**ALGORITHM FOR ORAL ANTICOAGULATION OF PATIENTS WITH NON-VALVULAR ATRIAL FIBRILLATION (AF) TO PREVENT STROKE**

*Specific to the use of oral anticoagulants in the prevention of stroke for people with non-valvular AF. The guidelines are not intended to cover any other aspects of the management of AF. Please refer to the NICE Clinical Guidelines 180 [http://www.nice.org.uk/guidance/CG180](http://www.nice.org.uk/guidance/CG180) for further details on the management of AF.*

**People on warfarin**

**INR Control**

Optimal INR control is defined as TTR≥65%. Factors to consider in improving TTR:

- Patient education
- Adherence to prescribed therapy
- Inconvenient or inappropriate monitoring arrangements – confirm suitability of arrangements for each patient.
- Consider domiciliary monitoring arrangements for patients with reduced mobility
- Cognitive function
- Illness
- Interacting drug therapy
- Lifestyle factors, including diet and alcohol consumption.

For all patients deemed to have failed on warfarin therapy, establish relevant anticoagulant treatment history. Confirm evidence to support proposed reason for treatment failure e.g.

- Failed monitoring arrangements – did the patient attend an anticoagulant monitoring service?
- Labile INR – did the patient achieve a therapeutic INR?
- Bleeding complications – was the bleed major/ minor? Confirm INR at time of bleed.
- Drug interactions – any change to concurrent therapy should be considered.
- Serious ADR – was this documented in patient records?
- Severe alopecia – was the patient offered alternative VKA agents?

**2. Discuss AF, stroke risk and benefits/risks of oral anticoagulant (OAC) treatment options with patient/carer. The following leaflets** **(PILs) are available in the full guidance version to give to patients after discussion:**

**PIL 1** – Information about AF, stroke and bleeding risk and treatment options
- Do **not** offer aspirin monotherapy solely for stroke prevention in people with AF (associated harms outweigh limited benefit)
- Do **not** withhold anticoagulation solely because the person is at risk of having a fall

**PIL 2** – Leaflet outlining differences between major groups of oral anticoagulants

**Anticoagulation**

Patient is suitable for treatment and decides to take an oral anticoagulant

**No anticoagulation**

- CHA2DS2-VASc =0
- Anticoagulant declined/not tolerated/contra-indicated

**3. Decide on choice of OAC**

Tailor choice of OAC to the individual’s clinical characteristics, and personal preferences. AF anticoagulation clinical decision aids is available in the full guidance version.

**4. Assess anticoagulation control with *warfarin** (see page 3)

**5. Communication**

If anticoagulation is initiated in secondary care, communication to GP to include the relevant information on baseline assessments, discussions with patient/carer and provision of patient information (refer to full guidance)

**Reviewing people:**

1. 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.
2. Who are taking an anticoagulant:
   - Review the need for anticoagulation and the quality of anticoagulation at least annually, or more frequently if clinically relevant events occur, affecting anticoagulation or bleeding risk.

**NB:** Regular clinical review of patients on NOACs is very important especially as such patients are likely to be monitored less frequently.
1. Scoring systems to assess risk of stroke and risk of bleed

1.1 CHA$_2$DS$_2$-VASc scoring system for risk of stroke


Risk factor | Score | Present? |
---|---|---|
Congestive heart failure or LVD | 1 | |
Hypertension history (controlled or uncontrolled) | 1 | |
Age 75 years or greater | 2 | |
Age 65–74 years | 1 | |
Diabetes mellitus | 1 | |
Stroke, TIA or thromboembolism | 2 | |
Vascular disease (prior MI, PAD, aortic plaque) | 1 | |
Sex category female | 1 | |

**TOTAL SCORE**

Precise interpretation of stroke risk using the CHA$_2$DS$_2$-VASc score

Friberg L et al. Eur Heart J 2012; 33:1500-10

[http://eurheartj.oxfordjournals.org/content/33/12/1500](http://eurheartj.oxfordjournals.org/content/33/12/1500)

<table>
<thead>
<tr>
<th>CHA$_2$DS$_2$-VASc score</th>
<th>Events per 100 patients/year</th>
<th>Events per 1000 patients/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stroke/TIA/ peripheral emboli</td>
<td>Ischaemic stroke</td>
<td>Ischaemic Stroke</td>
</tr>
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</tr>
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</tr>
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<td>2.5</td>
</tr>
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<tr>
<td>7</td>
<td>18.4</td>
<td>13.1</td>
</tr>
</tbody>
</table>

1.2 HASBLED scoring system for risk of bleed


Risk factor | Score | Present? |
---|---|---|
Hypertension (uncontrolled eg systolic > 160mmHg, unresponsive to antihypertensives) | 1 | |
Abnormal liver function (cirrhosis; bilirubin >2xnormal in association with AST/ALT/ALP >3x normal) | 1 | |
Abnormal renal function (dialysis, transplant, Cr>2.3mg/dl or > 200 umol/l) | 1 | |
Stroke (prior history) | 1 | |
Bleeding (anaemia or predisposition to bleeding) | 1 | |
Labile INR (refers to unstable INRs/ high INRs or poor time in therapeutic range (e.g. TTR<60%)). | 1 | |
Elderly (Age ≥65yrs, frail) | 1 | |
Drugs (usage predisposing to bleeding eg anti-platelets, NSAIDs) | 1 | |
Alcohol (consumption of 8 or more alcoholic drinks per week) | 1 | |

**TOTAL SCORE**

Precise interpretation of bleeding risk using the HAS-BLED score

Friberg et al, Eur Heart J 2012; 33:1500–10

[http://eurheartj.oxfordjournals.org/content/33/12/1500](http://eurheartj.oxfordjournals.org/content/33/12/1500)

<table>
<thead>
<tr>
<th>HAS-BLED score</th>
<th>Major bleeding events per 100 patients/year</th>
<th>Major bleeding events per 1000 patients/year</th>
</tr>
</thead>
<tbody>
<tr>
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<td>–</td>
<td>–</td>
</tr>
<tr>
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<td>7</td>
</tr>
<tr>
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<td>57</td>
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</tbody>
</table>

* Please note that online scoring calculators have not yet been updated to reflect ESC 2014 guidance upon which NICE CG180 is based. There may be slight variation in management advice.

Friberg L et. al. Eur Heart J 2012; 33:1500-10

[http://eurheartj.oxfordjournals.org/content/33/12/1500](http://eurheartj.oxfordjournals.org/content/33/12/1500)

**Interpretation of stroke risk using the CHA$_2$DS$_2$-VASc score**

Friberg L et. al. Eur Heart J 2012; 33:1500-10

[http://eurheartj.oxfordjournals.org/content/33/12/1500](http://eurheartj.oxfordjournals.org/content/33/12/1500)

**Interpretation of bleeding risk using the HAS-BLED score**

Friberg et al, Eur Heart J 2012; 33:1500–10

[http://eurheartj.oxfordjournals.org/content/33/12/1500](http://eurheartj.oxfordjournals.org/content/33/12/1500)
2. Discussing risks and benefits of anticoagulation (NICE CG 180)

Explain to 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.

The Patient Information Leaflets (PILs) in the full guidance version may be used to explain to patient/carer the treatments options and the risks and benefits of each option so that the decision for treatment is shared with the patient/carer.

The leaflets are adapted from the patient decision aid (PDA) tool on NICE website http://guidance.nice.org.uk/CG180/PatientDecisionAid/pdf/English and are intended to support clinicians to make the patient/carer understand their personal risk of stroke and bleeding and the impact of anticoagulation i.e. what matters most to the patient/carer to come to an informed decision taking into account their personal preferences. It is recommended that this is undertaken over 2 or more consultations with the patient/carer to absorb the information.

Clinicians are encouraged to use these leaflets to ensure that patients/carers own the decision. NICE has also developed a user guide for the PDA. It provides the background to and the scope of the PDA and also states the sources of data, methods and limitations. This is available on http://www.nice.org.uk/guidance/cg180/resources/cg180-atrial-fibrillation-update-patient-decision-aid-user-guide2

3. Choice of oral anticoagulation

NICE CG 180 states: “Anticoagulation may be with vitamin K antagonist (warfarin) or non-vitamin K oral anticoagulants (apixaban, dabigatran etexilate, rivaroxaban)“.

Patients with non-valvular atrial fibrillation not on OAC (newly diagnosed/treated)

3.1 Warfarin is the only option in:
- Patients with CrCl < 15ml/min or other absolute contraindications to NOAC. Note that:
  - Dabigatran is contra-indicated at CrCl ≤30ml/min
  - Rivaroxaban is contra-indicated at CrCl ≤15ml/min, AND rivaroxaban dose should be reduced to 15mg once daily at CrCl 15-49 ml/min
  - Apixaban is contra-indicated at CrCl ≤15ml/min AND apixaban dose should be reduced in patients with at least two of the following: age ≥80 years, body weight ≤60 kg, or serum creatinine ≥1.5 mg/dl (133 micromol/l).
- Patients with metallic heart valves, prior valve surgery or mitral stenosis – the treatment of patients with valvular atrial fibrillation is outside the scope of this guideline.

3.2 For all other patients, tailor the choice of anticoagulant to individual patient’s clinical characteristics, values and preferences.
- For patients – Refer to appendix 2: PIL 2 in full guidance version for leaflet outlining differences between major groups of oral anticoagulants
- For healthcare professionals, the key points outlined in the table below or refer to appendix 3 in full guidance:

<table>
<thead>
<tr>
<th>Warfarin</th>
<th>NOACs</th>
</tr>
</thead>
<tbody>
<tr>
<td>INR monitoring required. INR gives clinicians a guide to patient compliance.</td>
<td>No requirement for anticoagulation monitoring.</td>
</tr>
<tr>
<td>Oral antidote (vitamin K) to reverse effects of warfarin on INR.</td>
<td>Difficult to monitor compliance.</td>
</tr>
<tr>
<td>Warfarin is known to interact with certain foods containing high amounts of vitamin K. This is only a problem if patients make major changes in diet.</td>
<td>No published systematic clinical studies on the reversal of the anticoagulant effects of the drugs.</td>
</tr>
<tr>
<td></td>
<td>NOACs currently have no known food interactions.</td>
</tr>
</tbody>
</table>

4. Assessing anticoagulation control with warfarin

4.1 Calculate the person’s time in therapeutic range (TTR) at each visit. When calculating TTR:
- Use a validated measurement method
- Exclude measurements taken during the first 6 weeks of treatment
- Calculate TTR over a maintenance period of at least 6 months

4.2 Reassess anticoagulation for a person with poor anticoagulation control 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%

4.3 When reassessing, take into account and if possible address the factor that may contribute to poor control:
- Patient education
- Cognitive function
- Adherence to prescribed therapy
- Illness
- Interacting drugs
- Lifestyle factors including diet and alcohol
- Inconvenient/inappropriate monitoring arrangements – confirm suitability
- Consider domiciliary monitoring arrangements for patient with reduced mobility

4.4 If poor INR control cannot be improved, evaluate the risks and benefits of alternative stroke prevention strategies and discuss this with the patient.