

Assessing stroke risk in patients with AF

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How should AF be investigated?

Should rhythm or rate be controlled?

When should aspirin or warfarin be used?



ATRIAL FIBRILLATION (AF) IS THE MOST COMMON CHRONIC CARDIAC ARRHYTHMIA. IT IS

characterised by rapid and chaotic activation of the atria. This results in the failure of coordinated atrial contraction, predisposing the patient to the formation of intra-atrial thrombi and possible embolic stroke. Rapid conduction through the atrioventricular (AV) node results in a rapid ventricular rate that, along with the loss of the contribution of atrial contraction to ventricular filling, can result in cardiac failure.

AF is associated with considerable morbidity and mortality. The mortality rate of patients with AF is approximately double that of patients in normal sinus rhythm.¹ The arrhythmia accounts for 10-15% of all ischaemic strokes, and 25% of ischaemic strokes in patients over 80 years of age.²

In 2001-2002, the prevalence of AF in Scotland was 8.7 per 1,000, increasing dramatically with age to 71 per 1000 in people aged over 85 years. The prevalence was higher among men.³

Currently there are an estimated 4.5m people in the European Union with paroxysmal or persistent AF, »

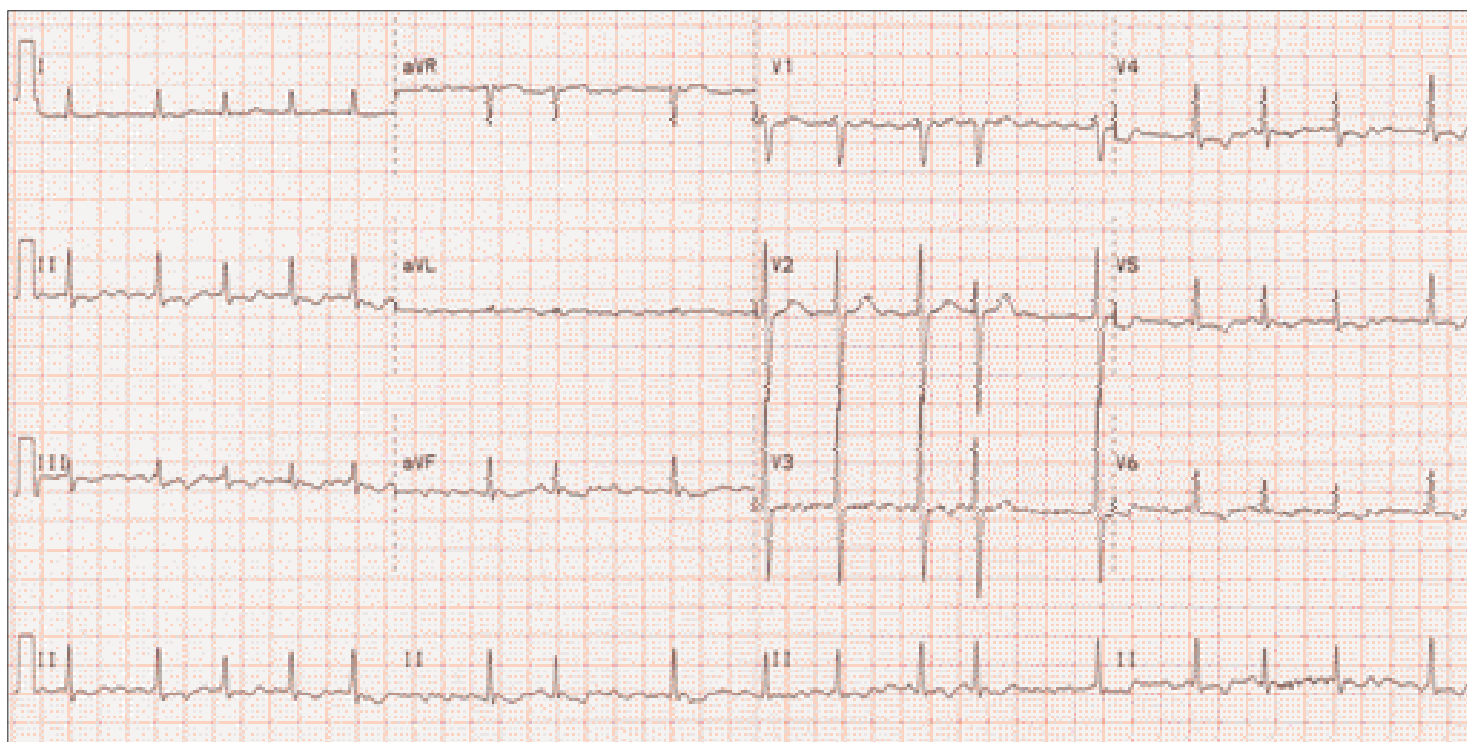


FIGURE 1

A 12-lead electrocardiogram (ECG) of atrial fibrillation. The ventricular rate is about 100 beats per minute and the rhythm is irregular (most clearly seen in the lower tracing, the lead-II rhythm strip). There are no P waves, but low amplitude atrial fibrillatory waves can be seen between the QRS complexes

costing the EU around €13.5 billion per year.¹ This burden is likely to increase as the population ages.

The temporal behaviour of AF is described as paroxysmal, persistent or permanent:

- Paroxysmal AF spontaneously reverts to sinus rhythm within seven days, usually within 48 hours.
- Persistent AF lasts longer than seven days or requires electrical or pharmacological intervention to restore sinus rhythm.
- AF is described as permanent when cardioversion has either failed or been deemed inappropriate.

This classification can be useful in guiding treatment, but the basic principles of treatment remain similar for each category.

In recent years the results of large, randomised trials and the emergence of new catheter-based ablation techniques have modified treatment strategies for AF. Management of this condition revolves around the choice of treatments either to control the ventricular rate or to achieve and maintain sinus rhythm – rate versus rhythm control.

These options are not necessarily mutually exclusive. A patient with paroxysmal AF may benefit from rate control during episodes and from rhythm control to reduce the frequency of symptoms. However,

in persistent AF the choice is either to accept AF as the long-term rhythm and ensure rate control, or follow a rhythm control strategy to restore and maintain normal rhythm (although in the knowledge that recurrence rates are high, in which case rate control would also be advantageous).

Some drugs may provide both rate and rhythm control (for example β -blockers, in particular sotalol, or amiodarone).

Recent guidelines covering the management of patients with AF have been published by NICE⁴ and European and American cardiology bodies.¹

The appropriate use of anticoagulant or antiplatelet agents to reduce the risk of stroke is critical to the success of both treatment strategies.

DIAGNOSIS

The diagnosis of AF is suggested by an irregular pulse and is confirmed by an electrocardiogram (ECG) showing an absence of P waves and irregular QRS complexes (see figure 1, above).

Patients may present with symptoms secondary to AF. These include:

- Breathlessness
- Palpitations
- Dizziness or syncope
- Chest pain
- Stroke or transient ischaemic attack.

However, many patients with AF are asymptomatic and the diagnosis is often opportunistic. All patients who have an irregular pulse or symptoms suggestive of AF should have an ECG.

In patients with suspected paroxysmal AF, ambulatory ECG monitors may be required to confirm the diagnosis. Twenty four hour ECG monitors are recommended for patients with suspected asymptomatic recurrent AF or with symptomatic episodes separated by less than 24 hours.⁴ An event recorder may be used for patients with more infrequent symptomatic episodes.

AF is more likely to occur in patients with other common cardiovascular diseases, such as ischaemic heart disease, valvular heart disease, heart failure, diabetes and hypertension.

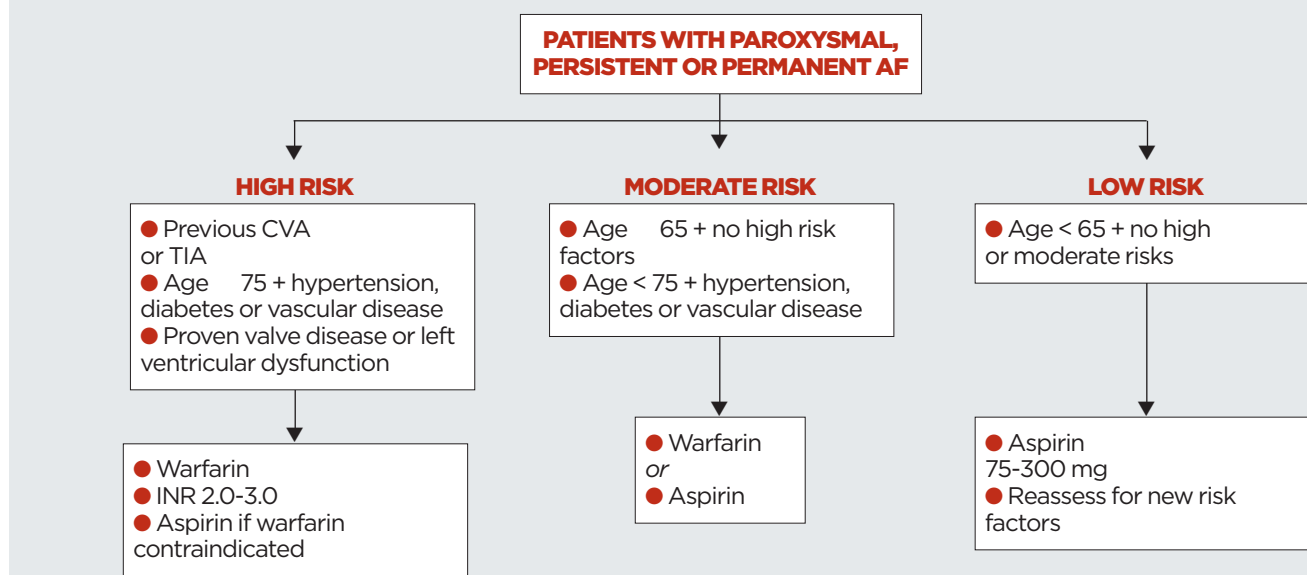
Other risk factors for developing AF include:

- Congenital heart disease
- Hyperthyroidism
- Alcohol excess
- Sepsis.

However, AF can develop without an overt underlying cause ('lone AF').

Given the morbidity and mortality associated with AF, and the possibility of easily identifying at-risk groups, should we be screening patients for AF? The SAFE study, a randomised controlled trial involving GP practices in the West Midlands, found that »

Figure 2. Antithrombotic treatment for AF



Adapted from NICE guideline 36. CVA = cerebrovascular accident/ stroke, TIA = transient ischaemic attack

opportunistic, but not systematic, screening for AF on an annual basis was a cost-effective alternative to routine practice or targeted screening of patients (see p41).⁵

The assessment of patients with AF requires a full history and clinical examination in order to identify additional comorbidities and assess stroke risk.

Investigation of a patient with AF should include ECG and TFTs as a minimum. Excluding anaemia is relevant with respect to anticoagulant or antiplatelet therapy.

Echocardiography is indicated in selected patients. Exercise testing is not necessary, and may not be advisable until the arrhythmia is controlled. Patients with a history of chest pain should be investigated appropriately, including exercise testing once AF is controlled.

The main questions to be addressed by history and examination are related to coexisting disease, including cardiac disease. A history of coronary artery disease, rheumatic fever, the finding of hypertension or of a cardiac murmur may contribute to the risk assessment and the indications for echocardiography.

The NICE guideline recommends echocardiography in selected patients to guide treatment decisions. These include patients for whom a rhythm control strategy is being considered

and patients for whom there is a high clinical suspicion of structural heart disease, such as left ventricular dysfunction, myocardial infarction, valve disease or hypertension. It may also be helpful for some patients in determining their risk of thromboembolism and the need for antithrombotic therapy (see figure 2, above), although there is no need for echocardiography to be routinely performed on those who clearly fulfil the current recommendations for anticoagulation.⁴ Many hospitals provide an open access echo service to which appropriate patients can be referred.

MANAGEMENT

Rate control

The aim of a rate control strategy is to minimise symptoms associated with tachycardia and reduce the risk of tachycardia-induced heart failure by reducing conduction through the AV node. Beta-blockers or rate-limiting calcium channel antagonists, such as diltiazem and verapamil, are the first-line choice of drugs recommended by NICE for ventricular rate control.

Digoxin is not recommended as monotherapy, except in elderly or very sedentary patients, as it is not good at controlling ventricular rate during exercise. It can be useful as an additional agent when adequate rate control is not achieved with a first-line drug.

Optimal rate control may vary depending on the patient, but is generally a heart rate of between 60 and 90 beats per minute at rest and <110 beats per minute during exercise.

Rhythm control

The aim of a rhythm control strategy is to minimise the symptoms and complications of AF by restoring and maintaining sinus rhythm. For patients with persistent AF this initially requires the restoration of sinus rhythm, either by electrical cardioversion or drug therapy with flecainide or amiodarone.

Patients with persistent AF (at least one week's duration) may be considered for cardioversion. Patients presenting with recent onset AF may be considered for cardioversion, as long as the duration is less than 48 hours. After 48 hours, patients should be anticoagulated for at least three weeks before cardioversion. An alternative is to perform a transoesophageal echo to exclude an intra-atrial thrombus, but the patient should still be anticoagulated after cardioversion, for a minimum of four weeks, or indefinitely if they have moderate to high risk of thrombi.

Unfortunately there is a high rate of recurrence of AF following cardioversion, and many patients require additional treatment with long-term anti-arrhythmic drugs to maintain sinus rhythm.

The choice of anti-arrhythmic will depend on the individual patient »

and is particularly influenced by the presence of coexisting structural heart disease. In the absence of structural heart disease, β -blockers are recommended, with flecainide, sotalol or amiodarone as alternatives.

For some patients with infrequent, symptomatic but haemodynamically stable paroxysms of AF, a 'pill in the pocket' strategy may be employed. The patients can self-medicate with single doses of a drug, such as flecainide or propafenone, if it has previously been shown to be safe and effective in hospital. When structural heart disease is present this treatment strategy is not appropriate, and long-term β -blockers or amiodarone are safer options.⁶

Catheter ablation of the pulmonary veins and left atrium can be used to interrupt and prevent the spread of abnormal electrical activity responsible for AF, and can be a long-term curative procedure that removes the need for continued anti-arrhythmic drug therapy. However, it is a procedure requiring a highly skilled operator, success rates are variable and procedural risks include stroke and cardiac tamponade.

The rhythm control strategy is hindered primarily by the limited efficacy and the side-effects of many of the anti-arrhythmic drugs, in particular the toxicity of long-term amiodarone therapy and the risk of inducing life-threatening ventricular arrhythmias with drugs such as sotalol or flecainide.

The potential complexities involved in this strategy and the need for cardioversion or specialised invasive treatments mean that patients for whom a rhythm control strategy is appropriate should be referred to a cardiology specialist (see table 1, p39.)

Rate versus rhythm control

Although there are clear advantages in maintaining sinus rhythm in terms of preventing complications and symptoms, a rate control strategy would appear to be easier to achieve, involves simpler drug choices, has fewer side-effects and requires less monitoring and specialist input.

There has been increased support for a rate control strategy recently in light of several large, randomised controlled trials comparing rate and rhythm control. The AFFIRM study showed that rate control was not inferior to rhythm control, in terms of mortality and morbidity from cardiovascular causes, for the treatment of persistent AF.⁷ »

key points

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NICE recommends the use of warfarin in AF patients at high risk of stroke, and aspirin 75-300mg for low risk.

The assessment of patients with AF requires a full history and clinical examination in order to identify additional comorbidities and assess stroke risk.

All patients who have an irregular pulse or symptoms suggestive of AF should have an ECG.

AF is the most common chronic cardiac arrhythmia. It is characterised by rapid and chaotic activation of the atria and accounts for 10-15% of all ischaemic strokes. Prevalence is higher among men and increases dramatically with age.

Digoxin is not recommended as monotherapy, except in elderly or very sedentary patients, as it is not good at controlling ventricular rate during exercise.

Management of AF revolves around the choice of treatments to control the ventricular rate or to achieve and maintain sinus rhythm – rate versus rhythm control.

AF is more likely to occur in patients with other common cardiovascular diseases, such as ischaemic heart disease, valvular heart disease, heart failure, diabetes and hypertension. Other risk factors for developing AF include congenital heart disease, hyperthyroidism, alcohol excess and sepsis. AF can develop without an overt underlying cause ('lone AF').

Echocardiography is recommended in selected patients to guide treatment decisions. These include patients for whom a rhythm control strategy is being considered and patients for whom there is a high clinical suspicion of structural heart disease that may influence management.

Beta-blockers or rate-limiting calcium channel antagonists, such as diltiazem and verapamil, are the first-line choice of drugs as part of a rate control strategy.

A rate control strategy would appear to be easier to achieve, but a rhythm control strategy is used first for those patients with paroxysmal AF, or those with persistent AF who are young (< 65 years), or present for the first time with lone AF or AF secondary to a treated precipitant or those with cardiac failure.

Table 1

Patients requiring referral to a specialist

- Patients with haemodynamically unstable AF
- Patients considered for rhythm control of AF
- Patients with AF and additional cardiac disease

However, there are patient groups for whom a rhythm control strategy is appropriate, preferable and has a high success rate. The NICE guideline recommends a rhythm control strategy is used first for:

- Patients with paroxysmal AF
- Young patients (< 65 years) with persistent AF
- Patients who present for the first time with lone AF
- Patients with AF secondary to a treated precipitant
- Patients with cardiac failure.

A rate control strategy should be used for:

- All patients with permanent AF
- Patients with persistent AF who are >65 years old or have coronary artery disease
- Patients for whom anti-arrhythmic drugs are contraindicated, or who are unsuitable for cardioversion.

Patients who remain particularly symptomatic despite adequate rate control should be considered for rhythm control, and patients in whom rhythm control fails should be rate controlled.

Anticoagulation

The assessment of stroke risk and the administration of appropriate antithrombotic treatment is arguably the most important aspect of AF management in terms of reducing morbidity and mortality. The risk of stroke is not standard for all patients with AF and varies according to the presence of additional risk factors, such as age and cardiovascular disease.

For young patients with no risk factors for stroke other than AF, the annual risk of stroke is less than 1%. However, for those with multiple risk factors the annual risk can exceed 8%.²

Warfarin and aspirin have both been shown to reduce the incidence of stroke in AF patients compared with placebo. Warfarin is more effective when compared with aspirin and reduces the risk of stroke by 35%, although it does confer a small, non-statistically significant increased risk of intracranial haemorrhage.²

Currently, NICE recommends the use of warfarin in patients at high risk of stroke, and aspirin 75-300mg for patients at low risk (see figure 2,p34). For patients at moderate risk of stroke the physician should determine the best treatment on an individual patient basis; this is a difficult area, and should usually involve a discussion with the patient. The NICE guideline states that 'Owing to lack of sufficient clear-cut

evidence, treatment may be decided on an individual basis, and the physician must balance the risks and benefits of warfarin versus aspirin. As stroke risk factors are cumulative, warfarin may, for example, be used in the presence of two or more moderate stroke risk factors. Referral and echocardiography may help in cases of uncertainty.¹⁴

Clearly a patient's risk profile will change with time, and all patients should be reassessed on a regular basis.

Antithrombotic treatment is not limited to patients with permanent or persistent AF. Patients with paroxysmal AF are at a similar risk and should be assessed using the same algorithm.

CONCLUSION

Atrial fibrillation is an increasingly common problem. Many patients will be diagnosed in primary care, either as a result of opportunistic findings or symptomatic presentations. A large proportion of these patients can be investigated and managed using a rate control strategy without the need for specialist referral. A rhythm control treatment strategy is optimal for some patients and they should be referred to a cardiology specialist.

The assessment of stroke risk and the prompt initiation of appropriate antithrombotic treatment is a crucial component of AF management and one that is often overlooked. ●

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Tackling the QOF2 indicators for AF

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How can AF registers be populated?

A There are a number of ways that patients with AF can be added to the register. These vary in the effort required and the speed of results.

First, patients can be added to the register as they present for review or with a new diagnosis of AF.

The NICE guidance¹ recommends manual pulse palpation to assess for an irregular pulse in patients who present with:

- Breathlessness
- Palpitation
- Syncope or dizziness
- Chest discomfort
- Stroke or TIA.

An ECG should be performed in all patients with an irregular pulse, whether they are symptomatic or not, in whom AF is suspected.

Suspected paroxysmal AF should be investigated with ambulatory monitoring. This may require referral to a specialist, depending on the local availability of such investigations.

Second, some practices may have existing computerised disease registers, which may have coding for AF.

Third, since the prevention of stroke is the driving force behind the QOF2 indicators for AF, it is important to identify those most at risk. This may be achieved by targeted screening, using existing disease registers or by reviewing case records (for example for patients aged over 65 years) to identify those with risk factors.

Risk factors include:

- Valve disease
- Heart failure
- History of myocardial infarction
- Hypertension.

An additional strategy could be to identify the prescription of drugs that may be used by those with AF, such as warfarin, digoxin and β -blockers.

Once patients with risk factors or targeted prescriptions are identified, case records can be flagged to indicate the need to check for AF specifically when the patient is next seen. A more proactive approach would be to invite those at high risk for review and possible ECG.

A fourth option is opportunistic screening, taking the opportunity to check for an irregular pulse in every patient, particularly those over 65 years.

Finally, systematic screening could be undertaken; for example, every patient over 65 years could be invited to attend for a pulse check and an ECG. However, this strategy is costly in terms of use of time and resources.

The Health Technology Assessment study² concluded that opportunistic screening was a reasonable and cost-effective strategy compared with systematic screening, and was an improvement on routine practice.

Should patients who have been successfully cardioverted remain on the AF register?

A Yes, patients should remain on the AF register following cardioversion. This should be for at least a year in some cases, but for many patients this should be for life. Following DC cardioversion there is a high recurrence rate of AF, even in cases with an absence of structural heart disease, with more than half of patients being back in AF at one year.

Stroke risk should be considered. Patients with mitral valve disease or heart failure remain at high risk of both recurrent AF and subsequent stroke. These patients should continue on warfarin therapy and be included in the AF register. However, young patients with structurally normal hearts and reversible causes will be at low risk of recurrence or stroke. These patients could be safely removed from the AF register after one year.

NICE recommends that a patient should only be discharged from secondary care after six months if sinus rhythm is maintained.

Should patients who have been successfully ablated remain on the AF register?

A Ablation has the potential for long-term cure in some patients. Patients with paroxysmal AF, without structural heart disease, have a primary electrical problem that can be cured by removing the triggers (by pulmonary vein isolation). These patients may eventually be removed from the AF register.

Patients with persistent AF, particularly if it has been of long duration, such as a year, or those with structural heart disease, have a higher risk of recurrence of AF and should be retained on the register. >>

One factor to consider is that some patients have recurrent AF in the months immediately after ablation, which subsequently settles with the long-term benefit from the ablation.

However, symptomatic benefit may not necessarily mean absence of AF, which can be asymptomatic. In addition, some patients with a technically successful ablation will have subsequent recurrence of AF and require repeat procedures. Finally, new atrial arrhythmia, for example left atrial flutter, may result as a complication of the ablation procedure.

Ablation for AF is a potentially complicated and rapidly changing area, and the electrophysiologist involved in the care of the patient should be able to advise about risk of AF recurrence.

Q Should all practice ECGs for suspected AF be reviewed by a specialist?

A It is not necessary for a specialist to review all ECGs, although when a referral is made the specialist should be sent a copy of the diagnostic ECG, if possible.

The ECG is important because there are other causes of an irregular pulse apart from AF, such as atrial or ventricular premature beats. It is important to establish the correct diagnosis, as a major consideration in AF is the decision as to whether to start warfarin, which may be life-long therapy and carries a small but significant risk of bleeding.

For screening purposes, most modern ECG machines will give computer-generated reports, which are fairly accurate; in particular, if the

Table 1

QOF2 atrial fibrillation indicators

Indicator	Points	Payment stages
Records		
AF 1: The practice can produce a register of patients with atrial fibrillation	5	
Initial diagnosis		
AF 2: The percentage of patients with atrial fibrillation diagnosed after 1 April 2006 with ECG or specialist confirmed diagnosis	10	40-90%
Ongoing management		
AF 3: The percentage of patients with atrial fibrillation who are currently treated with anticoagulation drug therapy or an antiplatelet drug therapy	15	40-90%

report states that it is sinus rhythm it is unlikely that it has missed AF.

However, if there are concerns about the quality of the recording, with obvious noise or artefact, the ECG should be repeated. If the rhythm appears irregular, but there appear to be P waves preceding some QRS complexes, it is advisable to get an informed opinion before making the diagnosis of AF.

Q What would be a reasonable review interval for patients on the AF register?

A The interval will depend on the patient; whether they have paroxysmal, persistent or permanent AF; whether they are being treated for rhythm or rate control; and how successful that treatment is.

Once a patient is stabilised and free from troublesome symptoms they need only infrequent review, if at all. Clearly, patients on warfarin require regular anticoagulation checks.

Q How often should thromboembolic risk be reassessed?

A Thrombotic risk is unlikely to change suddenly, unless the patient suffers an event, such as a myocardial infarction.

Age is a factor, however, and the NICE guidelines indicate that those over 65 years are at higher risk, and those over 75 years have a further increase in risk.

In addition, NICE states that risk stratification should be reconsidered whenever individual risk factors are reviewed. ●

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