment strategy for congenital LQTS patients who failed medical management, and its potential benefit in the management of CPVT is unclear. They stated that a prospective comparison of the effectiveness of surgical cardiac denervation therapy and implantable cardioverter-defibrillator use in congenital ion channelopathies is timely and crucial.

Thoracoscopic Sympathectomy for the Treatment of Acne Vulgaris:

Kaplan et al (2014) examined the therapeutic effect of thoracoscopic sympathicotomy performed at their clinic for facial/scalp hyperhidrosis or blushing on coincidental facial acne vulgaris based on previous reports indicating an association between the sympathetic nerve stimulus, epithelial melanocyte system and sebogenesis. The possible therapeutic effects of sympathicotomy on facial acne vulgaris were analyzed in a study design of retrospective review with prospective collection of the data from March 2005 to March 2013. A total of 42 patients were operated on at the authors’ clinic due to facial/scalp hyperhidrosis or blushing and 30 of these also had facial acne vulgaris. However, none harbored a systemic co-morbidity. Patients’ medical history indicated that they had used several medical therapies including topical or systemic anti-biotherapies to treat their acne for several years but this had met with limited success and the treatment was stopped in all patients an average of 8 ± 2.4 months prior to the operations. Furthermore, the patients with acne vulgaris also underwent a thoracoscopic sympathicotomy procedure at the second costal head (R2) for hyperhidrosis or blushing. All 30 patients showed marked improvement of their acne grade at the 1st post-operative month (p < 0.01). The authors concluded that in this study, the patients’ facial acne vulgaris grade significantly improved after undergoing a sympathicotomy. This can be explained by the possible effect the nervous system had on the epithelial melanocyte system and sebogenesis. However, these researchers stated that prospective studies with an increased number of patients are needed to verify these findings.

Furthermore, an UpToDate review on “Treatment of acne vulgaris” (Graber, 2016) does not mention thoracoscopic sympathectomy as a therapeutic option.

Trans-Umbilical Thoracic Sympathectomy for the Treatment of Palmar Hyperhidrosis:

Zhu et al (2016) noted that thoracic sympathectomy is considered as the most effective method to treat palmar hyperhidrosis (PH). These investigators reported their experience of trans-umbilical thoracic sympathectomy with an ultra-thin flexible endoscope for PH in a series of 148 patients with up to 4 years of follow-up. A prospective database was used in this retrospective analysis of 148 patients (61 males, 87 females, with a mean age of 21.3 years) with PH who were operated on by the same surgeon in a single institution from April 2010 to March 2014. All procedures were performed under general anesthesia involving intubation with a double-lumen endotracheal tube. Demographic, post-operative and long-term data of patients were recorded and statistical analyses were performed. All patients were followed-up at least 6 months post-procedure through clinic visits or telephone/e-mail interviews. The procedure was performed successfully in 148 of the 150 patients; 2 patients had to be
converted to conventional thoracoscopic procedure because of severe pleural adhesions. The mean operating time was 43 minutes (ranging from 39 to 107) and the mean post-operative length of stay was 1 day (range of 1 to 4). All patients were interviewed 6 to 48 months after surgery and no diaphragmatic hernia or syndrome was observed. The rate of resolution of PH and axillary hyperhidrosis was 98 and 74.6 %, respectively. Compensatory sweating was reported in 22.3 % of patients. Almost all of the patients were satisfied with the surgical results and the cosmetic outcome of the incision. The authors concluded that these preliminary findings suggested that trans-umbilical thoracic sympathectomy was a safe and effective alternative to the conventional approach. This technique avoided the chronic pain and chest wall paresthesia that are associated with the chest incision. In addition, this novel procedure afforded maximum cosmetic benefits. The main drawbacks of this study were: (i) the lack of a comparison group, and (ii) it was a single-center study and the procedure was performed by a single surgeon.

### CPT Codes / HCPCS Codes / ICD-10 Codes

*Information in the [brackets] below has been added for clarification purposes. Codes requiring a 7th character are represented by "+":*

#### CPT codes covered if selection criteria are met:

- **32664** Thoracoscopy, surgical; with thoracic sympathectomy

#### Other CPT codes related to the CPB:

- **64650** Chemodenervation of eccrine glands; both axillae
- **64804** Sympathectomy, cervicothoracic
- **97033** Application of a modality to one or more areas; iontophoresis, each 15 minutes

#### Other HCPCS codes related to the CPB:

- **J0585** Botulinum toxin type A, per unit
- **J0587** Botulinum toxin type B, per 100 units

#### ICD-10 codes covered if selection criteria are met:

- **G56.40** - **G56.43** Causalgia of upper limb
- **G57.70** - **G57.73** Causalgia of lower limb
- **I45.81** Long QT syndrome [in persons who have failed medical therapy and have frequency ICD shocks despite medications]
- **I47.2** Ventricular tachycardia [catecholaminergic polymorphic, in persons who remain symptomatic despite maximal medical therapy]
- **I73.00** - **I73.01** Raynaud's syndrome
- **L74.510, L74.512, L74.519** - **L74.52** Primary and secondary focal hyperhidrosis [intractable, disabling]

#### ICD-10 codes not covered for indications listed in the CPB:

- **I49.01** - **I49.02** Ventricular fibrillation and flutter

- **I47.2** Ventricular tachycardia
The above policy is based on the following references:

17. Fox AD, Hands L, Collin J. The results of thoracoscopic sympathetic trunk transection for palmar hyperhidrosis and sympathetic ganglionectomy for axillary hyperhidrosis. Eur J Vasc...
AETNA BETTER HEALTH® OF PENNSYLVANIA

Amendment to
Aetna Clinical Policy Bulletin Number: 0310 Thoracoscopic Sympathectomy

There are no amendments for Medicaid.