

Endoscopic thoracic sympathectomy for primary facial blushing

HealthTech guidance
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Your responsibility

This guidance represents the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, healthcare professionals are expected to take this guidance fully into account, and specifically any special arrangements relating to the introduction of new interventional procedures. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Commissioners and/or providers have a responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity, and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties. Providers should ensure that governance structures are in place to review, authorise and monitor the introduction of new devices and procedures.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

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This guidance replaces IPG480.

1 Recommendations

- 1.1 Current evidence on the efficacy and safety of endoscopic thoracic sympathectomy (ETS) for primary facial blushing is adequate to support the use of this procedure with normal arrangements for clinical governance, consent and audit.
- 1.2 Clinicians wishing to undertake ETS for primary facial blushing should ensure that patients understand the risks of the procedure. In particular they should explain that:
 - there is a risk of serious complications
 - hyperhidrosis is usual after the procedure: this can be severe and distressing and some patients regret having had the procedure (especially because of subsequent and persistent hyperhidrosis)
 - the procedure sometimes does not reduce facial blushing.Clinicians should also provide patients considering the procedure with clear written information.
- 1.3 In view of the risk of side effects this procedure should only be considered in patients suffering from severe and debilitating primary facial blushing that has been refractory to other treatments.
- 1.4 This procedure should only be undertaken by clinicians trained and experienced in thoracic endoscopy, and there should be the capacity to deal with intraoperative complications.
- 1.5 Further research into ETS for primary facial blushing should include clear information on patient selection and should seek to identify which patient characteristics might predict severe side effects. All complications should be reported. Outcomes should include measurements of efficacy, including quality of

life and social functioning both in the short and long term, and in particular the frequency and severity of compensatory hyperhidrosis.

2 Indications and current treatments

- 2.1 Blushing or facial reddening is an involuntary reaction, usually as a result of a strong emotional response that stimulates the sympathetic nervous system to increase the flow of blood to the skin of the face. People with facial blushing may also have hyperhidrosis (excessive sweating).
- 2.2 Conservative treatment for facial blushing includes oral medications such as beta-blockers or anticholinergics. When anxiety is the cause of blushing, psychological treatments such as cognitive behavioural therapy may be used.
- 2.3 If blushing fails to respond to conservative medical treatment or behavioural therapy, then surgical sympathectomy is an option: this can be done either by open or endoscopic approaches. Endoscopic sympathectomy is now usually the preferred technique because it is associated with less pain, improved cosmesis and more rapid recovery than open sympathectomy.

3 The procedure

- 3.1 The aim of endoscopic thoracic sympathectomy (ETS) for primary facial blushing is to reduce the frequency and duration of blushing by dividing the sympathetic nerves that lie along the sympathetic chain beside the vertebral column.
- 3.2 ETS is usually done with the patient under general anaesthesia. Small incisions are made in the axilla and an endoscope is inserted. The lung is partially collapsed. The sympathetic chain is visualised and the chosen part of the chain is divided by electrocautery or endoscopic scissors, or surgical clips may be applied. The extent of division varies but usually involves the part of the sympathetic chain over the second or third ribs, or both. Gas is removed from the pleural space, allowing the lung to re-expand, and the wounds are closed. The procedure is then usually repeated on the other side.

4 Efficacy

This section describes efficacy outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [overview](#).

- 4.1 In a case series of 831 patients with facial blushing who had endoscopic thoracic sympathectomy (ETS), mean symptom improvement score (assessed on a visual analogue scale; scores from 0 to 10, with 10 indicating worst possible symptoms) decreased from 9 before the procedure to 3 after the procedure in patients with facial blushing at a mean follow-up of 29 months; this difference was significant ($p<0.0001$).
- 4.2 A case series of 80 patients (12 patients with isolated facial blushing) reported complete resolution in 33% (4 out of 12) of patients with isolated facial blushing at a mean follow-up of 20 months.
- 4.3 A case series of 180 patients with isolated facial blushing reported symptom recurrence (1 month to 1 year after the procedure) in 2% (4 out of 173) of patients; all patients subsequently underwent reoperation with 'good results'.
- 4.4 In the case series of 80 patients (59 patients with facial blushing, isolated or in association with hyperhidrosis), quality of life (assessed on a 5-point Likert scale) was reported to be 'much better' in 63% (37 out of 59) of patients, and there was 'some improvement' in 15% (9 out of 59) of patients and 'no change' in 8% (5 out of 59) of patients.
- 4.5 A case series of 1,700 patients (648 patients with blushing or blushing with hyperhidrosis) reported satisfaction rates of 74% in patients with facial blushing ($n=536$) at a mean follow-up of 15 years (absolute number not reported). In a case series of 1,152 patients, 85% of the 244 patients with facial blushing reported being 'totally satisfied' at a mean follow-up of 8 months (absolute number not reported).
- 4.6 The specialist advisers stated that key efficacy outcomes were symptom improvement, absence of symptoms and the patient's perception of improvement

of symptoms.

5 Safety

This section describes safety outcomes from the published literature that the Committee considered as part of the evidence about this procedure. For more detailed information on the evidence, see the [overview](#).

5.1 A non-systematic review article reported that 5 patients died because of major intrathoracic bleeding after endoscopic thoracic sympathectomy (ETS) but the total number of patients treated by the procedure was not documented: in 2 patients a trocar lacerated the subclavian artery; in 1 patient an intercostal vein was damaged; the causes in the other 2 patients were not described.

5.2 An additional 4 deaths after ETS were reported in the non-systematic review article: 3 were due to problems related to anaesthetic technique, and 1 patient had an unexplained cerebral event 'some hours' after ETS. The total number of patients treated by the procedure was not documented.

5.3 Compensatory hyperhidrosis occurring mainly at the axillae, trunk and groin (assessed using Hyperhidrosis Disease Severity Scale; scores range from 1 to 4, with higher score indicating intolerable sweating interfering with daily activities) was reported to be 'intolerable' in 4% (n=1) of patients, 'hardly tolerable' in 21% (n=5) of patients, and 'tolerable' in 54% (n=13) of patients with facial blushing in a case series of 73 patients (denominator unclear). Half of the patients had compensatory hyperhidrosis within 1 month of the procedure. Severe compensatory hyperhidrosis on the trunk and regret associated with having had the procedure was reported in 6% of patients in the case series of 831 patients at a mean follow-up of 29 months (absolute number not reported). Compensatory hyperhidrosis that was considered 'incapacitating' and regret associated with having had the procedure was reported in 11% (190 out of 1,700) of patients with facial blushing or hyperhidrosis at a mean follow-up of 15 years.

5.4 Horner's syndrome on one side of the face was reported in 10% (2 out of 21) of patients with facial blushing in a case series of 202 patients (1 patient underwent blepharoplasty; no further details) and in 1 patient in the case series of 180 patients with isolated facial blushing: this resolved after 2 days.

5.5 Pneumothorax (needing a chest tube) was reported in 1 patient in the case series of 180 patients with isolated facial blushing. A chest drain was needed postoperatively (no further details provided) in 9% (5 out of 59) of patients with facial blushing in the case series of 80 patients.

5.6 Worsening of symptoms was reported in 1 patient and worsening of quality of life was reported in 14% (8 out of 59) of patients with isolated facial blushing or blushing with hyperhidrosis (n=59) in the case series of 80 patients.

5.7 In the case series of 1,152 patients (244 patients with facial blushing), 13% of patients were 'dissatisfied to some extent' and 2% regretted the operation at a mean follow-up of 8 months (absolute numbers not reported). A randomised controlled trial (comparing sympathectomy of the second versus the second and third thoracic ganglia) of 100 patients with isolated facial blushing reported that overall 13% (12 out of 93) of patients regretted the operation (reasons not reported) at a mean follow-up of 12 months; there was no significant difference between the groups treated by different extents of sympathectomy.

5.8 Additional safety events reported in a series of endoscopic thoracic sympathectomies done for a variety of indications were bleeding, haemothorax, chylothorax, pulmonary embolus and brachial plexus damage; it is unclear if these events were in patients with facial blushing.

5.9 The specialist advisers listed harlequin face, post-thoracoscopy chronic pain, and wound infection as adverse events reported in the literature. They listed anecdotal adverse events as air embolism and arm ischaemia. Theoretical adverse events were reported as death, dry hands and visceral injury.

6 Committee comments

6.1 The Committee noted that techniques of endoscopic thoracic sympathectomy vary in the way in which the sympathetic chain is dealt with and the precise extent of sympathectomy for primary facial blushing. These variations may affect the efficacy and safety outcomes of this procedure.

6.2 The Committee received and considered comments from patients, some of whom described severe distress as a result of side effects following this procedure.

Update information

Minor changes after publication

January 2026: Interventional procedures guidance 480 has been migrated to HealthTech guidance 331. The recommendations and accompanying content remain unchanged.

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Endorsing organisation

This guidance has been endorsed by Healthcare Improvement Scotland.