SIGN GUIDELINES 152: CARDIAC ARRHYTHMIAS IN CORONARY HEART DISEASE

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Declaration of interests

- **Speakers fees / advisory boards**
  - Daiichi Sankyo, BMS/Pfizer, Boehringer Ingelheim, Bayer

- **Sponsorship (conference attendance)**
  - BMS/Pfizer, Boehringer Ingelheim, St Jude Medical / Abbott

- **Research funding**
  - St Jude Medical / Abbott, Boston Scientific
# THE GUIDELINE DEVELOPMENT GROUP

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<thead>
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SIGN Guidelines: the process

- Update on previous guidelines (2007)
- 6 new chapters published over last 2 years
  - Heart failure
  - ACS
  - Risk estimation & CV disease prevention
  - Cardiac rehabilitation
  - Stable angina
  - Arrhythmias
Key questions

- **KQ1** - In adults who have sustained a cardiac arrest does therapeutic hypothermia offer benefits over usual care?
- **KQ2** - What antiarrhythmic drugs are useful in treating patients with haemodynamically stable ventricular tachycardia (VT) and coronary heart disease?
- **KQ3** - What are the clinical effectiveness, cost effectiveness and safety of dronedarone in patients with CHD and atrial fibrillation (AF)?
Key questions

- KQ4 - What are the benefits and harms of strict versus lenient rate control in patients with atrial fibrillation?
- KQ5 - What are the clinical effectiveness, cost effectiveness and safety of catheter ablation for patients with atrial fibrillation
- KQ6 - What are the clinical effectiveness, cost effectiveness and safety of ablation for patients with atrial flutter?
Key questions

- KQ7 - What evidence is there that programming ICD/CRT-D devices leads to a reduction in inappropriate shocks and better patient outcomes?
- KQ8 - What is the clinical effectiveness and safety of catheter ablation for VT/electrical storm?
- KQ9 - What are the clinical effectiveness, cost effectiveness and safety of treatment with the NOACs in patients experiencing atrial fibrillation after coronary artery bypass surgery?
Key questions

- **KQ10** - What is the clinical effectiveness, cost effectiveness and safety of surgical ablation for atrial fibrillation in patients who are undergoing cardiac surgical procedures?
- **Key question 11**: In patients with arrhythmias do psychosocial interventions reduce the use of hospital resources/readmissions?
<table>
<thead>
<tr>
<th>LEVELS OF EVIDENCE</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1**</td>
<td>High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>1*</td>
<td>Well-conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias</td>
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<tr>
<td>1</td>
<td>Meta-analyses, systematic reviews, or RCTs with a high risk of bias</td>
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<tr>
<td>2**</td>
<td>High-quality systematic reviews of case-control or cohort studies</td>
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<td></td>
<td>High-quality case-control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal</td>
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<tr>
<td>2*</td>
<td>Well-conducted case-control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal</td>
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<td>2</td>
<td>Case-control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal</td>
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<tr>
<td>3</td>
<td>Non-analytic studies, eg case reports, case series</td>
</tr>
<tr>
<td>4</td>
<td>Expert opinion</td>
</tr>
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</table>
RECOMMENDATIONS

Some recommendations can be made with more certainty than others. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the ‘strength’ of the recommendation).

The ‘strength’ of a recommendation takes into account the quality (level) of the evidence. Although higher-quality evidence is more likely to be associated with strong recommendations than lower-quality evidence, a particular level of quality does not automatically lead to a particular strength of recommendation.

Other factors that are taken into account when forming recommendations include: relevance to the NHS in Scotland; applicability of published evidence to the target population; consistency of the body of evidence, and the balance of benefits and harms of the options.

R  For ‘strong’ recommendations on interventions that ‘should’ be used, the guideline development group is confident that, for the vast majority of people, the intervention (or interventions) will do more good than harm. For ‘strong’ recommendations on interventions that ‘should not’ be used, the guideline development group is confident that, for the vast majority of people, the intervention (or interventions) will do more harm than good.

R  For ‘conditional’ recommendations on interventions that should be ‘considered’, the guideline development group is confident that the intervention will do more good than harm for most patients. The choice of intervention is therefore more likely to vary depending on a person’s values and preferences, and so the healthcare professional should spend more time discussing the options with the patient.

GOOD-PRACTICE POINTS

✓ Recommended best practice based on the clinical experience of the guideline development group.

NICE has accredited the process used by Scottish Intercollegiate Guidelines Network to produce clinical guidelines. The accreditation term is valid until 31 March 2020 and is applicable to guidance produced using the processes described in SIGN 50: a guideline developer’s handbook, 2015 edition (www.sign.ac.uk/guidelines/fulltext/50/index.html). More information on accreditation can be viewed at www.nice.org.uk/accreditation
SIGN 152 • Cardiac arrhythmias in coronary heart disease
A national clinical guideline
September 2018

HRC 2018 Talks

MBE, Trudie Lobban

26th September 2018

26th September 19??8
MBE, Trudie Lobban

HRC 2018 Talks

26th September 2018

26th September 1988
SIGN Guidelines 152

- **Something Old**
  - Recommendations unchanged since 2007
    - e.g. treatment of bradycardia

- **Something New**
  - Several new recommendations
    - AF rate control, ablation ICD programming, etc

- **Something Borrowed**
  - From other guidelines e.g. Resuscitation Council, NICE ICDs

- **Something Blue**
  - Cyanosis? Amiodarone? Depression?
  - Hypothermia post cardiac arrest …
Recommendation 3.4.3: Therapeutic hypothermia after cardiac arrest

- Two “positive” trials in 2002
- Since then, 14 systematic reviews or meta-analyses
- 2 recent reviews considered in detail
  - Meta-analysis of pre-hospital cooling
  - Cochrane review of pre-hospital and in-hospital cooling
- Pre-hospital cooling had
  - No effect on mortality
  - Higher incidence of recurrent cardiac arrest
Recommendation 3.4.3: Therapeutic hypothermia after cardiac arrest

- Cochrane review: 5 RCTs of in-hospital therapeutic hypothermia, 1 RCT of pre-hospital therapeutic hypothermia
  - Heterogeneity ++
  - Pooled results showed better neurological outcome
    - But this was based on pooled results of small trials from 15 years ago
  - Largest single RCT of 939 patients: No difference

- **Recommendation:** Therapeutic hypothermia should not routinely be administered to patients in the prehospital or in-hospital setting after cardiac arrest
  - There may be benefit from targeted temperature management
Arrhythmias associated with chronic coronary heart disease / LV dysfunction
Atrial fibrillation

- Obesity and a sedentary lifestyle are important modifiable risk factors for atrial fibrillation. In one RCT, 150 overweight and obese patients with symptomatic atrial fibrillation were randomly assigned to an intensive weight management strategy (intervention group) or general lifestyle advice (control). The mean weight loss achieved in the intervention group was superior to that in the control group (14.3 kg v 3.6 kg, p<0.01), and this was associated with a reduction in atrial fibrillation symptom burden and severity, and also in beneficial cardiac remodelling.

- Non-randomised studies from the same investigators have reported that long-term sustained weight loss is associated with significant reduction of AF burden and maintenance of sinus rhythm.

- In patients undergoing catheter ablation for atrial fibrillation, aggressive risk factor management improves the long-term success of AF ablation.
Atrial fibrillation

- Amiodarone or sotalol treatment should be considered where prevention of atrial fibrillation recurrence is required on symptomatic grounds.

- Dronedarone should be considered for prevention of atrial fibrillation recurrence in patients who are unable to tolerate, or who have failed to respond to amiodarone or sotalol and who do not have left ventricular systolic dysfunction or heart failure.
  
  - Monitor LFTs on Dronedarone
  - ECG at least every six months to exclude permanent AF.
  - Evaluate for symptoms of heart failure, monitor for the development of LVSD.
Atrial fibrillation – Rate control

- Rate control is the recommended strategy for management of patients with well-tolerated atrial fibrillation.
- In patients with permanent AF or persistent AF following a rate-control strategy and a resting heart rate $>110$ bpm, appropriate rate-control therapy should be instituted with an initial target of resting heart rate $<110$ bpm.
- Ablation and pacing should be considered for patients with AF who remain severely symptomatic or have LV dysfunction in association with poor rate control or intolerance to rate-control medication.

AF ablation in heart failure – CASTLE-AF trial

CASTLE-AF: Subgroup Analyses of the Primary End Point.
Atrial fibrillation - ablation

- Patients with highly symptomatic paroxysmal atrial fibrillation resistant to one or more antiarrhythmic drugs and little or no comorbidity should be referred to an arrhythmia specialist for consideration of ablation.
- Patients with symptomatic atrial fibrillation (paroxysmal or persistent), symptomatic heart failure and left ventricular systolic dysfunction with a left ventricular ejection fraction of 25–35% should be referred to an arrhythmia specialist for consideration of ablation.
- Catheter ablation techniques for atrial fibrillation should focus on electrical isolation of the pulmonary veins.
- An early ablation strategy should be considered for highly symptomatic patients with little or no comorbidity.
- Any patient with highly symptomatic persistent atrial fibrillation should be referred to an arrhythmia specialist and ablation may be useful in selected cases.
- Patients who present with typical atrial flutter should be offered radiofrequency catheter ablation.
ICDs and CRT

- Unchanged from SIGN 147 (heart failure)
  - adapted from NICE guidelines
- No new “key question” on device indications in arrhythmia chapter

<table>
<thead>
<tr>
<th>QRS interval (ms)</th>
<th>NYHA class</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;120</td>
<td>ICD if there is a high risk of sudden cardiac death</td>
<td>ICD and CRT not clinically indicated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120–149 (without LBBB)</td>
<td>ICD</td>
<td>ICD</td>
<td>ICD</td>
<td>CRT-P</td>
<td></td>
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<tr>
<td>120–149 (with LBBB)</td>
<td>ICD</td>
<td>CRT-D</td>
<td>CRT-P or CRT-D</td>
<td>CRT-P</td>
<td></td>
</tr>
<tr>
<td>≥150 (with or without LBBB)</td>
<td>CRT-D</td>
<td>CRT-D</td>
<td>CRT-P or CRT-D</td>
<td>CRT-P</td>
<td></td>
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ICD = implantable cardioverter defibrillator; CRT-D = cardiac resynchronisation therapy with an implantable cardioverter defibrillator; CRT-P = cardiac resynchronisation therapy with pacing

- Implantable cardioverter defibrillators, cardiac resynchronisation therapy with defibrillator or cardiac resynchronisation therapy with pacing are recommended as treatment options for patients with heart failure with reduced ejection fraction, LVEF ≤35%, as specified in Table 1.

- Patients receiving cardiac resynchronisation therapy and/or an implantable cardioverter defibrillator should be offered pre- and postplacement counselling, including discussion of potential shocks from the device, and device deactivation.
<table>
<thead>
<tr>
<th>MADIT-RIT A</th>
<th>MADIT-RIT B</th>
<th>MADIT-RIT C</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Standard Programming derived from MADIT II)</td>
<td>(High rate cutoff)</td>
<td>(Long delay + Rhythm ID)</td>
</tr>
<tr>
<td>Zone 1 (VT):</td>
<td>Zone 1 (VT):</td>
<td>Zone 1 (VT-1):</td>
</tr>
<tr>
<td>– 170 bpm, 2.5s delay</td>
<td>– 170 bpm</td>
<td>– 170 bpm, 60s delay</td>
</tr>
<tr>
<td>– Onset/stability detection enhancements ON</td>
<td>– Monitor only</td>
<td>– Rhythm ID detection enhancements ON</td>
</tr>
<tr>
<td>– ATP + Shock</td>
<td></td>
<td>– ATP + Shock</td>
</tr>
<tr>
<td>Zone 2 (VF):</td>
<td>Zone 2 (VF):</td>
<td>Zone 2 (VT):</td>
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<tr>
<td>– 200 bpm, 1s delay</td>
<td>– 200 bpm, 2.5s delay</td>
<td>– 200 bpm, 12s delay</td>
</tr>
<tr>
<td>– Quick Convert ATP</td>
<td>– Quick Convert ATP</td>
<td>– Rhythm ID detection enhancements ON</td>
</tr>
</tbody>
</table>

MADIT-RIT – 1° endpoint (1st inappropriate Rx)
MADIT-RIT – 2° endpoint (all-cause mortality)
ICDs – Reducing inappropriate shocks

- Patients with a primary-prevention ICD should have a single therapy zone programmed at a detection rate of 200 bpm.
- Consider extending detection intervals in patients with secondary-prevention ICDs.
One small RCT recruited 74 participants with wide QRS complex monomorphic tachycardias, of whom data could be analysed in 62. Intravenous procainamide was more effective than IV amiodarone in terminating wide complex tachycardia (22 of 33 participants, (67%) v 11 of 29 participants (38%), respectively; p=0.026).

Intravenous procainamide and sotalol are no longer available as licenced products in the UK.

Intravenous amiodarone should be considered in the management of patients with haemodynamically stable sustained monomorphic VT.
VT ablation
VT – Catheter ablation for recurrent VT / electrical storm

- In the largest systematic review * of 38 case series, involving 447 patients undergoing invasive management, any inducible VA was successfully ablated in 72% of cases (95% CI 71% to 89%) and clinical VA was ablated in 91% of cases (95% CI 90% to 97%).

- **Catheter ablation should be considered in patients with electrical storm, where maximal medical therapy and appropriate ICD reprogramming have failed to control the arrhythmia**

Arrhythmias Associated with Coronary Artery Bypass Grafting
Arrhythmias post CABG

- In the immediate postoperative period, patients with persistent AF should be treated with a rhythm-control strategy.
- No evidence was identified about the clinical effectiveness, cost effectiveness or safety of treatment with the direct oral anticoagulants in patients experiencing atrial fibrillation after CABG.
- Anticoagulation should be considered on a case by case basis for patients with AF following CABG where it is anticipated that the AF is likely to persist.
Surgical Ablation

- Patients who are referred for cardiac surgery and who have a history of atrial fibrillation (paroxysmal or persistent) should routinely be considered for surgical ablation as a concomitant procedure.
- Surgical ablation should involve electrical isolation of the pulmonary veins with or without other lesions.
- The decision as to whether or not to perform concomitant AF ablation should be discussed with the patient prior to cardiac surgery.
- In patients who have undergone surgical ablation and are clinically free of atrial arrhythmias postoperatively, the decision on whether or not to discontinue antithrombotic therapy should take into account the patient’s CHA2DS2-VASc score and the risk of stroke if the patient were to develop recurrent AF.
Psychosocial issues

- Psychosocial implications for people experiencing cardiac arrhythmias should be considered by all healthcare staff throughout assessment, treatment and care.
- Psychosocial support for patients experiencing cardiac arrhythmias should not be restricted to recipients of ICDs.
- Psychosocial interventions offered as part of a comprehensive rehabilitation programme should encompass a cognitive behavioural component.
- Antidepressant medication: Caution should be exercised in prescription of drugs which may prolong the QT interval, particularly in older patients (aged 65 years or above)
2 Key recommendations

The following recommendations were highlighted by the guideline development group as the key clinical recommendations that should be prioritised for implementation.

2.1 ARRHYTHMIAS ASSOCIATED WITH CARDIAC ARREST

R Efforts to prevent sudden cardiac death should include:
- risk factor intervention in those individuals who are at high risk for coronary heart disease
- health promotion measures and encouragement of moderate intensity physical activity in the general population.

2.2 ARRHYTHMIAS ASSOCIATED WITH ACUTE CORONARY SYNDROME

R All patients with ST-elevation acute coronary syndrome should undergo assessment of LV function for risk stratification at least six weeks following the acute event.

2.3 ARRHYTHMIAS ASSOCIATED WITH CHRONIC CORONARY HEART DISEASE/LEFT VENTRICULAR DYSFUNCTION

R Rate control is the recommended strategy for management of patients with well tolerated atrial fibrillation.

R In patients with permanent AF or persistent AF following a rate control strategy and a resting heart rate >110 bpm, appropriate rate-control therapy should be instituted with an initial target of resting heart rate <110 bpm.

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