NICE National Institute for Health and Care Excellence

Royal College of Physicians

NICE guideline

# Atrial fibrillation: diagnosis and management

NICE guideline
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# Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

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.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

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.

# Contents

This guideline replaces CG180.

This guideline is the basis of QS93.

This guideline should be read in conjunction with TA275, TA249, TA355, TA256 and TA197.

# Overview

This guideline covers diagnosing and managing atrial fibrillation in adults. It includes guidance on providing the best care and treatment for people with atrial fibrillation, including assessing and managing risks of stroke and bleeding.

The recommendations in this guideline were developed before the COVID-19 pandemic.

See the MHRA advice on warfarin and other anticoagulants – monitoring of patients during the COVID-19 pandemic, which includes reports of supratherapeutic anticoagulation with warfarin.

## Who is it for?

- Healthcare professionals
- Commissioners and providers
- People with atrial fibrillation, their families and carers

# Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in NICE's information on making decisions about your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

## 1.1 Detection and diagnosis

1.1.1 Perform manual pulse palpation to assess for the presence of an irregular pulse if there is a suspicion of atrial fibrillation. This includes people presenting with any of the following:

- breathlessness
- palpitations
- syncope or dizziness
- chest discomfort
- stroke or transient ischaemic attack. **[2006]**

1.1.2 Perform a 12-lead electrocardiogram (ECG) to make a diagnosis of atrial fibrillation if an irregular pulse is detected in people with suspected atrial fibrillation with or without symptoms. **[2021]**

1.1.3 In people with suspected paroxysmal atrial fibrillation undetected by 12-lead ECG recording:

- use a 24-hour ambulatory ECG monitor if asymptomatic episodes are suspected or symptomatic episodes are less than 24 hours apart

- use an ambulatory ECG monitor, event recorder or other ECG technology for a period appropriate to detect atrial fibrillation if symptomatic episodes are more than 24 hours apart. **[2021]**

For a short explanation of why the committee made the 2021 recommendations and how they might affect practice, see the rationale and impact section on detection and diagnosis.

Full details of the evidence and the committee's discussion are in evidence review A: effectiveness of tests for detection and evidence review B: accuracy of tests for detection.

# 1.2 Assessment of stroke and bleeding risks

## Stroke risk

1.2.1 Use the $CHA_2DS_2$-VASc stroke risk score to assess stroke risk in people with any of the following:

- symptomatic or asymptomatic paroxysmal, persistent or permanent atrial fibrillation
- atrial flutter
- a continuing risk of arrhythmia recurrence after cardioversion back to sinus rhythm or catheter ablation. **[2021]**

  See the section on review of people with atrial fibrillation for advice on reassessment of stroke risk.

For a short explanation of why the committee made this recommendation and how it might affect practice, see the rationale and impact section on stroke risk.

Full details of the evidence and the committee's discussion are in evidence review C and D: tools to predict stroke in people with atrial fibrillation.

## Bleeding risk

1.2.2 Assess the risk of bleeding when:

- considering starting anticoagulation in people with atrial fibrillation **and**
- reviewing people already taking anticoagulation.

Use the ORBIT bleeding risk score because evidence shows that it has a higher accuracy in predicting absolute bleeding risk than other bleeding risk tools. Accurate knowledge of bleeding risk supports shared decision making and has practical benefits, for example, increasing patient confidence and willingness to accept treatment when risk is low and prompting discussion of risk reduction when risk is high. Although ORBIT is the best tool for this purpose, other bleeding risk tools may need to be used until it is embedded in clinical pathways and electronic systems. **[2021]**

1.2.3 Offer monitoring and support to modify risk factors for bleeding, including:

- uncontrolled hypertension (see NICE's guideline on hypertension in adults)
- poor control of international normalised ratio (INR) in patients on vitamin K antagonists
- concurrent medication, including antiplatelets, selective serotonin reuptake inhibitors (SSRIs) and non-steroidal anti-inflammatory drugs (NSAIDs)
- harmful alcohol consumption (see NICE's guideline on alcohol-use disorders: diagnosis, assessment and management of harmful drinking and alcohol dependence)
- reversible causes of anaemia. **[2021]**

## Discussing the results of the risk assessment

1.2.4 Discuss the results of the assessments of stroke and bleeding risk with the person taking into account their specific characteristics, for example comorbidities, and their individual preferences. For further guidance, see the section on enabling patients to actively participate in their care in

NICE's guideline on patient experience in adult NHS services. **[2021]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the rationale and impact section on bleeding risk.

Full details of the evidence and the committee's discussion are in evidence review E and F: risk stratification tools for predicting bleeding in people with atrial fibrillation.

## 1.3 Assessment of cardiac function

1.3.1 Perform transthoracic echocardiography (TTE) in people with atrial fibrillation:

- for whom a baseline echocardiogram is important for long-term management
- for whom a rhythm-control strategy that includes cardioversion (electrical or pharmacological) is being considered
- in whom there is a high risk or a suspicion of underlying structural or functional heart disease (such as heart failure or heart murmur) that influences their subsequent management (for example, choice of antiarrhythmic drug)
- in whom refinement of clinical risk stratification for antithrombotic therapy is needed (see section 1.2 on assessment of stroke and bleeding risks and section 1.6 on stroke prevention). **[2006, amended 2014]**

1.3.2 Do not routinely perform TTE solely for the purpose of further stroke risk stratification in people with atrial fibrillation for whom the need to start anticoagulation therapy has already been agreed on appropriate clinical criteria (see section 1.2 on assessment of stroke and bleeding risks and section 1.6 on stroke prevention). **[2006, amended 2014]**

1.3.3 Perform transoesophageal echocardiography (TOE) in people with atrial fibrillation:

- when TTE demonstrates an abnormality (such as valvular heart disease) that warrants further specific assessment

- in whom TTE is technically difficult and/or of questionable quality and when there is a need to exclude cardiac abnormalities
- for whom TOE-guided cardioversion is being considered. **[2006]**

# 1.4 Personalised package of care and information

1.4.1 Offer people with atrial fibrillation a personalised package of care. Ensure that the package of care is documented and delivered, and that it covers:

- stroke awareness and measures to prevent stroke
- rate control
- assessment of symptoms for rhythm control
- who to contact for advice if needed
- psychological support if needed
- up-to-date and comprehensive education and information on:
  - cause, effects and possible complications of atrial fibrillation
  - management of rate and rhythm control
  - anticoagulation
  - practical advice on anticoagulation in line with the recommendations on information and support for people having anticoagulation treatment in NICE's guideline on venous thromboembolic diseases
  - support networks (for example, cardiovascular charities). **[2014]**

1.4.2 Follow the recommendations in NICE's guideline on shared decision making. **[2014]**

## Medicines adherences and optimisation

1.4.3 To support adherence and ensure safe and effective medicines use in people with atrial fibrillation, follow the recommendations in NICE's guidelines on medicines adherence and medicines optimisation. **[2021]**

# 1.5 Referral for specialised management

1.5.1 Refer people promptly at any stage if treatment fails to control the symptoms of atrial fibrillation and more specialised management is needed. This should be within 4 weeks after the failed treatment or after recurrence of atrial fibrillation after cardioversion. **[2014]**

# 1.6 Stroke prevention

## Anticoagulation

1.6.1 When discussing the benefits and risks of anticoagulation use clinical risk profiles and personal preferences to guide treatment choices. Discuss with the person that:

- for most people the benefit of anticoagulation outweighs the bleeding risk
- for people with an increased risk of bleeding, the benefit of anticoagulation may not always outweigh the bleeding risk, and careful monitoring of bleeding risk is important. **[2021]**

1.6.2 When deciding between anticoagulation treatment options:

- Discuss the risks and benefits of different drugs with the person and follow the recommendations in NICE's guideline on shared decision making.
- Follow the recommendations on patient involvement in decisions about medicines in NICE's guideline on medicines adherence and patient decision aids in NICE's guideline on medicines optimisation.
- Take into account any contraindications for each drug and follow the guidance in the British National Formulary and the MHRA advice on direct-acting oral anticoagulants, in particular for advice on dosages in people with renal impairment, reversal agents and monitoring. **[2021]**

1.6.3 Offer anticoagulation with a direct-acting oral anticoagulant to people with atrial fibrillation and a $CHA_2DS_2$-VASc score of 2 or above, taking into account the risk of bleeding. Apixaban, dabigatran, edoxaban and rivaroxaban are recommended as options, when used in line with the

criteria specified in the relevant NICE technology appraisal guidance (see the section on direct-acting oral anticoagulant treatment options). **[2021]**

1.6.4 Consider anticoagulation with a direct-acting oral anticoagulant for men with atrial fibrillation and a $CHA_2DS_2$-VASc score of 1, taking into account the risk of bleeding. Apixaban, dabigatran, edoxaban and rivaroxaban are recommended as options, when used in line with the criteria specified in the relevant NICE technology appraisal guidance (see the section on direct-acting oral anticoagulant treatment options). **[2021]**

1.6.5 If direct-acting oral anticoagulants are contraindicated, not tolerated or not suitable in people with atrial fibrillation, offer a vitamin K antagonist. See the section on self-monitoring and self-management of vitamin K antagonists. **[2021]**

1.6.6 For adults with atrial fibrillation who are already taking a vitamin K antagonist and are stable, continue with their current medication and discuss the option of switching treatment at their next routine appointment, taking into account the person's time in therapeutic range. **[2021]**

1.6.7 Do not offer stroke prevention therapy with anticoagulation to people aged under 65 years with atrial fibrillation and no risk factors other than their sex (that is, very low risk of stroke equating to a $CHA_2DS_2$-VASc score of 0 for men or 1 for women). [**2021]**

1.6.8 Do not withhold anticoagulation solely because of a person's age or their risk of falls. **[2021]**

## Direct-acting oral anticoagulant treatment options

These options are listed in alphabetical order.

Find out why these recommendations look a little different from usual.

**TA275: Apixaban**

Apixaban is recommended as an option for preventing stroke and systemic embolism within its marketing authorisation, that is, in people with non-valvular atrial fibrillation with 1 or more risk factors such as:

- prior stroke or transient ischaemic attack
- age 75 years or older
- hypertension
- diabetes mellitus
- symptomatic heart failure.

Decide whether to start treatment with apixaban after an informed discussion with the person about its risks and benefits compared with warfarin, dabigatran etexilate, edoxaban and rivaroxaban. For people taking warfarin, consider the potential risks and benefits of switching to apixaban taking into account their level of international normalised ratio (INR) control.

To see why we made these recommendations, read the full technology appraisal guidance on apixaban for preventing stroke and systemic embolism in people with non-valvular atrial fibrillation.

**TA249: Dabigatran etexilate**

Dabigatran etexilate is recommended as an option for the prevention of stroke and systemic embolism within its licensed indication, that is, in people with nonvalvular atrial fibrillation with one or more of the following risk factors:

- previous stroke, transient ischaemic attack or systemic embolism
- left ventricular ejection fraction below 40%
- symptomatic heart failure of New York Heart Association (NYHA) class 2 or above
- age 75 years or older
- age 65 years or older with one of the following: diabetes mellitus, coronary artery disease or hypertension.

Decide whether to start treatment with dabigatran etexilate after an informed discussion with the person about its risks and benefits compared with warfarin, apixaban, edoxaban and rivaroxaban. For people taking warfarin, consider the potential risks and benefits of switching to dabigatran etexilate taking into account their level of international normalised ratio (INR) control.

To see why we made these recommendations, read the full technology appraisal guidance on dabigatran etexilate for the prevention of stroke and systemic embolism in atrial fibrillation.

**TA355: Edoxaban**

Edoxaban is recommended, within its marketing authorisation, as an option for preventing stroke and systemic embolism in adults with non-valvular atrial fibrillation with one or more risk factors, including:

- congestive heart failure
- hypertension
- diabetes
- prior stroke or transient ischaemic attack
- age 75 years or older.

Decide whether to start treatment with edoxaban after an informed discussion with the person about its risks and benefits compared with warfarin, apixaban, dabigatran etexilate and rivaroxaban. For people taking warfarin, consider the potential risks and benefits of switching to edoxaban taking into account their level of international normalised ratio (INR) control.

To see why we made these recommendations, read the full technology appraisal guidance on edoxaban for preventing stroke and systemic embolism in people with non-valvular atrial fibrillation.

**TA256: Rivaroxaban**

Rivaroxaban is recommended as an option for the prevention of stroke and systemic embolism within its licensed indication, that is, in people with non-valvular atrial fibrillation with one or more risk factors such as:

- congestive heart failure
- hypertension
- age 75 years or older
- diabetes mellitus
- prior stroke or transient ischaemic attack.

Decide whether to start treatment with rivaroxaban after an informed discussion with the person about its risks and benefits compared with warfarin, apixaban, dabigatran etexilate and edoxaban. For people taking warfarin, consider the potential risks and benefits of switching to rivaroxaban taking into account their level of international normalised ratio (INR) control.

To see why we made these recommendations, read the full technology appraisal guidance on rivaroxaban for the prevention of stroke and systemic embolism in people with atrial fibrillation.

For a short explanation of why the committee made these recommendations and how they might affect practice, see the rationale and impact section on stroke prevention.

Full details of the evidence and the committee's discussion are in evidence review G1: anticoagulant therapy for stroke prevention in people with atrial fibrillation and evidence review G2: anticoagulant therapy health economics analysis.

## Assessing anticoagulation control with vitamin K antagonists

1.6.9 Calculate the person's time in therapeutic range (TTR) at each visit. When calculating TTR:

- use a validated method of measurement such as the Rosendaal method for computer-assisted dosing or proportion of tests in range for manual dosing
- exclude measurements taken during the first 6 weeks of treatment
- calculate TTR over a maintenance period of at least 6 months. **[2014]**

1.6.10 Reassess anticoagulation for a person whose anticoagulation is poorly controlled shown by any of the following:

- 2 INR values higher than 5 or 1 INR value higher than 8 within the past 6 months
- 2 INR values less than 1.5 within the past 6 months
- TTR less than 65%. **[2014]**

1.6.11 When reassessing anticoagulation, take into account and if possible address the following factors that may contribute to poor anticoagulation control:

- cognitive function
- adherence to prescribed therapy
- illness
- interacting drug therapy
- lifestyle factors including diet and alcohol consumption. **[2014]**

1.6.12 If poor anticoagulation control cannot be improved, evaluate the risks and benefits of alternative stroke prevention strategies and discuss these with the person. **[2014]**

### Self-monitoring and self-management of vitamin K antagonists

NICE has developed diagnostics guidance on atrial fibrillation and heart valve disease: self-monitoring coagulation status using point-of-care coagulometers (the CoaguChek XS system).

## Antiplatelets

For guidance on antiplatelet therapy for people who have had a myocardial infarction and are having anticoagulation, see antiplatelet therapy for people with an ongoing separate indication for anticoagulation in NICE's guideline on acute coronary syndromes.

1.6.13 Do not offer aspirin monotherapy solely for stroke prevention to people with atrial fibrillation. **[2014]**

## Review of people with atrial fibrillation

1.6.14 For people who are not taking an anticoagulant, review stroke risk when they reach age 65 or if they develop any of the following at any age:

- diabetes
- heart failure
- peripheral arterial disease
- coronary heart disease
- stroke, transient ischaemic attack or systemic thromboembolism. **[2014]**

1.6.15 For people who are not taking an anticoagulant because of bleeding risk or other factors, review stroke and bleeding risks annually, and ensure that all reviews and decisions are documented. **[2014]**

1.6.16 For people who are taking an anticoagulant, review the need for anticoagulation and the quality of anticoagulation (taking into account MHRA advice on direct-acting oral anticoagulants about bleeding risk and the need to monitor renal function in patients with renal impairment) at least annually, or more frequently if clinically relevant events occur affecting anticoagulation or bleeding risk. **[2014]**

## Left atrial appendage occlusion

1.6.17 Consider left atrial appendage occlusion (LAAO) if anticoagulation is contraindicated or not tolerated and discuss the benefits and risks of LAAO with the person. For more information see NICE's interventional

procedure guidance on percutaneous occlusion of the left atrial appendage in non-valvular atrial fibrillation for the prevention of thromboembolism. **[2014]**

1.6.18 Do not offer LAAO as an alternative to anticoagulation unless anticoagulation is contraindicated or not tolerated. **[2014]**

# 1.7 Rate and rhythm control

This section covers rate and rhythm control in non-acute settings. See section 1.8 for rate and rhythm control for people presenting acutely (either new onset or destabilisation of existing atrial fibrillation).

## Rate control

1.7.1 Offer rate control as the first-line treatment strategy for atrial fibrillation except in people:

- whose atrial fibrillation has a reversible cause
- who have heart failure thought to be primarily caused by atrial fibrillation
- with new-onset atrial fibrillation
- with atrial flutter whose condition is considered suitable for an ablation strategy to restore sinus rhythm
- for whom a rhythm-control strategy would be more suitable based on clinical judgement. **[2014]**

1.7.2 Offer either a standard beta-blocker (that is, a beta-blocker other than sotalol) or a rate-limiting calcium-channel blocker (diltiazem or verapamil) as initial rate-control monotherapy to people with atrial fibrillation unless the person has the features described in recommendation 1.7.4. Base the choice of drug on the person's symptoms, heart rate, comorbidities and preferences. **[2021]**

In April 2021, this was an off-label use of diltiazem. See NICE's information on prescribing medicines.

1.7.3 For people with atrial fibrillation and concomitant heart failure, follow the recommendations on the use of beta-blockers and avoiding calcium-channel blockers in NICE's guideline on chronic heart failure. **[2021]**

1.7.4 Consider digoxin monotherapy for initial rate control for people with non-paroxysmal atrial fibrillation if:

- the person does no or very little physical exercise **or**
- other rate-limiting drug options are ruled out because of comorbidities or the person's preferences. **[2021]**

1.7.5 If monotherapy does not control the person's symptoms, and if continuing symptoms are thought to be caused by poor ventricular rate control, consider combination therapy with any 2 of the following:

- a beta-blocker
- diltiazem
- digoxin. **[2021]**

  In April 2021, this was an off-label use of diltiazem. See NICE's information on prescribing medicines.

1.7.6 Do not offer amiodarone for long-term rate control. **[2021]**

For a short explanation of why the committee made the 2021 recommendations and how they might affect practice, see the rationale and impact section on rate control.

Full details of the evidence and the committee's discussion are in evidence review I: non-ablative rate control therapies.

## Rhythm control

1.7.7 Consider pharmacological and/or electrical rhythm control for people with atrial fibrillation whose symptoms continue after heart rate has been controlled or for whom a rate-control strategy has not been successful.

**[2014]**

## Antiarrhythmic drug therapy

1.7.8 Assess the need for drug treatment for long-term rhythm control, taking into account the person's preferences, associated comorbidities, risks of treatment and likelihood of recurrence of atrial fibrillation. **[2014]**

1.7.9 Do not offer class 1c antiarrhythmic drugs such as flecainide or propafenone to people with known ischaemic or structural heart disease. **[2014]**

1.7.10 If drug treatment for long-term rhythm control is needed, consider a standard beta-blocker (that is, a beta-blocker other than sotalol) as first-line treatment unless there are contraindications. **[2014]**

1.7.11 If beta-blockers are contraindicated or unsuccessful, assess the suitability of alternative drugs for rhythm control, taking comorbidities into account. **[2014]**

1.7.12 Follow the advice on dronedarone as a second-line treatment option for long-term rhythm control after successful cardioversion (TA197). **[2014]**

**TA197: Dronedarone**

Dronedarone is recommended as an option for the maintenance of sinus rhythm after successful cardioversion in people with paroxysmal or persistent atrial fibrillation:

- whose atrial fibrillation is not controlled by first-line therapy (usually including beta-blockers), that is, as a second-line treatment option and after alternative options have been considered **and**
- who have at least 1 of the following cardiovascular risk factors:
  - hypertension requiring drugs of at least 2 different classes
  - diabetes mellitus
  - previous transient ischaemic attack, stroke or systemic embolism
  - left atrial diameter of 50 mm or greater **or**
  - age 70 years or older **and**
- who do not have left ventricular systolic dysfunction **and**
- who do not have a history of, or current, heart failure.

People who do not meet these criteria who are currently having dronedarone should have the option to continue treatment until they and their clinicians consider it appropriate to stop.

To see why we made these recommendations, read the full technology appraisal guidance on dronedarone for the treatment of non-permanent atrial fibrillation.

Find out why these recommendations look a little different from usual.

1.7.13 Consider amiodarone for people with left ventricular impairment or heart failure. **[2014]**

1.7.14 In people with infrequent paroxysms and few symptoms, or if symptoms are induced by known precipitants (such as alcohol, caffeine), a 'no drug treatment' strategy or a 'pill-in-the-pocket' strategy (in which

antiarrhythmic drugs are taken only when an episode starts) should be considered and discussed with the person. **[2006]**

1.7.15 In people with paroxysmal atrial fibrillation, a 'pill-in-the-pocket' strategy should be considered for those who:

- have no history of left ventricular dysfunction, or valvular or ischaemic heart disease and
- have a history of infrequent symptomatic episodes of paroxysmal atrial fibrillation and
- have a systolic blood pressure greater than 100 mmHg and a resting heart rate above 70 bpm and
- are able to understand how to, and when to, take the medication. **[2006]**

### Cardioversion

1.7.16 For people having cardioversion for atrial fibrillation that has persisted for longer than 48 hours, offer electrical (rather than pharmacological) cardioversion. **[2014]**

1.7.17 Consider amiodarone therapy starting 4 weeks before and continuing for up to 12 months after electrical cardioversion to maintain sinus rhythm, and discuss the benefits and risks of amiodarone with the person. **[2014]**

1.7.18 For people with atrial fibrillation of greater than 48 hours' duration, in whom elective cardioversion is indicated:

- both transoesophageal echocardiography (TOE)-guided cardioversion and conventional cardioversion should be considered equally effective
- a TOE-guided cardioversion strategy should be considered:
  - if experienced staff and appropriate facilities are available and
  - if a minimal period of precardioversion anticoagulation is indicated due to the person's choice or bleeding risks. **[2006]**

## Left atrial ablation

1.7.19 If drug treatment is unsuccessful, unsuitable or not tolerated in people with symptomatic paroxysmal or persistent atrial fibrillation:

- consider radiofrequency point-by-point ablation **or**
- if radiofrequency point-by-point ablation is assessed as being unsuitable, consider cryoballoon ablation or laser balloon ablation. **[2021]**

1.7.20 When considering left atrial ablation, discuss the risks and benefits and take into account the person's preferences. In particular, explain that the procedure is not always effective and that the resolution of symptoms may not be long-lasting. **[2021]**

1.7.21 Consider left atrial surgical ablation at the same time as other cardiothoracic surgery for people with symptomatic atrial fibrillation. **[2014]**

For NICE interventional procedures guidance on left atrial ablation for atrial fibrillation, see the NICE interventional procedures guidance on our topic page on heart rhythm conditions.

For a short explanation of why the committee made the 2021 recommendations and how they might affect practice, see the rationale and impact section on left atrial ablation.

Full details of the evidence and the committee's discussion are in evidence review J1: ablation, evidence review J2: ablation network meta-analysis and evidence review J3: ablation cost-effectiveness analysis.

### Preventing recurrence after ablation

1.7.22 Consider antiarrhythmic drug treatment for 3 months after left atrial ablation to prevent recurrence of atrial fibrillation, taking into account the person's preferences, and the risks and potential benefits. **[2021]**

1.7.23 Reassess the need for antiarrhythmic drug treatment at 3 months after

left atrial ablation. **[2021]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the rationale and impact section on preventing recurrence after ablation.

Full details of the evidence and the committee's discussion are in evidence review K: antiarrhythmic drugs after ablation.

### Pace and ablate strategy

1.7.24 Consider pacing and atrioventricular node ablation for people with permanent atrial fibrillation with symptoms or left ventricular dysfunction thought to be caused by high ventricular rates. **[2014]**

1.7.25 When considering pacing and atrioventricular node ablation, reassess symptoms and the consequent need for ablation after pacing has been carried out and drug treatment further optimised. **[2014]**

1.7.26 Consider left atrial catheter ablation before pacing and atrioventricular node ablation for people with paroxysmal atrial fibrillation or heart failure caused by non-permanent (paroxysmal or persistent) atrial fibrillation. **[2014]**

## 1.8 Management for people presenting acutely with atrial fibrillation

### Rate and rhythm control for people presenting acutely

1.8.1 Carry out emergency electrical cardioversion, without delaying to achieve anticoagulation, in people with life-threatening haemodynamic instability caused by new-onset atrial fibrillation. **[2014]**

1.8.2 In people with atrial fibrillation presenting acutely without life-threatening haemodynamic instability:

- offer either rate or rhythm control if the onset of the arrhythmia is less than 48 hours
- offer rate control if onset is more than 48 hours or is uncertain. **[2014]**

1.8.3 In people with atrial fibrillation presenting acutely with suspected concomitant acute decompensated heart failure, seek senior specialist input on the use of beta-blockers and do not use calcium-channel blockers. **[2021]**

1.8.4 Consider either pharmacological or electrical cardioversion depending on clinical circumstances and resources in people with new-onset atrial fibrillation who will be treated with a rhythm-control strategy. **[2014]**

1.8.5 If pharmacological cardioversion has been agreed on clinical and resource grounds for new-onset atrial fibrillation, offer:

- a choice of flecainide or amiodarone to people with no evidence of structural or ischaemic heart disease **or**
- amiodarone to people with evidence of structural heart disease. **[2014]**

1.8.6 In people with atrial fibrillation in whom the duration of the arrhythmia is greater than 48 hours or uncertain and considered for long-term rhythm control, delay cardioversion until they have been maintained on therapeutic anticoagulation for a minimum of 3 weeks. During this period offer rate control as appropriate. **[2006, amended 2014]**

1.8.7 Do not offer magnesium or a calcium-channel blocker for pharmacological cardioversion. **[2014]**

For a short explanation of why the committee made the 2021 recommendation and how it might affect practice, see the rationale and impact section on rate and rhythm control for people presenting acutely.

Full details of the evidence and the committee's discussion are in evidence review I: non-ablative rate control therapies.

### Anticoagulation for people presenting acutely with atrial fibrillation

1.8.8 In people with new-onset atrial fibrillation who are receiving no, or subtherapeutic, anticoagulation therapy:

- in the absence of contraindications, offer heparin at initial presentation
- continue heparin until a full assessment has been made and appropriate antithrombotic therapy has been started, based on risk stratification (see section 1.2 on assessment of stroke and bleeding risks and section 1.6 on stroke prevention). **[2006, amended 2014]**

1.8.9 In people with a confirmed diagnosis of atrial fibrillation of recent onset (less than 48 hours since onset), offer oral anticoagulation if:

- stable sinus rhythm is not successfully restored within the same 48-hour period after onset of atrial fibrillation **or**
- there are factors indicating a high risk of atrial fibrillation recurrence, including history of failed cardioversion, structural heart disease, prolonged atrial fibrillation (more than 12 months), or previous recurrences **or**
- it is recommended in section 1.2 on assessment of stroke and bleeding risks and section 1.6 on stroke prevention. **[2006, amended 2014]**

1.8.10 In people with new-onset atrial fibrillation, if there is uncertainty over the precise time since onset, offer oral anticoagulation as for persistent atrial fibrillation (see section 1.2 on assessment of stroke and bleeding risks and section 1.6 stroke prevention). **[2006, amended 2014]**

## 1.9 Initial management of stroke and atrial fibrillation

1.9.1 For guidance on the initial management of stroke and atrial fibrillation see recommendation 1.4.17 in NICE's guideline on stroke and transient ischaemic attack in over 16s. **[2014]**

# 1.10 Preventing and managing postoperative atrial fibrillation

## Preventing postoperative atrial fibrillation

1.10.1 In people having cardiothoracic surgery:

- reduce the risk of postoperative atrial fibrillation by offering 1 of the following:
  - amiodarone
  - a standard beta-blocker (that is, a beta-blocker other than sotalol)
  - a rate-limiting calcium-channel blocker (diltiazem or verapamil)
- do not offer digoxin. **[2006, amended 2014]**

  In April 2021, this was an off-label use of diltiazem. See NICE's information on prescribing medicines.

1.10.2 In people having cardiothoracic surgery who are already on beta-blocker therapy, continue this treatment unless contraindications develop (such as postoperative bradycardia or hypotension). **[2006, amended 2014]**

1.10.3 Do not start statins in people having cardiothoracic surgery solely to prevent postoperative atrial fibrillation. **[2021]**

1.10.4 In people having cardiothoracic surgery who are already on statins, continue this treatment. For further advice on statins for the prevention of cardiovascular disease, see NICE's guideline on cardiovascular disease: risk assessment and reduction. **[2021]**

For a short explanation of why the committee made the 2021 recommendations and how they might affect practice, see the rationale and impact section on preventing postoperative atrial fibrillation.

Full details of the evidence and the committee's discussion are in evidence review M: statins for preventing atrial fibrillation after cardiothoracic surgery.

# Managing postoperative atrial fibrillation

## Atrial fibrillation after cardiothoracic surgery

1.10.5 Consider either a rhythm-control or rate-control strategy for the initial treatment of new-onset postoperative atrial fibrillation after cardiothoracic surgery. **[2021]**

1.10.6 If a rhythm-control strategy is chosen, reassess the need for antiarrhythmic drug treatment at a suitable time point (usually at around 6 weeks). **[2021]**

## Atrial fibrillation after non-cardiothoracic surgery

1.10.7 Manage postoperative atrial fibrillation after non-cardiothoracic surgery in the same way as for new-onset atrial fibrillation with any other cause. **[2006, amended 2014]**

## Antithrombotic therapy for postoperative atrial fibrillation

1.10.8 In the prophylaxis and management of postoperative atrial fibrillation, use appropriate antithrombotic therapy and correct identifiable causes (such as electrolyte imbalance or hypoxia). **[2006, amended 2014]**

For a short explanation of why the committee made the 2021 recommendations and how they might affect practice, see the rationale and impact section on managing atrial fibrillation after cardiothoracic surgery.

Full details of the evidence and the committee's discussion are in evidence review L: treatment strategies for atrial fibrillation after cardiothoracic surgery.

## 1.11 Stopping anticoagulation

1.11.1 In people with a diagnosis of atrial fibrillation, do not stop anticoagulation solely because atrial fibrillation is no longer detectable. **[2021]**

1.11.2 Base decisions to stop anticoagulation on a reassessment of stroke and bleeding risk using $CHA_2DS_2$-VASc and ORBIT and a discussion of the person's preferences. **[2021]**

For a short explanation of why the committee made these recommendations and how they might affect practice, see the rationale and impact section on stopping anticoagulation.

Full details of the evidence and the committee's discussion are in evidence review H: discontinuing anticoagulation in people whose atrial fibrillation has resolved.

# Terms used in this guideline

This section defines terms that have been used in a particular way for this guideline.

### People with atrial fibrillation presenting acutely

People presenting with atrial fibrillation of definite recent onset or with destabilisation of existing atrial fibrillation. This does not include people with atrial fibrillation that has been discovered incidentally, for example through pulse palpitation before routine blood pressure measurement.

## Pill-in-the-pocket strategy

The person self-manages paroxysmal atrial fibrillation by taking antiarrhythmic drugs only when an episode of atrial fibrillation starts.

## Paroxysmal atrial fibrillation

Episodes of atrial fibrillation that stop within 7 days, usually within 48 hours, without any treatment.

# Recommendations for research

As part of the 2021 update, the guideline committee made 4 new research recommendations (marked **[2021]**). Research recommendations retained from the 2014 guideline are labelled **[2014]**.

## Key recommendations for research

### 1 Tests to diagnose persistent atrial fibrillation

What is the diagnostic accuracy of key index tests (such as the KardiaMobile heart monitor (AliveCor), MyDiagnostik, Microlife BP monitors, iPhone plethysmography and pulse palpation) compared with the gold standard of 12-lead ECG in people with risk factors for or symptoms of atrial fibrillation? **[2021]**

For a short explanation of why the committee made the recommendation for research, see the rationale on detection and diagnosis.

Full details of the evidence and the committee's discussion are in evidence review B: accuracy of tests for detection.

### 2 Tests to diagnose paroxysmal atrial fibrillation

What is the diagnostic accuracy of key index tests compared with the gold standard of prolonged ambulatory monitoring in people suspected of having paroxysmal atrial fibrillation? **[2021]**

For a short explanation of why the committee made the recommendation for research, see the rationale on detection and diagnosis.

Full details of the evidence and the committee's discussion are in evidence review B: accuracy of tests for detection.

## 3 Stopping anticoagulation after ablation

What is the clinical and cost effectiveness of stopping anticoagulation in people whose atrial fibrillation has resolved after ablation? **[2021]**

For a short explanation of why the committee made the recommendation for research, see the rationale on stopping anticoagulation.

Full details of the evidence and the committee's discussion are in evidence review H: discontinuing anticoagulation in people whose atrial fibrillation has resolved.

## 4 Stopping anticoagulation after resolution of postoperative atrial fibrillation

What is the clinical and cost effectiveness of stopping anticoagulation in people whose postoperative atrial fibrillation after cardiac surgery has resolved? **[2021]**

For a short explanation of why the committee made the recommendation for research, see the rationale on stopping anticoagulation.

Full details of the evidence and the committee's discussion are in evidence review H: discontinuing anticoagulation in people whose atrial fibrillation has resolved.

## 5 Cognitive behavioural therapy for people with atrial fibrillation

What is the clinical and cost effectiveness of cognitive behavioural therapy compared with usual care for people with newly diagnosed atrial fibrillation? **[2014]**

## 6 Rate-control drug treatment for people aged 75 and over with atrial fibrillation

What is the comparative effectiveness of the 3 main drug classes used for rate control (beta-blockers, calcium-channel blockers and digoxin) in people aged 75 and over with atrial fibrillation in controlling symptoms, improving quality of life and reducing morbidity and mortality? **[2014]**

# 7 Stroke risk assessment

Can routine data from UK primary care databases clarify stroke risk in people with atrial fibrillation according to baseline risk factors and treatment? **[2014]**

# Rationale and impact

These sections briefly explain why the committee made the recommendations and how they might affect practice.

## Detection and diagnosis

Recommendations 1.1.2 and 1.1.3

### Why the committee made the recommendations

The evidence did not support changing the recommended diagnostic tests to either replace 12-lead ECG as the test to confirm persistent atrial fibrillation or replace pulse palpation as the initial step for persistent atrial fibrillation in a 2-step strategy. The committee clarified that 12-lead ECG should be used as the test to confirm atrial fibrillation, to prevent the use of less accurate ECG devices, such as mobile and lead-I ECG devices. The committee agreed that, although the evidence showed that accuracy varied, there was some evidence that new devices were accurate and showed promise. It was noted that NICE has produced diagnostics guidance on lead-I ECG devices for detecting symptomatic atrial fibrillation using single time point testing in primary care. The committee made a research recommendation on tests to diagnose persistent atrial fibrillation to encourage further high-quality research in this area to guide future practice.

The committee agreed that the evidence on tests to detect paroxysmal atrial fibrillation was not clear enough to warrant a change in practice from the 2014 recommendation. However, the evidence did show that longer durations of detection increased accuracy. The committee made a research recommendation on tests to diagnose paroxysmal atrial fibrillation.

### How the recommendations might affect practice

The recommendations reflect current good practice and are unlikely to have an impact on practice.

Return to recommendations

# Stroke risk

Recommendation 1.2.1

## Why the committee made the recommendations

The committee decided to prioritise identifying people above or below a certain risk threshold (discrimination) in its interpretation of the evidence rather than estimating a person's risk of stroke in absolute terms.

The evidence suggested that a score of 2 or more is the ideal threshold for the $CHA_2DS_2$-VASC in terms of indicating the need for anticoagulation. (Men with a $CHA_2DS_2$-VASc score of 1 were regarded as being at intermediate risk, and a group in whom anticoagulation should also be considered.) The evidence showed that this threshold of 2 or more offered a good combination of high sensitivity (0.92) and adequate specificity (0.23).

The high sensitivity means that the tool would correctly identify almost everyone who would later have a stroke if they did not receive anticoagulants. Importantly, this will allow them to be prescribed anticoagulants to reduce their risk of stroke.

The adequate specificity means that 23% of the people who would not later have a stroke (even when not taking anticoagulants) would be correctly identified as not needing anticoagulation. This would prevent these people from having adverse events from anticoagulants. It also means that 77% of people who would not later have a stroke (without anticoagulation) would be wrongly identified as needing anticoagulation. However, this was thought to be acceptable given the perceived lesser harms from unnecessarily giving anticoagulants compared with not giving anticoagulants to people who need them, together with the inevitable trade-off between sensitivity and specificity.

The ATRIA stroke risk score was shown to have better overall accuracy, but although it had better specificity than $CHA_2DS_2$-VASc (fewer false-positive results) it had lower sensitivity, meaning that more people at risk would be missed (more false-negative results) compared with the $CHA_2DS_2$-VASc score. As already suggested, sensitivity was agreed by the committee to be more important than specificity because the risks of unnecessary anticoagulation are outweighed by the risks of not treating people who need anticoagulation. In addition, the ATRIA risk score may result in a time delay in calculating the results.

The committee also discussed that the evidence for the QStroke risk calculator suggested that it might be a useful tool. However, the evidence was limited, and they agreed that further research was needed.

### How the recommendation might affect practice

The recommendation does not constitute a change in practice, and so there would not be a resource impact on the NHS.

Return to recommendations

## Bleeding risk

Recommendations 1.2.2 to 1.2.4

### Why the committee made the recommendations

The committee agreed that anticoagulation should usually be considered in people at risk of stroke even if bleeding risk is high, and so a bleeding risk tool should not be used to provide a cut off for determining who should have anticoagulation. Instead, the tool should be used to provide accurate knowledge of absolute bleeding risk, which can support discussions between the person and their healthcare professional about bleeding risk modification and appropriate levels of vigilance. They therefore agreed that accurately estimating absolute risk (calibration) is more important than identifying a risk threshold for anticoagulation (discrimination) when choosing between different bleeding risk tools.

The committee focused on calibration data for the tools with the most evidence: ORBIT, HAS-BLED and ATRIA. The calibration evidence clearly suggested that ORBIT was more accurate than HAS-BLED and ATRIA at predicting absolute risk of major bleeding, both for people using vitamin K antagonists and those using direct-acting oral anticoagulants. Importantly, ORBIT was better calibrated at all levels of major bleeding risk, including higher levels. ORBIT was also better at predicting absolute risk of intracranial haemorrhage.

The discrimination data showed little difference between tools in predicting major bleeding, with some outcome measures showing no difference and others showing a slight benefit for either ORBIT or HAS-BLED. Evidence showed that ORBIT had a significantly

higher specificity and a slighter lower sensitivity than the other tools, but the committee agreed that the lower sensitivity would not be a drawback when used to inform discussions of risk.

The committee agreed that the evidence overall, and particularly the calibration data demonstrating higher accuracy of absolute risk, strongly supported ORBIT as the tool of choice.

The committee agreed that NICE's previous advice on monitoring and addressing modifiable risk factors was still relevant and added reversible causes of anaemia because it is a component of the ORBIT tool.

## How the recommendations might affect practice

Use of the ORBIT score is a change in practice, which will take time to implement. The committee considered that the more accurate prediction of the absolute risk of bleeding is a real advantage in supporting patients and clinicians in shared decision making, which should lead to better clinical outcomes. The committee considered carefully a number of practical issues set out in this section. Overall, the committee concluded that this change is one that is worth making.

One potential concern discussed by the committee is that ORBIT does not include all of the modifiable risk factors included in HAS-BLED so does not serve as a reminder of these to clinicians. However, the committee considered that fully investigating modifiable risk factors is established clinical practice, regardless of the tool used.

Another potential challenge is that ORBIT is not the recommended bleeding risk tool for other conditions (such as venous thromboembolism). Therefore, an initial transition period may be needed for training and education in both primary and secondary care while healthcare professionals become familiar with the tool. This will have a resource impact, although it will be time limited. The committee also noted that use of the ORBIT tool, and access to online versions, is straightforward.

Finally, the committee also discussed that, unlike HAS-BLED, ORBIT is not embedded in GP systems, which may cause some initial practical difficulties. However, because this will involve changes to centralised software, it is thought that it will be straightforward to implement and ORBIT will quickly be included in GP systems. Neither tool is included in hospital systems although both are widely available on smartphone apps.

Return to recommendations

# Stroke prevention

Recommendations 1.6.1 to 1.6.8

## Why the committee made the recommendations

Evidence from an analysis of several studies showed that direct-acting oral anticoagulants are more effective than warfarin for a number of outcomes. An economic model also showed that they offered a better balance of benefits to costs than warfarin. There were no studies directly comparing the direct-acting anticoagulants head-to-head but indirect comparisons based on the clinical evidence showed that the different direct-acting oral anticoagulants offered different benefits depending on the outcome considered. When all these outcomes were combined in the cost-effectiveness analysis, apixaban was the most clinically effective and cost-effective anticoagulant based on UK drug tariff prices at the time. However, the committee had concerns over the lack of head-to-head comparisons, differences in the study populations and uncertainties in the economic model.

Based on the evidence and their experience, the committee decided not to recommend one direct-acting oral anticoagulant over the others, but instead to emphasise that treatment should be tailored to the person's clinical needs and preferences. Each anticoagulant has different risks and benefits that should be considered and fully discussed with the person as part of informed shared decision making. The committee highlighted that the choice might be affected by factors such as renal impairment and swallowing difficulties, and that healthcare professionals should refer to the BNF for advice on contraindications and cautions. They also stressed the importance of adherence and factors that might affect this, such as dosing frequency, when making the decision. If direct-acting oral anticoagulants are not suitable, for example in people with antiphospholipid syndrome, the committee agreed that a vitamin K antagonist should be offered.

For people already established and stable on a vitamin K antagonist, the committee agreed that the benefits of changing to a direct-acting anticoagulant need to be discussed. Therefore, the risks and benefits of changing medication, the person's time in therapeutic range and the person's preferences should be explored at their next routine appointment.

The committee agreed that the existing thresholds for the $CHA_2DS_2$-VASc score threshold

for anticoagulation are in line with current practice.

Although bleeding risk scores may occasionally be used as a reason not to offer anticoagulation, the committee agreed that they should typically be used as a prompt to identify and manage modifiable risk factors for bleeding rather than as a reason for not offering anticoagulation in people at increased risk. The committee discussed that when anticoagulation is not given because of bleeding risk, people should have regular review and reconsideration for treatment.

The committee were concerned that anticoagulation is sometimes not recommended for people at risk of falls and for older people, even though age is factored into the bleeding risk score and falls are rarely a cause of major haemorrhage. Age was therefore added to the previous recommendation on people at risk of falls to ensure that anticoagulation is offered in this population when needed. The benefits and harms should be discussed with the person.

### How the recommendations might affect practice

The recommendations are likely to lead to a change in current practice, with a reduction in warfarin use. The committee noted that this has been a prescribing trend over recent years and it may lead to a contraction in warfarin clinic services. The unit cost of direct-acting anticoagulants is greater than that for warfarin, so there is likely to be a resource impact from increased use of direct-acting anticoagulants.

Return to recommendations

## Rate control

Recommendations 1.7.2 to 1.7.6

### Why the committee made the recommendations

The committee made some updates to the 2014 recommendations, based on their experience and knowledge.

The use of beta-blockers or rate-limiting calcium-channel blockers for initial rate-control treatment was retained by the committee because this is current practice and there was

insufficient evidence to suggest an alternative option. The committee agreed that the choice of treatment should still be made based on the symptoms, heart rate, comorbidities and preferences of those being treated.

The committee agreed that the recommendations should refer to NICE's guideline on chronic heart failure for advice on using beta-blockers and avoiding rate-limiting calcium-channel blockers such as diltiazem and verapamil in people who have atrial fibrillation with heart failure.

The committee agreed that digoxin monotherapy for non-paroxysmal atrial fibrillation should continue to be considered for people who are sedentary. Based on their experience, the committee agreed that it may also be considered as a treatment option when other rate-limiting drugs are not suitable, so they expanded the recommendation in the previous guideline to also cover these circumstances. The committee were aware that some clinicians feel that digoxin monotherapy is often better than alternatives for improving symptoms; however, the lack of evidence currently available meant that the recommendation for digoxin was not expanded to cover further groups of people.

In the absence of new evidence, the committee also agreed with the existing recommendation for combination therapy options if initial monotherapy fails, which is consistent with the committee's experience and current practice.

There was a lack of evidence on long-term rate control, and the committee were aware of numerous serious side effects associated with the long-term use of amiodarone (including thyroid, lung and nerve damage), many of which are irreversible. The committee noted that although the most common side effects were less severe, the occurrence of severe side effects was unpredictable and long-term rate control with amiodarone should be avoided. Amiodarone should only be used as an interim therapy, for example while waiting for cardioversion, and would not usually be taken for longer than 12 months.

## How the recommendations might affect practice

The recommendations reflect current practice. Digoxin monotherapy may now be an option in non-paroxysmal atrial fibrillation if comorbidities or patient preferences limit other rate-control drug choices. However, the committee agreed that this already happens in practice.

Return to recommendations

# Left atrial ablation

Recommendations 1.7.19 to 1.7.20

## Why the committee made the recommendations

Ablation may be a treatment option if antiarrhythmic drug treatment has not been successful or is not tolerated. The committee reviewed new clinical and health economic evidence for the different types of ablation for people with paroxysmal atrial fibrillation and agreed that the catheter ablation techniques were the most clinically effective ablation options. Thoracoscopy and the hybrid techniques led to lower recurrence, but they also led to more serious adverse effects. There were no clear differences in efficacy between the 4 catheter ablation techniques: radiofrequency point-by-point, radiofrequency multi-electrode, laser and cryoballoon ablation.

A new economic model was developed for the guideline using the clinical evidence from people with paroxysmal atrial fibrillation. It showed that radiofrequency point-by-point ablation was more cost effective over a lifetime than antiarrhythmic drug treatment and other ablation strategies in people for whom 1 or more antiarrhythmic drug has failed. Cryoballoon, radiofrequency multi-electrode and laser ablation were the second, third and fourth most cost-effective options respectively.

The committee acknowledged that the NHS reference cost used for the catheter ablation procedures may not fully capture differences in resource use between the different techniques. However, despite further analysis to adjust costs and account for this, radiofrequency point-by-point ablation remained the most cost-effective option, and other catheter ablation techniques are therefore unlikely to provide a cost-effective use of NHS resources. Based on the economic model results the committee agreed that radiofrequency point-by-point ablation should be considered in people with symptomatic paroxysmal atrial fibrillation if drug treatment is unsuccessful, unsuitable or not tolerated.

The committee noted that cryoballoon and laser ablation may be more suitable for some patients because they can sometimes be carried out without general anaesthesia, and cryoballoon ablation may be quicker to perform, with same-day discharge more likely. There is also an increased risk of fluid overload from saline irrigated radiofrequency ablation. They decided that either cryoballoon or laser ablation could be considered if radiofrequency point-by-point ablation is not suitable; for example, if a short procedure time is a priority or for people with a recent history of decompensated heart failure who

are at increased risk of fluid overload. Radiofrequency multi-electrode was not included as an alternative due to its lower efficacy relative to cryoballoon and laser ablation and concerns about a higher risk of stroke.

There was limited evidence for ablation in people with persistent atrial fibrillation. Despite this, the committee decided that the evidence, combined with their experience and knowledge (also noting the Packer et al. CABANA randomized clinical trial, 2019, which contained a mixed population of people with persistent and paroxysmal atrial fibrillation) was sufficient to support ablation as an option to be considered for those with persistent symptoms that are not alleviated by, or who cannot have, antiarrhythmic drugs. The committee agreed that ablation can be effective in people with persistent atrial fibrillation, and that this population might have as much to gain from ablation as people with paroxysmal symptoms. The committee agreed that the cost-effectiveness analyses of different types of ablation in paroxysmal atrial fibrillation could also be applied to this population.

The committee emphasised the importance of discussing the risks and benefits of catheter ablation with the person, in particular the risk of adverse events. The discussion should also include that, in the experience of the committee, the effects of ablation may not be long term.

### How the recommendations might affect practice

The committee noted that the recommendations are likely to reinforce current practice. Ablation is carried out in a relatively restricted population (approximately 1% to 2% of all people with atrial fibrillation currently have ablation) and is usually reserved for people in whom antiarrhythmic drugs have failed. The recommendation is likely to lead to a change in the types of ablation offered, with more people receiving radiofrequency point-by-point ablation and fewer having other catheter ablation techniques.

Return to recommendations

## Preventing recurrence after ablation

Recommendations 1.7.22 and 1.7.23

## Why the committee made the recommendations

Most of the evidence on preventing recurrence after ablation was for amiodarone. The evidence suggested that amiodarone may reduce recurrence of atrial fibrillation after ablation. However, there was evidence of an increased risk of hospitalisation and the committee noted the known side effects of amiodarone, which, although rare, can be severe and life-threatening.

There was a lack of evidence for other antiarrhythmic drugs and there were no comparisons between different antiarrhythmic drugs. Therefore, the committee agreed that there was too much uncertainty to recommend one specific antiarrhythmic drug over others.

In addition, the studies often made no distinction between people who had been on antiarrhythmic drugs up to ablation and those who had not. There is variation in current practice on whether people who were not previously taking antiarrhythmic drugs should start them after ablation to reduce recurrence. However, the evidence did not support making separate recommendations to clarify this.

The committee decided that antiarrhythmic drug treatment should be considered after ablation, but only after discussion with the person, taking into account their preferences for treatment and the potential individual risks and benefits. In particular, the committee noted that people should fully understand the potential adverse events associated with these drugs. While there is some variation, the committee agreed that good current practice is for patients taking antiarrhythmic drugs up to ablation to continue them for 3 months after ablation and reassess the need for drug treatment after this time.

## How the recommendations might affect practice

There is some variation in current practice. Practice is likely to change in some centres both in prescribing and in the need for a more formal reassessment of treatment at 3 months. The impact on use of antiarrhythmic drugs is difficult to predict, but there may be an increase from current levels. Increased resources may be needed for reassessment, but it is anticipated that this could be performed at routine follow-up appointments with a cardiologist.

Return to recommendations

# Rate and rhythm control for people presenting acutely

Recommendation 1.8.3

## Why the committee made the recommendation

The committee agreed that the evidence was too limited in quality and quantity to be able to specify a preferred rate-control drug for acute atrial fibrillation. Although there was some evidence that amiodarone was better than digoxin for rate control, the committee had concerns about the quality of the evidence and the short timeframe used in 1 study, which it agreed could disadvantage digoxin. In addition, there was limited evidence available for morbidity and adverse events for this comparison and no evidence identified for other drug classes.

The committee highlighted that the existing recommendations gave no guidance on acute atrial fibrillation with acute decompensated heart failure. Using their expertise and experience the committee agreed that advice on the use of beta-blockers and rate-limiting calcium-channel blockers should be included because they can lead to further deterioration in people with pulmonary oedema caused by heart failure.

## How the recommendation might affect practice

The recommendations do not constitute a change in practice, and so are unlikely to have a resource impact.

Return to recommendations

# Preventing postoperative atrial fibrillation

Recommendations 1.10.3 and 1.10.4

## Why the committee made the recommendations

The committee noted that the most recent studies reviewed showed no benefit from statins in reducing atrial fibrillation after cardiothoracic surgery. This contrasted with analysis of the evidence overall, which showed a small but definite benefit from statins.

The committee agreed that the evidence of no effect in the newer studies was important, because these studies were larger and of higher quality than the older studies included in the analysis.

Although the newer studies suggested that statins did not affect the short-term risk of stroke, they did suggest a greater risk of mortality in the peri-operative period compared with placebo treatment or usual care. The committee agreed that although the additional risk of death was probably small, it was important, especially alongside the lack of convincing evidence of benefit.

For these reasons, the committee decided that statins should not be given to prevent atrial fibrillation after cardiothoracic surgery. However, the committee wanted to highlight that statins have an important role in preventing cardiovascular events other than atrial fibrillation and that people already taking statins for other reasons should continue to do so.

### How the recommendations might affect practice

The committee agreed that the recommendation would not constitute a change in practice, and that there would not be a resource impact on the NHS.

Return to recommendations

## Managing atrial fibrillation after cardiothoracic surgery

Recommendations 1.10.5 and 1.10.6

### Why the committee made the recommendations

The evidence on managing postoperative atrial fibrillation after cardiothoracic surgery in people without pre-existing atrial fibrillation was limited – many of the studies reviewed were old and included small numbers of participants. There were few studies comparing drug classes, and the committee agreed that they could not recommend a particular class of drugs based on such limited evidence.

One larger study comparing mixed rate control and rhythm control with a

potassium-channel blocker (amiodarone) with or without rate control suggested little difference between the 2 groups. Based on this evidence and their experience, the committee decided that rhythm control could be considered but that the evidence no longer supported the stronger recommendation included in the 2014 guideline. The committee noted that postoperative atrial fibrillation often resolves naturally, meaning that rate control rather than rhythm control may be a suitable option for some people. Reducing the emphasis on rhythm-control strategies will allow rate-control strategies to be considered if appropriate for the person.

The committee were also aware of the risk of adverse events if amiodarone, a rhythm control drug, is taken long-term. They highlighted that if a rhythm-control strategy is chosen, the need for rhythm control drugs should be reassessed at approximately 6 weeks, in line with current practice, and they should not be continued automatically for long periods of time. The committee agreed that 6 weeks is an appropriate time point to assess the person's recovery, including for example prosthetic valve function, and to check if sinus rhythm has been restored.

The committee did not make a separate recommendation for people with pre-existing atrial fibrillation because of a lack of evidence. The committee noted that most people undergoing mitral valve surgery with pre-existing atrial fibrillation would undergo left atrial surgery to treat atrial fibrillation at the same time.

### How the recommendations might affect practice

Rhythm control for the treatment of new-onset atrial fibrillation after cardiothoracic surgery is current practice and amiodarone is most commonly used. This can still be considered, but there may be a reduction in the use of rhythm control in this population and an increase in the use of rate-control drugs instead.

Return to recommendations

## Stopping anticoagulation

Recommendations 1.11.1 and 1.11.2

## Why the committee made the recommendations

There was limited evidence on whether to continue anticoagulation or to stop it and switch to aspirin after successful treatment of atrial fibrillation by catheter ablation. The committee agreed that the evidence was insufficient and that there was too much uncertainty in the results to make a recommendation based on the evidence. The committee therefore developed research recommendations on stopping anticoagulation after ablation and stopping anticoagulation after resolution of postoperative atrial fibrillation to encourage further research.

The committee was concerned about the potential withdrawal of anticoagulation in people who had not had ablation or cardiac surgery for atrial fibrillation, but in whom sinus rhythm is now present and atrial fibrillation is no longer detectable. In particular, the committee noted that paroxysmal atrial fibrillation is not always detectable. Based on their experience, the committee made a consensus-based recommendation to ensure that decisions about stopping anticoagulation in this population are based on formal risk assessment of stroke and bleeding risks and patient preference.

## How the recommendations might affect practice

The committee felt that the recommendation would not constitute a change in practice, and that there would not be a resource impact on the NHS.

Return to recommendations

# Context

Atrial fibrillation is the most common heart rhythm disorder (affecting approximately 2% of the adult population), and estimates suggest its prevalence is increasing. Atrial fibrillation causes palpitations and breathlessness in many people but it may be silent and undetected. If left untreated it is a significant risk factor for stroke and other morbidities: it is estimated that it is responsible for approximately 20% of all strokes and is associated with increased mortality. Men are more commonly affected than women and the prevalence increases with age and in underlying heart disease, diabetes, obesity and hypertension.

Atrial fibrillation is typically detected as an irregular pulse or an irregular rhythm on an electrocardiogram (ECG). This may be an incidental finding or may arise while investigating symptoms suggestive of the disease. Because atrial fibrillation can be intermittent, detection and diagnosis may be challenging.

The aim of treatment is to prevent complications, particularly stroke, and alleviate symptoms. Drug treatments include anticoagulants to reduce the risk of stroke and antiarrhythmics to restore or maintain the normal heart rhythm or to slow the heart rate in people who remain in atrial fibrillation. Non-pharmacological management includes electrical cardioversion, which may be used to 'shock' the heart back to its normal rhythm, and catheter or surgical ablation to create lesions to stop the triggers that cause atrial fibrillation. These procedures can markedly reduce the symptom burden when drug therapy is ineffective or not tolerated.

This update focuses on areas of new evidence and changing practice since the 2014 NICE guideline. These include methods of identifying atrial fibrillation; assessing stroke and bleeding risk; antithrombotic agents; ablation strategies; preventing recurrence; and preventing and managing postoperative atrial fibrillation. This guideline update includes recommendations on these specific issues.

The recommendations apply to adults (18 years or older) with atrial fibrillation, including paroxysmal (recurrent), persistent and permanent atrial fibrillation, and atrial flutter. They do not apply to people with congenital heart disease precipitating atrial fibrillation.

# Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the NICE webpage on heart rhythm conditions.

For full details of the evidence and the guideline committee's discussions, see the evidence reviews. You can also find information about how the guideline was developed, including details of the committee.

NICE has produced tools and resources to help you put this guideline into practice. For general help and advice on putting our guidelines into practice, see resources to help you put NICE guidance into practice.

# Update information

**30 June 2021:** We further corrected recommendation 1.2.2 on using the ORBIT score to assess bleeding risk to reinstate the link to the previous calculation tool, which was amended in error on 10 June. The tool includes the full criteria, including options for reduced haemoglobin and reduced haematocrit which are available once the patient's sex has been selected.

**10 June 2021:** We amended recommendation 1.2.2 on using the ORBIT score to assess bleeding risk so that it links to a calculation tool that includes the full list of criteria, including reduced haemoglobin, reduced haematocrit and history of anaemia. We deleted a paragraph of text from the rationale and impact section for recommendation 1.8.3 that was included incorrectly.

**April 2021:** We have reviewed the evidence and made new recommendations on diagnosis and assessment, assessment of stroke and bleeding risks, preventing stroke, rate and rhythm control, preventing recurrence, and preventing and managing postoperative atrial fibrillation. These recommendations are marked **[2021]**.

Recommendations marked **[2014]** and **[2006]** last had an evidence review in 2014 and 2006 respectively. In some cases, minor changes have been made to the wording for clarity and to bring the language and style up to date, without changing the meaning.

**Minor changes since publication**

**August 2023:** As part of our work to make our guidance more useful and usable, we are testing out some changes to improve the way we present our guidance.

Recommendations from the following technology appraisals guidance have been brought into this guideline:

- TA275: apixaban
- TA249: dabigatran etexilate
- TA355: edoxaban
- TA256: rivaroxaban

- TA197: dronedarone.

This is so that healthcare professionals can see our recommendations for these medicines quickly, at the right point in this guideline and without having to click onto another page.

This is something we are testing with our users at the moment. It is not the final presentation. Tell us what you think using our survey, or if you have any questions, contact us at contenttransformation@nice.org.uk.

**January 2022:** Minor changes to redirect NICE Pathways links.

**October 2021:** We added a link to NICE's shared decision making guideline in recommendation 1.4.2.

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# Accreditation