

# Thoracoscopic exclusion of the left atrial appendage (with or without surgical ablation) for non-valvular atrial fibrillation for the prevention of thromboembolism

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**NICE interventional procedure guidance 400**  
[guidance.nice.org.uk/ipg400](http://guidance.nice.org.uk/ipg400)



NHS Evidence has accredited the process used by the NICE Interventional Procedures Programme to produce interventional procedures guidance. Accreditation is valid for 5 years from January 2010 and applies to guidance produced since January 2009 using the processes described in the 'Interventional Procedures Programme: Process guide, January 2009' and the 'Interventional Procedures Programme: Methods guide, June 2007'



## 1 Guidance

- 1.1 Current evidence on the safety and efficacy of thoracoscopic exclusion of the left atrial appendage (LAA) for non-valvular atrial fibrillation (AF) for the prevention of thromboembolism as an adjunctive procedure to surgical ablative techniques is inadequate in quantity and quality. Therefore this procedure should only be used as an adjunct to surgical ablation with special arrangements for clinical governance, consent and audit or research.
- 1.2 Clinicians wishing to undertake thoracoscopic exclusion of the LAA for non-valvular AF for the prevention of thromboembolism as an adjunct to surgical ablation should take the following actions.
- Inform the clinical governance leads in their Trusts.
  - Ensure that patients and their carers understand the uncertainty about the procedure's safety and efficacy, and provide them with clear written information. In addition, the use of NICE's information for patients ('Understanding NICE guidance') is recommended (available from [www.nice.org.uk/guidance/IPG400/publicinfo](http://www.nice.org.uk/guidance/IPG400/publicinfo)).
  - Audit and review clinical outcomes of all patients having thoracoscopic exclusion of the LAA for non-valvular AF for the prevention of thromboembolism as an adjunctive procedure to ablative techniques (see section 3.1).
- 1.3 Current evidence on the safety and efficacy of thoracoscopic exclusion of the LAA for non-valvular AF for the prevention of thromboembolism when used in isolation is inadequate. Therefore this procedure should only be used in the context of research. Research studies should clearly define patient selection. They should report the cardiac rhythm achieved after surgery and also adverse events, particularly stroke and death, in both the short and longer term.
- 1.4 Patient selection should be carried out by a multidisciplinary team including a cardiac surgeon and other clinicians experienced in the management of patients with AF who are at risk of stroke. Patients should be considered for alternative treatments to reduce the risk of thromboembolism associated with AF, and should be informed about these alternatives.

- 1.5 This procedure should be carried out only by cardiac surgeons with experience in thoracoscopic surgery and specific training in the procedure.

## 2 The procedure

### 2.1 Indications and current treatments

- 2.1.1 Atrial fibrillation is the irregular and rapid beating of the atria. Patients with AF may be asymptomatic or may have symptoms such as fatigue, palpitations and chest pain. They also have an increased risk of thromboembolic stroke. In non-valvular AF, thrombi largely develop in the LAA.
- 2.1.2 Patients with AF who are considered to be at high risk of thromboembolic stroke are usually treated with anticoagulation therapy. If a patient is unable to tolerate anticoagulation, then surgical obliteration of the LAA through a percutaneous or open approach may be offered.

### 2.2 Outline of the procedure

- 2.2.1 Thoracoscopic exclusion of the LAA for non-valvular AF for the prevention of thromboembolism is usually carried out with the patient under general anaesthesia, and often alongside other procedures such as radiofrequency or microwave ablation to treat AF. Under thoracoscopic guidance the pericardium is opened and the atrial appendage excluded, usually using staples. A chest drain may be used to allow lung re-expansion. Postoperative transoesophageal echocardiography may be used to confirm exclusion of the LAA.

Sections 2.3 and 2.4 describe efficacy and 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, available at [www.nice.org.uk/guidance/IP/857/overview](http://www.nice.org.uk/guidance/IP/857/overview)

## 2.3 Efficacy

- 2.3.1 A case series of 100 patients treated by thoracoscopic LAA exclusion (n = 85) and epicardial radiofrequency ablation reported cerebrovascular accidents in 2% (2/88) of patients followed up and transient ischaemic attack (TIA) in 2% (2/88) of patients over a mean follow-up of 23 months.
- 2.3.2 A case series of 15 patients treated by the procedure alone reported an overall stroke rate of 4% per patient-year (95% confidence interval 1.0 to 16) (mean follow-up 42 months). Of these, 1 patient had a fatal stroke 55 months after the procedure.
- 2.3.3 The Specialist Advisers listed key efficacy outcomes as total exclusion of the LAA with endothelialisation and a demonstrable absence of residual appendage on echocardiography, and prevention of sequelae of thrombus such as stroke or TIA.

## 2.4 Safety

- 2.4.1 Death was reported in 3% (3/100) of patients in the case series of 100 patients (not otherwise described).
- 2.4.2 Thoracotomy for postoperative bleeding from the LAA was reported in 1 patient in the case series of 15 patients. Intraoperative conversion to mini-thoracotomy to control bleeding was required in 3% (3/100) of patients in the case series of 100 patients.
- 2.4.3 Conversion to median sternotomy because of severe pleural adhesions was required in 1 patient in a case series of 30 patients; 7% (2/30) of patients required drainage of pneumothorax after removal of chest drains.
- 2.4.4 Prolonged postoperative air leak and chronic pleuritic pain were each reported in 1 patient in the case series of 15 patients.
- 2.4.5 Acute subendocardial infarction (recovery within 12 days) was reported in 1 patient in a case series of 81 patients.

- 2.4.6 The Specialist Advisers listed anecdotal adverse events as incomplete exclusion with residual appendage, and neuralgia from the thoracoscopic port sites.

## 2.5 Other comments

- 2.5.1 The Committee considered the prevention of stroke to be the most important efficacy outcome of this procedure. However, its evaluation is complicated by the concomitant use of procedures to ablate AF and the variable use of anticoagulants.
- 2.5.2 The Committee was advised that new devices are available for this procedure that avoid the use of staples.

## 3 Further information

- 3.1 This guidance requires that clinicians undertaking the procedure as an adjunct to ablative techniques make special arrangements for audit. NICE has identified relevant audit criteria and has developed an audit tool (which is for use at local discretion), available from [www.nice.org.uk/guidance/IPG400](http://www.nice.org.uk/guidance/IPG400)
- 3.2 For related NICE guidance see [www.nice.org.uk](http://www.nice.org.uk)

### Information for patients

NICE has produced information on this procedure for patients and carers ('Understanding NICE guidance'). It explains the nature of the procedure and the guidance issued by NICE, and has been written with patient consent in mind. See [www.nice.org.uk/guidance/IPG400/publicinfo](http://www.nice.org.uk/guidance/IPG400/publicinfo)