



Government of **Western Australia**
Department of **Health**

Quick reference guide: Atrial Fibrillation Information for the Health Practitioner

**Cardiovascular Health Network and the
Neuroscience and the Senses Health Network**

Prepared by the Atrial Fibrillation Working Group
Endorsed by the Chief Medical Officer

August 2014

© Department of Health, State of Western Australia (2014).

Copyright to this material produced by the Western Australian Department of Health belongs to the State of Western Australia, under the provisions of the Copyright Act 1968 (C'wth Australia). Apart from any fair dealing for personal, academic, research or non-commercial use, no part may be reproduced without written permission of the Health Strategy and Networks, Western Australian Department of Health. The Department of Health is under no obligation to grant this permission. Please acknowledge the WA Department of Health when reproducing or quoting material from this source.

Suggested Citation

Department of Health, Western Australia. Quick reference guide: Atrial Fibrillation Information for the Health Practitioner. Perth: Health Strategy and Networks, Department of Health, Western Australia; 2014.

Important Disclaimer

All information and content in this Material is provided in good faith by the WA Department of Health, and is based on sources believed to be reliable and accurate at the time of development. The State of Western Australia, the WA Department of Health and their respective officers, employees and agents, do not accept legal liability or responsibility for the Material, or any consequences arising from its use.

Document review due

Number	Date	For Review
1	March 2011	March 2013
2	July 2014	July 2016
3		July 2018

Contents

Contents	1
Atrial Fibrillation – Information	1
Atrial Fibrillation – Management Principles	2
Algorithm A – Stroke Risk Stratification and Antithrombotic Therapy	4
Algorithm B – Atrial Fibrillation Management Cascade	7
Algorithm C – DC Cardioversion Guidelines	8
Atrial Fibrillation – Frequently Asked Questions (FAQs)	1
References	2
Glossary of Abbreviations	3
Appendices	4
Appendix 1: Contacts	4
Appendix 2: Atrial Fibrillation Guidelines, Patient Information and AF Working Group	5
Appendix 3: AF Working Groups	6

Index of tables

Table 1: AF as a progressive condition	1
Table 2: CHA ₂ DS ₂ -VASc, a more precise stroke risk calculator	5
Table 3: HAS-BLED Bleeding Risk Score	6

Atrial Fibrillation – Information

Definition

Atrial Fibrillation (AF) is an atrial tachyarrhythmia characterised by chaotic atrial electrical activity and rapid, irregular and uncoordinated contraction of the atria. This leads to a loss of atrial mechanical function with increased risk of progressive atrial chamber dilatation and cardiac thromboembolism. AF results in an irregular and usually rapid heart rate if untreated.

Why worry about AF?

- AF is the most common sustained cardiac arrhythmia seen in clinical practice.
- It is associated with increased morbidity, mortality and preventable stroke (AF is associated with a five-fold increased risk of stroke).
- The incidence and prevalence increase with age; lifetime risk of developing AF is one in four for those aged 40 years and older.^{1,2,3}

Patterns of AF 3,6

AF is a chronically progressive disease and, as such, rhythm control strategies should be undertaken at the earliest possible stage.

Table 1: AF as a progressive condition

Paroxysmal	Persistent	Long –standing Persistent	Permanent AF
Intermittent AF reverting spontaneously to sinus rhythm within 7 days (usually within 48 hrs) probability of reverting after 48hrs.	AF > 7 days or requires electrical or pharmacological termination.	AF longer than one year	Permanent presence of AF is accepted by the patient and physician.



Clinical Assessment:

- Manual pulse check.
- ECG is mandatory to confirm rhythm, assess rate, and identify other pathologies including cardiac ischaemia, left ventricular hypertrophy or pre-excitation. Patient history and physical examination; in particular, assess for haemodynamic compromise, heart failure and cardiac ischaemia.
- Stroke risk assessment (see Algorithm A).
- Blood Tests: renal, hepatic, thyroid (exclude hyperthyroidism), clotting factors (baseline), electrolytes, BSL (exclude diabetes), full blood count (exclude anaemia).
- Consider AF in relation to the patient's overall cardiovascular risk.

- Echocardiogram recommended especially in patients with symptomatic AF, known or suspected heart disease or cardiac risk factors to assess cardiac function and detect structural abnormalities.³
- Refer to an Emergency Department or Specialist when necessary.

Atrial Fibrillation – Management Principles

Management Priorities (SO - AF):

Stroke prevention – consider antithrombotic therapy to reduce the risk of systemic thromboembolism that can lead to stroke and death

See
Algorithm A

Rate Or Rhythm control – strategy in the long-term

Assess and relieve symptoms – this is usually obtained by rate control in the short-term

See
Algorithm B

Factors – treat associated or causative factors; may abort the arrhythmia

Note that interim rate control is still necessary for most patients in whom a rhythm control strategy is chosen. Depending on the patient's response, the strategy initially chosen may be unsuccessful in which case the alternative strategy is adopted.

Regardless of whether a rate or rhythm control strategy is used, attention to antithrombotic therapy to prevent thromboembolism is essential.

Consider referral:

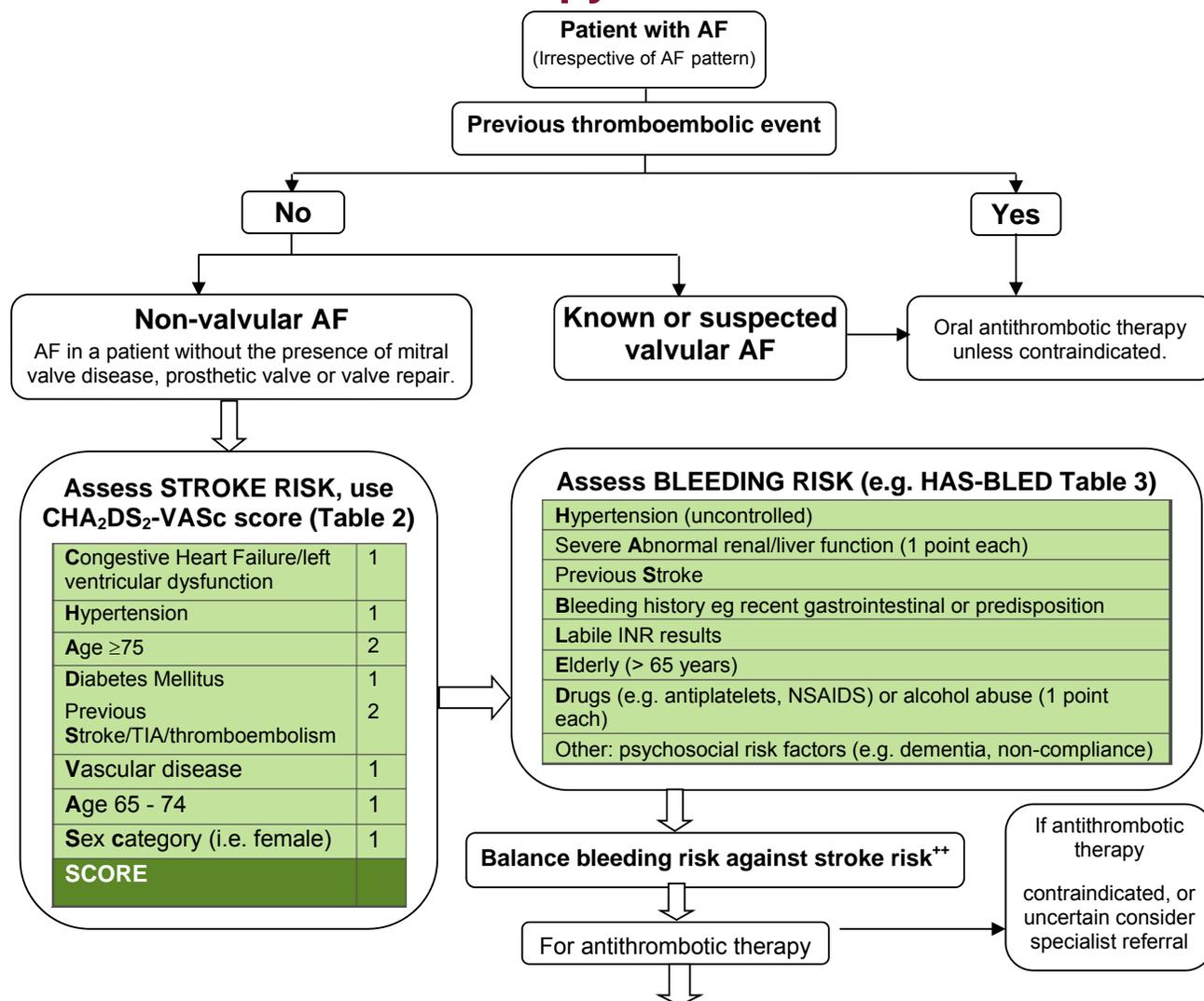
- First episode of AF of less than 48 hours duration refer to local ED for possible cardioversion.
- Symptomatic patient.
- Underlying or suspected cardiovascular disease.
- Management difficulties.
- Requires antiarrhythmic treatment.
- Antithrombotic treatment is problematic or contraindicated.
- Refer all patients with atrial flutter as catheter ablation is often the most effective initial treatment.

Follow Up:

- Regular follow-up – review the patient at least annually.
- Reassess AF pattern – has it changed?
- Reassess antithrombotic need – have indications for antithrombotic treatment changed?
- Risk profile assessment – e.g. new diabetes or hypertension.
- Review current therapy effectiveness – symptoms, heart rate and side-effects of antiarrhythmic medications (look for QT prolongation).
- Patient education – including cardiovascular risk factors and antithrombotic therapy.
- Provide patients with a structured care plan for follow up and management of AF.

- 12 lead ECG, biochemistry, other investigations as indicated.
- Holter monitoring may be indicated if unsure of treatment response to rate or rhythm control.
- Consider exercise testing to assess effective ventricular rate control in younger, active patients.

Algorithm A – Stroke Risk Stratification and Antithrombotic Therapy



Use CHA₂DS₂-VASc score and bleeding risk assessment to determine antithrombotic therapy

CHA ₂ DS ₂ -VASc Score	Stroke Risk Category	Recommended Antithrombotic Therapy
0	No risk factors	No antithrombotic therapy or aspirin only.
1	One clinically relevant non-major risk factor	Evidence of treatment limited in this group. Options include no antithrombotic treatment, aspirin 75 -300mg daily or oral anticoagulant (OAC). Aspirin or OAC is unlikely to have a net clinical benefit unless HAS-BLED score is low. See page 6,7
≥ 2	One major risk factor or ≥2 clinically relevant non-major risk factors	New OAC is preferred to warfarin ^{4,6} . If using warfarin, target INR 2.5 (range 2-3*). Use low molecular weight (LMW) heparin when commencing warfarin until INR is therapeutic. ^{**} If HAS-BLED ≥3, consider referral to a cardiologist.

*↑ Embolic risk if INR < 2.0 and ↑ risk of bleeding with high INR.

Reassess thromboembolic risk and need for antithrombotic therapy at least annually

Table 2: CHA2DS2-VASc, a more precise stroke risk calculator

Major Stroke Risk Factors	Clinically relevant non-major stroke risk factors	
Previous stroke, transient ischaemic attack (TIA), or systemic embolism	Heart failure	
Age \geq 75 years	Moderate to severe LV systolic dysfunction (LV EF < 40%)	
	Hypertension and /or Diabetes mellitus	
	Female sex and/ or Age 65–74 years	
	Vascular disease	
Letter	Risk Factor	Score
C	<u>C</u> ongestive heart failure/ left ventricular dysfunction	1
H	<u>H</u> ypertension	1
A	<u>A</u> ge \geq 75	2
D	<u>D</u> ialabetes mellitus	1
S	Previous <u>S</u> troke/ TIA/ thromboembolism.	2
V	<u>V</u> ascular disease (eg. prior myocardial infarction, peripheral artery disease, or aortic plaque)	1
A	<u>A</u> ge 65–74	1
Sc	<u>S</u> ex <u>c</u> ategory (i.e. female sex)	1
Note: maximum score is 9 since age may contribute 0, 1, or 2 points		9

Adapted from Camm, Kirchoff et al, 2010³

Annual Stroke Risk Based on CHA₂DS₂-VASC scoring system⁴

The expected stroke risk rate is:

- 0.0%/yr in those people with a CHA2DS2-VASC of 0
- 1.3%/yr with score of 1
- 2.2%/yr or higher with score of 2 or more

CHA2DS2-VASc score=1: Due to the lack of clinical trial evidence for preferred antithrombotic treatment in patients with a CHA2DS2-VASc score of 1, the 2014 ACC/AHA/HRS guidelines⁶ recommend that no antithrombotic therapy or treatment with an OAC or aspirin may be considered in these patients. Further, female patients who are aged <65 years with lone AF will have a CHA2DS2-VASc score of 1 by virtue of their gender. They are generally at low risk and the option of no antithrombotic therapy should be considered⁴.

Treatment recommendations should always be based on an informed discussion with the patient taking into account the likely net clinical benefit of antithrombotic treatment.

Table 3: HAS-BLED Bleeding Risk Score

The HAS-BLED (hypertension, abnormal renal/liver function, previous stroke/transient ischaemic attack (TSI), bleeding history or predisposition, labile INR, elderly >65 years, drugs/alcohol concomitantly) tool was developed to provide a risk score to estimate the 1-year risk for major bleeding ⁷.

Letter	Clinical Characteristic	Points Awarded
H	Hypertension (defined as SBP > 160 mmHg)	1
A	Abnormal renal and liver function (1 point each)*	1 or 2
S	Previous Stroke	1
B	Bleeding history or predisposition	1
L	Labile INR results	1
E	Elderly (>65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Max 9 points

*'Abnormal kidney function' is defined as the presence of chronic dialysis or renal transplantation or serum creatinine $\geq 200\mu\text{mol/L}$.

'Abnormal liver function' is defined as chronic hepatic disease (e.g. cirrhosis) or biochemical evidence of significant hepatic derangement (e.g. bilirubin >2 times ULN, in association with AST/ALT/Alkaline phosphatase > 3 times ULM).

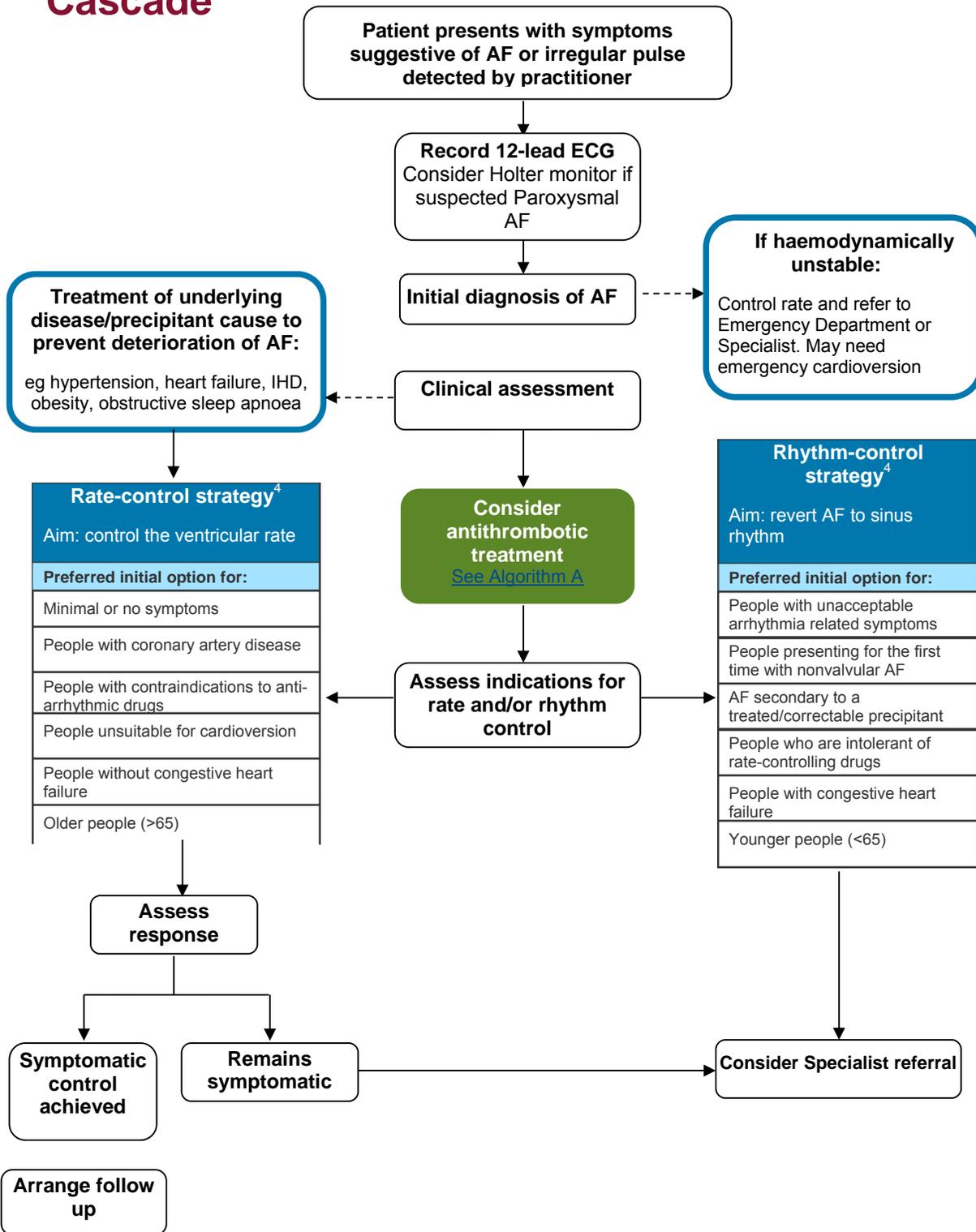
The European Society of Cardiology (ESC) 2010 Atrial Fibrillation guidelines suggest a HAS-BLED score of ≥ 3 indicates a high bleeding risk. Caution and regular monitoring would be required in any use of antithrombotic therapy in such an AF patient ^{3,7}.

Score	Bleeding risk calculation (% bleeds per 100 patient-years)
0-1	Low risk (1.1%)
2	Intermediate risk (1.9%)
≥ 3	High risk (4.9%)

If $\text{CHA}_2\text{DS}_2\text{-VASc}$ score ≥ 2 with a HAS-BLED score ≥ 3 , consider referral to cardiologist.

If $\text{CHA}_2\text{DS}_2\text{-VASc}$ score is 1 with a HAS-BLED score ≥ 2 , antithrombotic therapy may not be warranted as bleeding risk may exceed thromboembolic risk. Risk-benefit should be discussed. If uncertain discuss with a cardiologist.

Algorithm B – Atrial Fibrillation Management Cascade

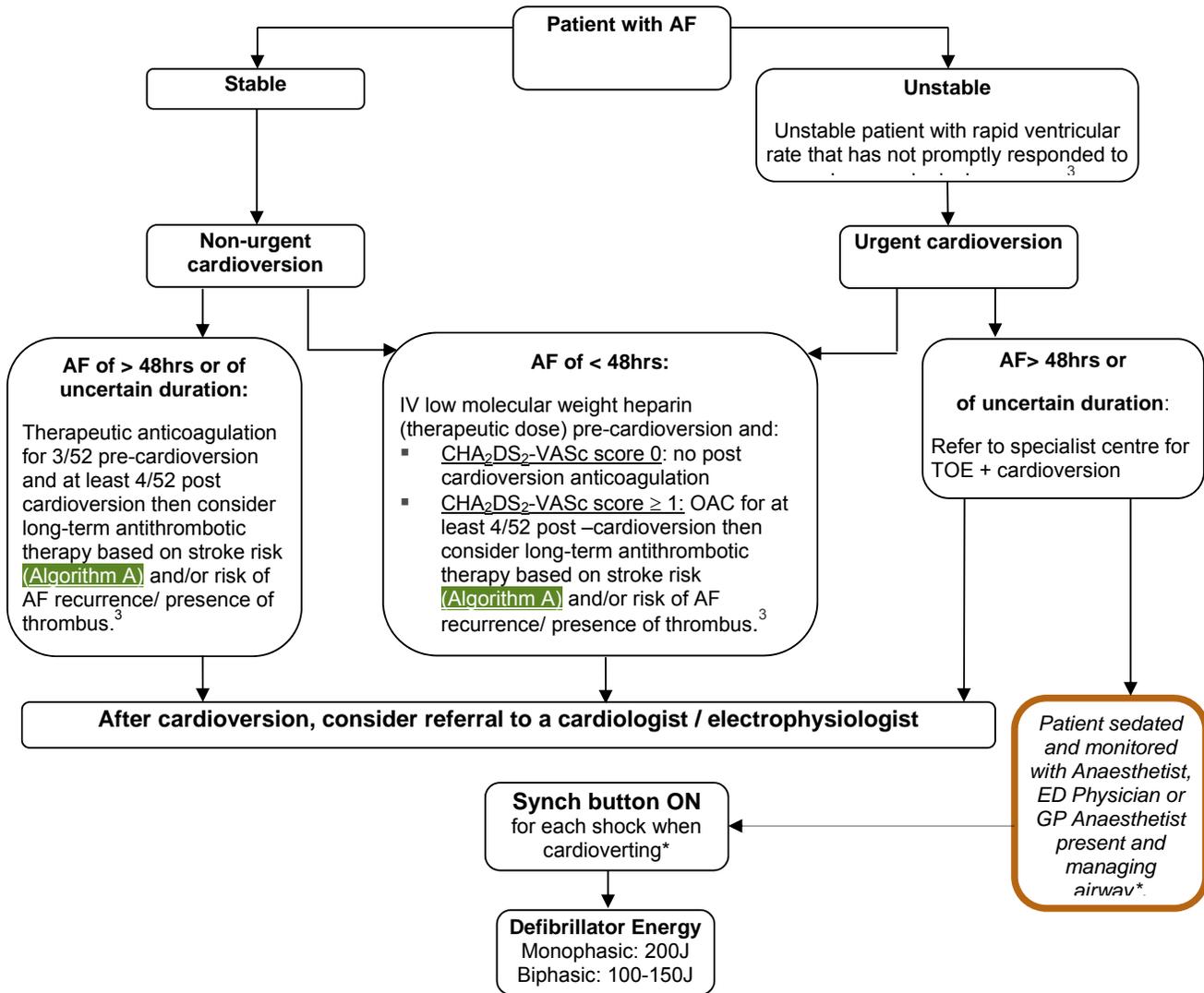


Note:

- **Rate control:** Use β -blockers or rate-slowing calcium channel blockers.
- Note that digoxin is effective at controlling heart rate at rest but not during exercise, use only in sedentary patients, digoxin has a secondary role in patients with congestive heart failure.¹
- **Rhythm control:** Use amiodarone, sotalol or flecainide only after expert advice.

Algorithm C – DC Cardioversion Guidelines

Consider cardioversion in highly symptomatic patients when other therapy has failed
 Cardioversion is contraindicated in digitalis-toxic patients



Note: A delay once shock button is depressed is normal while the defibrillator searches for R or S wave to synchronise with.

*Equipment required:

- IV access
- Monitoring equipment
- Airway management equipment
- Emergency drugs on hand

*Anaesthetic agents required, :

- Short acting sedation (propofol or midazolam)
- Opioid (e.g. fentanyl)
- Reversal agents (e.g. flumazenil/ naloxone) available

Pharmacological cardioversion can be considered if AF is of short duration since onset. In the absence of structural heart disease flecainide is recommended. Amiodarone does not achieve cardioversion in the short-medium term.^{3,4} Use amiodarone or flecainide only after expert advice.

Atrial Fibrillation – Frequently Asked Questions (FAQs)

What happens if warfarin needs to be stopped for general surgery?

Pre-Operative

Patients with AF who have a high short-term thromboembolic risk (e.g. mitral stenosis, prosthetic valves, previous thromboembolic event) should have warfarin withheld five days before anticipated date of surgery, and IV heparin cover or LMW heparin (at arterial doses) commenced when INR has fallen to below 2. For other patients, warfarin can be ceased for five days pre-operatively without heparin cover.

Post-Operative

Recommence usual antithrombotic therapy without loading dose immediately post-op, or day one post-op, assuming adequate haemostasis.

How do I safely use dabigatran, rivaroxiban or apixaban in my nonvalvular AF patient?

The WA New Oral Anticoagulant Prescribing Guidelines (including recommendations for managing NOACs for procedures) can be found at:

<http://www.watag.org.au/watag/docs/WANewOralAnticoagulantPrescribingGuidelines.pdf>

What to do if the patient with AF is on antiplatelet therapy?

It is not uncommon for a patient with atrial fibrillation to also need antiplatelet treatment for coronary heart disease; unfortunately there is a lack of sufficient evidence to provide clear management pathways for such patients.

The combination of single antiplatelet therapy with anticoagulation significantly increases bleeding risk (up to two-fold or higher), however the greatest risk is in patients on triple therapy, i.e., dual antiplatelet therapy and a Vitamin K antagonist or NOAC. However, dual antiplatelet treatment provides the highest post-stent protection and a NOAC or warfarin alone is not effective at preventing stent thrombosis.

Each patient must be assessed individually and treatment should be based on artherothrombotic, cardioembolic and bleeding risk. Early discussion with a cardiologist is highly recommended and, where possible, aim for the shortest necessary duration of triple therapy.

When should I consider specialist referral for catheter ablation?

Consider referral to an electrophysiologist for discussion of the role of ablation in patients who have symptomatic AF despite medical therapy, including use of one antiarrhythmic medication, or those who are intolerant of, or those who do not wish to take antiarrhythmic drugs. As results of ablation are better in paroxysmal atrial fibrillation, referral should be considered earlier in suitable patients.

Left atrial catheter ablation is a complex ablation procedure with possibly severe complications and expert advice is required before recommending catheter ablation in an individual patient with symptomatic AF.

Further Queries

Please see the list of contacts in Appendix 1.

References

1. Medi C, Hankey GJ, Freedman SB. Atrial fibrillation. Med J Aust. 2007 Feb 19;186(4):197-202. http://www.mja.com.au/public/issues/186_04_190207/med11193_fm.html
2. Goodacre S, Irons R. ABC of clinical electrocardiography: Atrial arrhythmias. BMJ. 2002 Mar 9;324(7337):594-7. <http://www.bmj.com/content/324/7337/594.full>
3. Camm AJ, Kirchhof P, Lip GY, Schotten U, Savelieva I, Ernst S, et al. Guidelines for the management of atrial fibrillation: the Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC). Eur Heart J. 2010; 19: 2369-429. <http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/atrial-fibrillation.aspx>
4. Camm AJ, Lip GY, De Caterina R, Savelieva I, Atar D, Hohnloser H et al. 2012 focused update of the ESC Guidelines for the management of atrial fibrillation. An update of the 2010 ESC Guidelines for the management of atrial fibrillation of the European Society of Cardiology (ESC) Eur Heart J 2012; 33: 2719-47. http://www.escardio.org/guidelines-surveys/esc-guidelines/guidelinesdocuments/guidelines_focused_update_atrial_fib_ft.pdf
5. Fuster V et al. 2011 ACCF/AHA/HRS focused updates incorporated into the 2006 ACC/AHA/ESC guidelines for the management of patients with atrial fibrillation. Circulation 2011; 123: 104-123. doi: 10.1161/CIR.0b013e3181fa3cf4 <http://circ.ahajournals.org/content/123/1/104.long>
6. January CT, Wann S, Alpert JS, Calkins H, Cleveland Jr JC, Cigarroa JE, et al. 2014 AHA/ACC/HRS Guideline for the management of patients with atrial fibrillation. Executive Summary. J Am Coll Cardiol 2014. DOI 10.1016/j.jacc.2014.03.21. <http://content.onlinejacc.org/article.aspx?articleid=1854230>
WATAG New Oral Anticoagulant Prescribing Guidelines <http://www.watag.org.au/watag/docs/WANewOralAnticoagulantPrescribingGuidelines.pdf>
7. Pisters R, Lane DA, Nieuwlaat R, de Vos CB et al. 2010. A Novel user-friendly score (HAS-BLED) to assess 1-year risk of major bleeding in patients with atrial fibrillation: the Euro heart survey. Chest. 2010. 138 (5) 1093-1100 <http://journal.publications.chestnet.org/article.aspx?volume=138&issueno=5&page=1093&etoc>

Glossary of Abbreviations

ACS	Acute Coronary Syndrome
AF	Atrial Fibrillation
ALS	Advance Life Support
BLS	Basic Life Support
BSL	Blood Sugar Level
CHA₂DS₂-VASc	<u>C</u> ongestive Heart Failure/ <u>L</u> eft ventricular hypertension, <u>H</u> ypertension, <u>A</u> ge ≥ 75 , <u>D</u> iabetes Mellitus, <u>S</u> troke/ TIA/ thromboembolism, <u>V</u> ascular Disease (prior MI, peripheral arterial disease or aortic plaque), <u>A</u> ge 65-74, <u>S</u> ex <u>C</u> ategory
CPR	Cardiopulmonary Resuscitation
DC	Direct Current
ECG	Electrocardiogram
FBC	Full Blood Count
IHD	Ischaemic Heart Disease
INR	International Normalised Ratio
IV	Intravenous
LMW	Low Molecular Weight
LV	Left Ventricular
MI	Myocardial Infarction
OAC	Oral anticoagulant
NOAC	New oral anticoagulant
PCI	Percutaneous coronary intervention
SOB	Shortness of Breath
TIA	Transient Ischaemic Attack
TOE	Trans Oesophageal Echo
VASC	<u>V</u> ascular disease (prior myocardial infarction, peripheral artery disease, <u>A</u> ge 65-74, <u>S</u> ex <u>c</u> ategory (i.e. female sex)

Appendices

Appendix 1: Contacts

Medical and Nursing staff are welcome to contact the following centres with any queries regarding AF.

Hospital	Telephone	Other Information
Fremantle Hospital		
Cardiology	9431 3333	Main hospital number Ask for on-call cardiologist or cardiology registrar.
Royal Perth Hospital		
General Cardiology During Business Hours	9224 2244	Main hospital number Ask for on-call cardiologist or cardiology registrar to be paged. Business hours advice on ECGs Fax: 9224 3175.
Out of hours advice	9224 2591	Coronary Care Unit Or call main hospital number as above and ask for cardiology registrar to be paged. Out of hours advice on ECGs Fax: 9224 2605
Sir Charles Gairdner Hospital		
Cardiovascular Medicine	9346 3333	Main hospital number Ask for on-call cardiologist or cardiology registrar to be paged.
Coronary Care Unit	9346 1642	

Appendix 2: Atrial Fibrillation Guidelines, Patient Information and AF Working Group

AF Guidelines

- 2010. European Society of Cardiology (ESC) <http://www.escardio.org/guidelines-surveys/esc-guidelines/Pages/atrial-fibrillation.aspx>
- 2012 focused update. European Society of Cardiology (ESC) http://www.escardio.org/guidelines-surveys/esc-guidelines/guidelinesdocuments/guidelines_focused_update_atrial_fib_ft.pdf
- 2014 ACC/AHA/HRS Guidelines for the Management of Patients with Atrial Fibrillation <http://content.onlinejacc.org/article.aspx?articleid=1854230>
- Revised 2008. New Zealand Guidelines Group (NZGG) [http://www.nzgg.org.nz/guidelines/0085/AF_Full_Guide_\(final\).pdf?bcsi_scan_2C647EB3599034DE=0&bcsi_scan_filename=AF_Full_Guide_\(final\).pdf](http://www.nzgg.org.nz/guidelines/0085/AF_Full_Guide_(final).pdf?bcsi_scan_2C647EB3599034DE=0&bcsi_scan_filename=AF_Full_Guide_(final).pdf)
- 2014. National Institute for Health and Clinical Excellence (NICE) <http://publications.nice.org.uk/atrial-fibrillation-the-management-of-atrial-fibrillation-cg180>
- National Stroke Foundation Best Care Guide to Stroke Management in General Practice <http://www.strokefoundation.com.au/stroke-management-gp>

Patient Information

- The Atrial Fibrillation Association – Australia (AFA-AU) provides information, support and access to established, new or innovative treatments for Atrial Fibrillation (AF). <http://www.atrialfibrillation-au.org/>
- Heart Foundation – provides an atrial fibrillation information sheet. http://www.heartfoundation.org.au/Heart_Information/Heart_Conditions/Atrial_Fibrillation/Pages/default.aspx
- Living with Warfarin – Patient information booklet. http://www.health.wa.gov.au/docreg/Education/Population/Health_Problems/HP8948_warfarin_B.pdf
- Living with a New Oral Anticoagulant: dabigatran, rivaroxaban, apixaban – patient information http://www.wataq.org.au/wamsq/docs/Living_with_a_NOAC_2013.pdf

Appendix 3: AF Working Groups

The [Cardiovascular Health Network](#) and the [Neurosciences and the Senses Health Network](#) would like to acknowledge and thank the following for preparing the 2014 AF update and the AF working group members who developed the 2011 guideline.

2013 AF Guidelines update group

Joseph Hung (Chair)	Winthrop Professor of Cardiology, Sir Charles Gairdner Hospital
David Blacker	Neurologist
Rebecca Godfrey	Project co-ordinator. WA drug evaluation panel
Vince Paul	Consultant Cardiologist
Jacquie Garton-Smith	GP, Royal Perth Hospital Liaison GP and Clinical Lead, Cardiovascular Health Network
Stephen Bloomer	Project Manager Safety and Quality/ Clinical Lead Cardiovascular Health Network

2011 AF working group

Joseph Hung (chair)	Winthrop Professor of Cardiology, Sir Charles Gairdner Hospital
Ellen Baker	Stroke Clinical Nurse Consultant
David Blacker	Neurologist
Stephen Bloomer	Project Manager Safety and Quality/ Clinical Lead Cardiovascular Health Network
Matthew Fay <i>Corresponding member</i>	GP, Atrial Fibrillation Australia Medical Advisory Board
Janine Finucane	Regional CPI Coordinator - Clinical Support
Lesley French	Clinical Nurse Manager WACHS Pilbara
Jacquie Garton-Smith	GP, Royal Perth Hospital Liaison GP and Clinical Lead, Cardiovascular Health Network
Kim Goodman	Development Officer, Health Networks Branch
Brendan McQuillan	Consultant Cardiologist
Shelley McRae	Secondary Prevention and Aboriginal Health Project Officer, Heart Foundation of Australia, WA Division
Tony Mylius	Regional Medical Director, WACHS Wheatbelt
Vince Paul	Consultant Cardiologist
Susan Shales <i>Corresponding member</i>	Clinical Unit Manager, Esperance Hospital
Pravin Shetty <i>Corresponding member</i>	Specialist Physician, WACHS Goldfields
Sue York	Clinical Nurse Specialist, Home Hospital, Silver Chain
Leanne Waterton	A/Senior Development Officer, Health Networks Branch



This document can be made available in alternative formats on request for a person with a disability.

© Department of Health 2014

Copyright to this material is vested in the State of Western Australia unless otherwise indicated. Apart from any fair dealing for the purposes of private study, research, criticism or review, as permitted under the provisions of the *Copyright Act 1968*, no part may be reproduced or re-used for any purposes whatsoever without written permission of the State of Western Australia.