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Atrial Fibrillation – Diagnosis and Management

Effective Date: July 26, 2023

Scope

This guideline provides recommendations for the diagnosis and management of atrial fibrillation (AF) including the primary prevention of stroke and systemic embolism in adults aged ≥ 19 years. It also covers the management of AF in the acute care and outpatient office settings. Management of atrial flutter (AFL) is also included.

Key Recommendations

- Opportunistic screening for AF (pulse check for 20 seconds) in people ≥ 65 years is recommended.
- Treat all patients with valvular AF (mechanical valve or moderate to severe mitral stenosis) with warfarin (direct oral anticoagulants [DOACs] should not be used).
- Use the Canadian Cardiovascular Society (CCS) Algorithm ("CHADS-65") in all patients with non-valvular AF to determine the need for stroke prevention therapy.
- DOACs are recommended in patients age ≥ 65 years or with $CHADS_2$ score ≥ 1 who have non-valvular AF.
- Rhythm control is preferred as the initial treatment strategy in patients with *recently diagnosed* AF (within a year) because it is associated with reduced cardiovascular death and reduced rates of stroke.
- Long-term oral antiarrhythmic therapy should not be continued in patients when AF becomes permanent.
- Patients with AFL should be stratified and managed in the same manner as those with AF, except that catheter ablation is preferred over pharmacotherapy for rate/rhythm control.
- Manage contributory comorbidities, such as hypertension, diabetes, and heart failure.
- Use the CCS Symptoms of Atrial Fibrillation (CCS-SAF) score to help triage patients with Class 3 or 4 severity for specialist care.
- Use of i.v. β-blockers, diltiazem, verapamil, digoxin, and amiodarone are contraindicated for acute management of pre-excitation AF (e.g., Wolff-Parkinson-White) because of the potential to precipitate a life-threatening arrhythmia.

Definition[1,2]

By convention, the diagnosis of AF requires electrocardiogram (ECG) documentation of an irregular rhythm with no discernible, distinct P waves, lasting at least 30 seconds.

AF is classified according to the persistence of episodes (Refer to Appendix A: Types of Atrial Fibrillation) and valve structure.

Valvular AF: AF in the presence of moderate/severe mitral stenosis or mechanical valve.

Non-valvular AF (NVAF): all other patients without the presence of moderate/severe mitral stenosis or mechanical valve.

Epidemiology[1-3]

The prevalence of AF is estimated to be 3% in the general population and increases significantly with age (< 1.0% up to 50 years of age, 4% at 65 years, and 12% of those 80 and older). AF can occur in up to 50% of young patients with Wolff-Parkinson-White (WPW) syndrome. For a list of risk factors for AF see Appendix B: Risk Factors for the Development of AF.

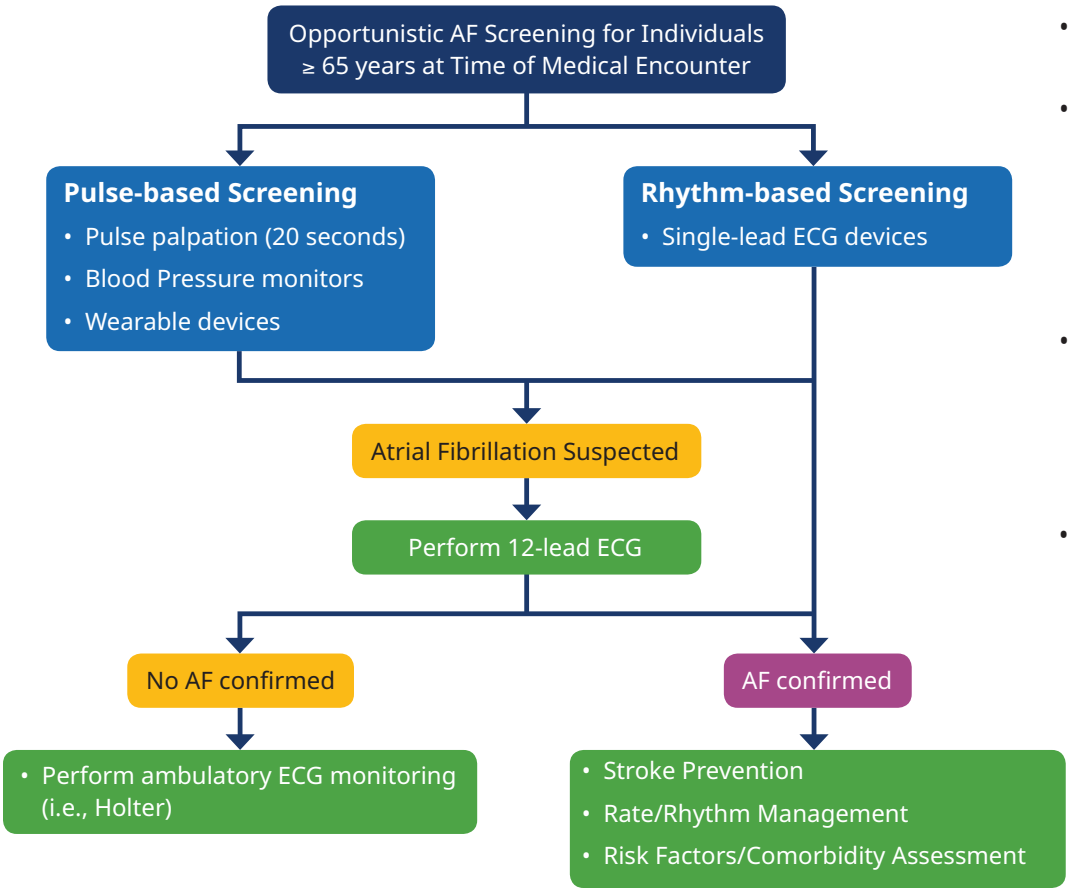
AF is independently associated with a 1.5- to 4-fold increased risk of mortality (predominantly due to increased risk of thromboembolic events and ventricular dysfunction). Non-anticoagulated patients with AF have a 3- to 5-fold increased risk of stroke. To date, the only therapeutic intervention that has been consistently shown to improve survival in the AF population is the use of an oral anticoagulant (OAC).[1]

AFL also carries a significant risk of stroke/system embolism (annual risk ~3%) and often co-exists with AF.

Screening

Opportunistic screening for AF in people ≥ 65 years is recommended.[1]

Figure 1: Screening for AF*



- Definition of an AF episode is 30 seconds.
- When a pulse check or a wearable device suggests the presence of AF, confirmation with a 12-lead ECG or ambulatory Holter monitor is required.
- A 12-lead ECG is not needed for confirmation of diagnosis if AF is detected on a single-lead rhythm strip.
- Perform additional testing (e.g., ambulatory ECG monitoring) as needed when AF is not confirmed with 12-lead ECG, but suspicion still exists.

*Modified from 2020 CCS Guidelines[1]

Diagnosis and Assessment[1]

Patients with AF/AFL may be asymptomatic or may present with symptoms such as palpitations, dyspnea, dizziness, presyncope, syncope, chest pain, weakness, or fatigue. Assessment requires a targeted history, physical examination, ECG, and laboratory investigations.

Table 1: Assessment of Patients with AF/AFL (modified from 2020 CCS Guidelines[1])

Complete AF History
Establish: • Date of first symptomatic attack • Date of first objective confirmation • Presence and nature of symptoms • Symptom severity (See Appendix C: Assessing Atrial Fibrillation Symptom Severity with the CCS-SAF Scale) **Identify:** • Risk factors/ co-morbid conditions (e.g., advancing age, male sex, HTN, HFrEF, valvular heart disease, thyroid disease, OSA, obesity, excessive alcohol intake, congenital heart disease, CKD, diabetes) • **Triggers** for AF (stimulants, alcohol, sleep deprivation, emotional stress, physical exertion, gastrointestinal) • **Reversible causes** (surgery, cardiac or pulmonary pathology, infection, alcohol, thyrotoxicosis, medications, supraventricular tachycardia, ventricular pacing) **Review:** • Family history • Prior interventions for AF, their efficacy, tolerance, adverse effects • AF-related hospitalizations, emergency department visits, cardioversions
Examination
• Blood pressure, heart rate • Height, weight, waist circumference, BMI • Focused exam for co-morbid risk conditions or secondary causes of AF
Routine Investigations (if not done within the past 3 months)
• Laboratory investigations - CBC - Sodium, potassium, calcium, and magnesium - ALT, AST, GGT and bilirubin (prior to starting DOAC) - INR (prior to starting warfarin) - Creatinine - TSH - Lipid profile - Hemoglobin A1C • 12-lead electrocardiogram • Transthoracic echocardiogram

Abbreviations: **AF** – Atrial Fibrillation, **AFL** – Atrial Flutter, **HTN** – Hypertension, **HFrEF** – Heart Failure With Reduced Ejection Fraction, **OSA** – Obstructive Sleep Apnea, **CKD** – Chronic Kidney Disease, **BMI** – Body Mass Index, **CBC** – Complete Blood Count, **INR** – International Normalized Ratio, **ALT** – Alanine Transaminase Test, **AST** – Aspartate Transferase Test, **GGT** – Gamma-glutamyl Transferase Test, **TSH** – Thyroid Stimulating Hormone.

Management of AF/AFL

The goals of AF/AFL management are to:

- prevent stroke and systemic thromboembolism
- reduce cardiovascular risks
- improve symptoms, functional capacity, and quality of life
- prevent complications (e.g., left ventricular dysfunction).

There are three pillars in the management of AF/AFL:

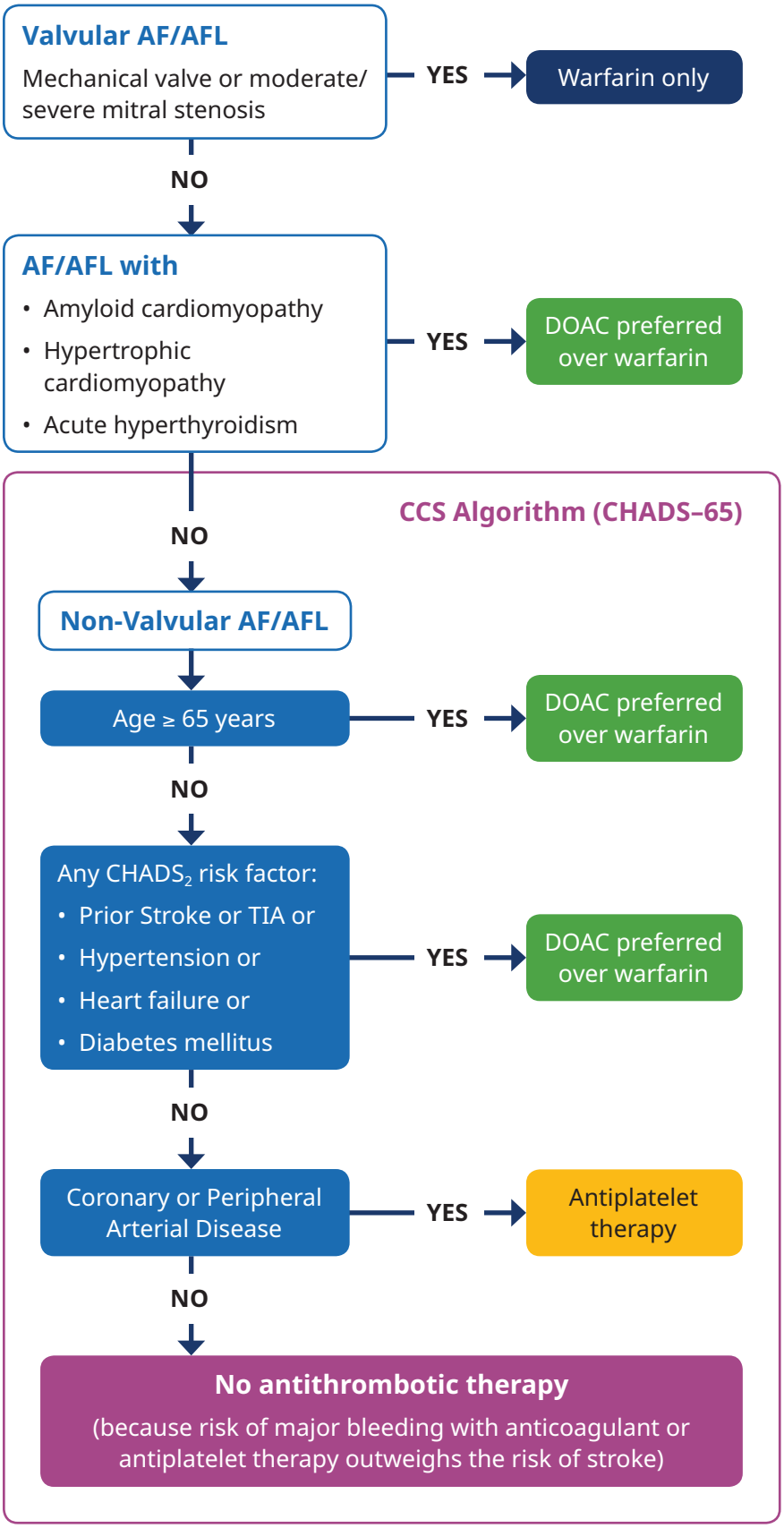
1) Stroke/systemic embolism prevention
2) Arrhythmia management (i.e., rate and rhythm control). Approach to rate and rhythm control differs somewhat depending on the duration of AF and whether the patient is presenting in an outpatient or acute care/emergency department setting.[1]
3) Management of modifiable risk factors and comorbidities

Stroke Prevention

Antithrombotic therapy using an OAC is the cornerstone of stroke and systemic embolism prevention in AF by reducing the risk of cardioembolic events.[1] Most patients will require and benefit from OAC therapy. OAC is indicated in those with valvular AF, amyloid, hypertrophic cardiomyopathy or acute hyperthyroidism and those with NVAF over age 65 or NVAF and a $CHADS_2$ risk factor. However, OAC is not recommended for NVAF patients < 65 years with none of the $CHADS_2$ risk factors because the risk of stroke is very low in this group. See Figure 2: Antithrombotic Therapy for Stroke Prevention in AF/AFL.

In patients with device-detected (e.g., pacemaker) AF, there appears to be an association between duration of AF and risk of stroke/systemic embolism. There is expert agreement that OAC should be considered according to the CCS algorithm (CHADS-65; see Figure 2: Antithrombotic Therapy for Stroke Prevention in AF/AFL) when device-detected AF lasts longer than 24 hours, regardless of the presence or absence of symptoms. There is no consensus for optimal treatment for shorter episodes.

Figure 2: Antithrombotic Therapy for Stroke Prevention in AF/AFL*



- All patients with valvular AF (mechanical valve or moderate to severe mitral stenosis) should be treated with warfarin.[4,5] See BCGuidelines: Warfarin for target INR.
- **Direct oral anticoagulants (DOACs) are contraindicated in patients with valvular AF.**[4,5]
- For patients with NVAF, use the CCS Algorithm (CHADS-65) to determine the optimal antithrombotic therapy. CHADS-65 complements the use of the $CHADS_2$ and CHA_2DS_2-VASc scores, both of which estimate the annual risk of stroke. See Appendix D: Stroke Risk Assessment in Atrial Fibrillation – $CHADS_2$ and CHA_2DS_2-VASc Scores for these scores and stroke risk.
- **DOACs are preferred over warfarin in NVAF because pooled data from randomized trials have shown that the risks of stroke/ systemic embolism, intracranial bleed and all-cause mortality are significantly reduced with DOAC compared with warfarin.**[6] See approved DOACs and their standard doses in BCGuideines: Direct Acting Oral Anticoagulants (DOACs).
- Antiplatelet therapy options include: ASA 81 mg daily alone, clopidogrel 75 mg daily alone, or ASA 81 mg daily combined with clopidogrel 75 mg daily, ticagrelor 60 mg bid, or rivaroxaban 2.5 mg bid, depending on clinical circumstance. Note – the antiplatelet therapy is provided primarily for the management of concomitant vascular disease and not as a stroke preventative therapy per se. See Appendix E: Management of Antithrombotic Therapy in Patients with AF and CAD/PAD.
- Absence of symptoms (e.g., in subclinical AF) does not change management.

*Modified from 2020 CCS Guidelines[1]
Abbreviations: **AF** – Atrial Fibrillation, **AFL** – Atrial Flutter, **DOAC** – direct oral anticoagulant

Special Considerations in Stroke Prevention

See BC Guidelines for details of OAC usage, including warfarin, DOAC and periprocedural management.

Cardioversion

- OAC for a minimum of 3 weeks is needed BEFORE planned cardioversion in the following patients:
  - Valvular AF
  - NVAF episode duration < 12 hour and recent (< 6 months) stroke or transient ischemic attack (TIA)
  - NVAF episode duration 12 – 48 hours and $CHADS_2$ score > 2
  - NVAF episode duration > 48 hours
- OAC for a minimum of 4 weeks is needed AFTER cardioversion and then long-term anticoagulation should be managed according to CHADS-65.

Catheter or Surgical Ablation[1,7,8]

- Uninterrupted OAC is considered the standard of care for patients undergoing ablation for AF/AFL.
- Uninterrupted OAC typically means initiating OAC 3 – 4 weeks before the procedure, continuing OAC right up to the time of procedure (it is reasonable to hold 1 – 2 doses for DOACs before ablation), and reinitiating OAC 6 – 12 hours after the procedure.
- Post ablation OAC management:
  - Continue OAC for at least 2 months after AF ablation.
  - Thereafter, provide OAC according to the CCS algorithm (CHADS-65; see Figure 2: Antithrombotic Therapy for Stroke Prevention in AF/AFL) because the risk of stroke may not be sufficiently reduced even after successful ablation (i.e., achieving normal sinus rhythm). This is especially true for those with high thromboembolic risk profile.
- If OAC is indicated by CHADS-65 but patient prefers to stop, ongoing monitoring for AF recurrence is needed and consultation with specialist is recommended. Research is addressing optimal duration of OAC post ablation.

Coronary Artery Disease

- Patients with AF/AFL AND recent coronary stents may require combination OAC and antiplatelet therapy for a limited period following revascularization as directed by the interventional cardiologist.
- Patients with AF/AFL AND stable coronary or arterial vascular disease (e.g., greater than 1 year following revascularization) should receive antithrombotic therapy based on CHADS-65. **Combination of ASA and OAC beyond 1 year is NOT recommended because it increases bleeding risk without the benefit of greater efficacy** (See Appendix E: Management of Antithrombotic Therapy in Patients with AF and CAD/PAD).

Frail Elderly

- Anticoagulant therapy is recommended for most frail elderly patients with AF/AFL. The net clinical benefit favours anticoagulation, even in those with higher risk of falls, as these patients are at higher risk of stroke and more likely to benefit from OAC than younger patients.
- It is estimated that patients with AF taking warfarin have to fall more than 295 times in 1 year for the risks of warfarin to outweigh its benefits. Fall risk alone should therefore not be a reason to withhold anticoagulation.[9]
- Attention should be paid to polypharmacy in elderly patients, because of high potential for drug-drug interactions. See BCGuidelines: Direct Acting Oral Anticoagulants (DOACs).

Patients Unable to Receive Anticoagulant Therapy or With History of Intracranial Hemorrhage

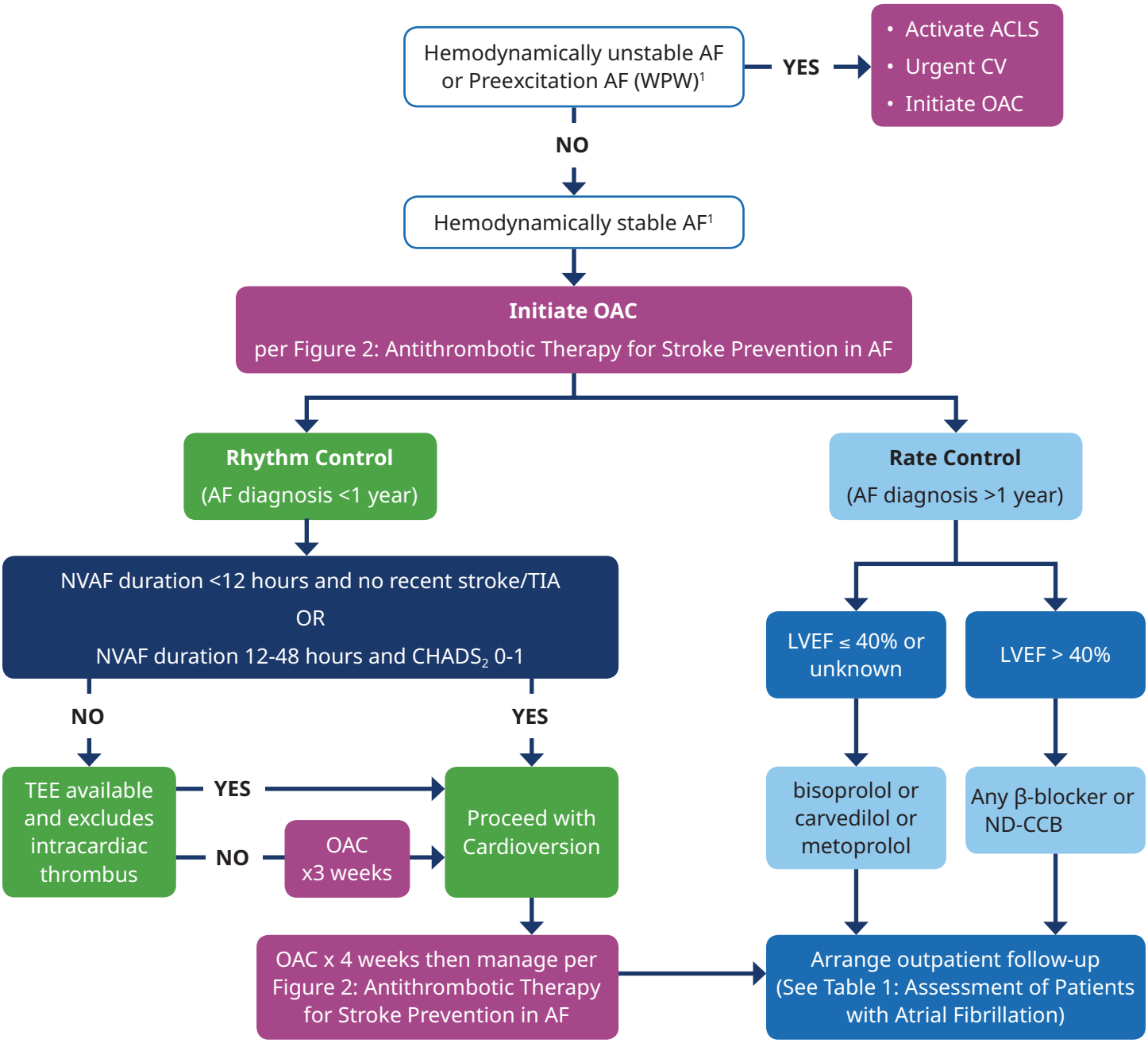
- Patients at moderate to high risk of stroke who have absolute contraindications for anticoagulation should be referred to assessment for possible left atrial appendage occlusion.
- Patients with history of intracranial hemorrhage while on OAC may or may not be able to resume OAC. Referral to a Stroke Neurologist for assessment is recommended.

Patients with high body weight or BMI > 40 kg/m²

- Increasing BMI is associated with a higher risk of bleeding but lower risk of stroke/systemic embolism.
- Recent studies have shown DOACs to be similarly effective and safer than warfarin for reduction of stroke and systemic embolism in these patients.
- For severely obese patients, an individualized approach (See BCGuidelines: Direct Acting Oral Anticoagulants (DOACs)) to balance the efficacy and safety profile may be necessary.[1,10]

Management of Rate and Rhythm in An Acute Care Setting

Figure 3: Approach to Managing Rate and Rhythm in the Acute Care Setting*



[1] Hemodynamically stable patients with pre-excitation AF (e.g., Wolff-Parkinson-White) should undergo electrical or pharmacologic (i.v. procainamide) cardioversion to restore sinus rhythm.

*Modified from 2020 CCS Guidelines[1]. Abbreviations: **ACLS** – Advanced Cardiovascular Life Support, **CV** – Cardioversion, **LVEF** – Left Ventricular Ejection Fraction, **ND-CCB** – Nondihydropyridine Calcium Channel Blockers, **NVAF** – Non Valvular AF, **OAC** – Oral Anticoagulant, **TEE** – Transesophageal Echocardiography, **WPW** – Wolff-Parkinson-White Syndrome.

Rhythm Control in Acute Care

- In those patients with recently diagnosed AF (within 1 year), an initial strategy of rhythm control is preferred as the first treatment strategy because it is associated with reduced cardiovascular death and reduced rates of stroke.[11] However, antiarrhythmic drugs have not been associated with a beneficial effect on mortality and many have significant adverse effects.
- In patients with established AF (duration > 1 year), multiple randomized controlled trials (RCTs) have shown no significant difference in cardiovascular outcomes between patients treated with a strategy with rate control vs rhythm control. In this group the decision to use each therapy should be made according to shared decision-making and taking into account patient preferences (see Figure 4: Approach to Managing Rate and Rhythm in Patients with Paroxysmal or Persistent AF in the Outpatient Setting).
- Electrical or pharmacological (i.v. procainamide) cardioversion can be used for sinus rhythm restoration in hemodynamically stable patients. Electrical cardioversion is more effective and is preferred if procedural sedation is available.
- **Use of i.v. β-blockers, diltiazem, verapamil, digoxin, and amiodarone are contraindicated for acute management of pre-excitation AF (e.g., WPW) because of the potential to precipitate a life-threatening arrhythmia.** See section WPW under special considerations.

Rate Control in Acute Care

- Titrate rate-controlling agents to achieve a target heart rate of ≤ 100 bpm at rest.[1]
- In patients with LVEF > 40%, there are no randomized long-term data to indicate a preference between a β-blocker and a non-dihydropyridine calcium channel blocker (ND-CCB).
- Use caution when administering i.v. formulations of β-blockers, ND-CCBs or amiodarone because of risk of precipitating hypotension. Introduce oral formulations as soon as possible to avoid rebound tachycardia seen when i.v. formulation wears off.

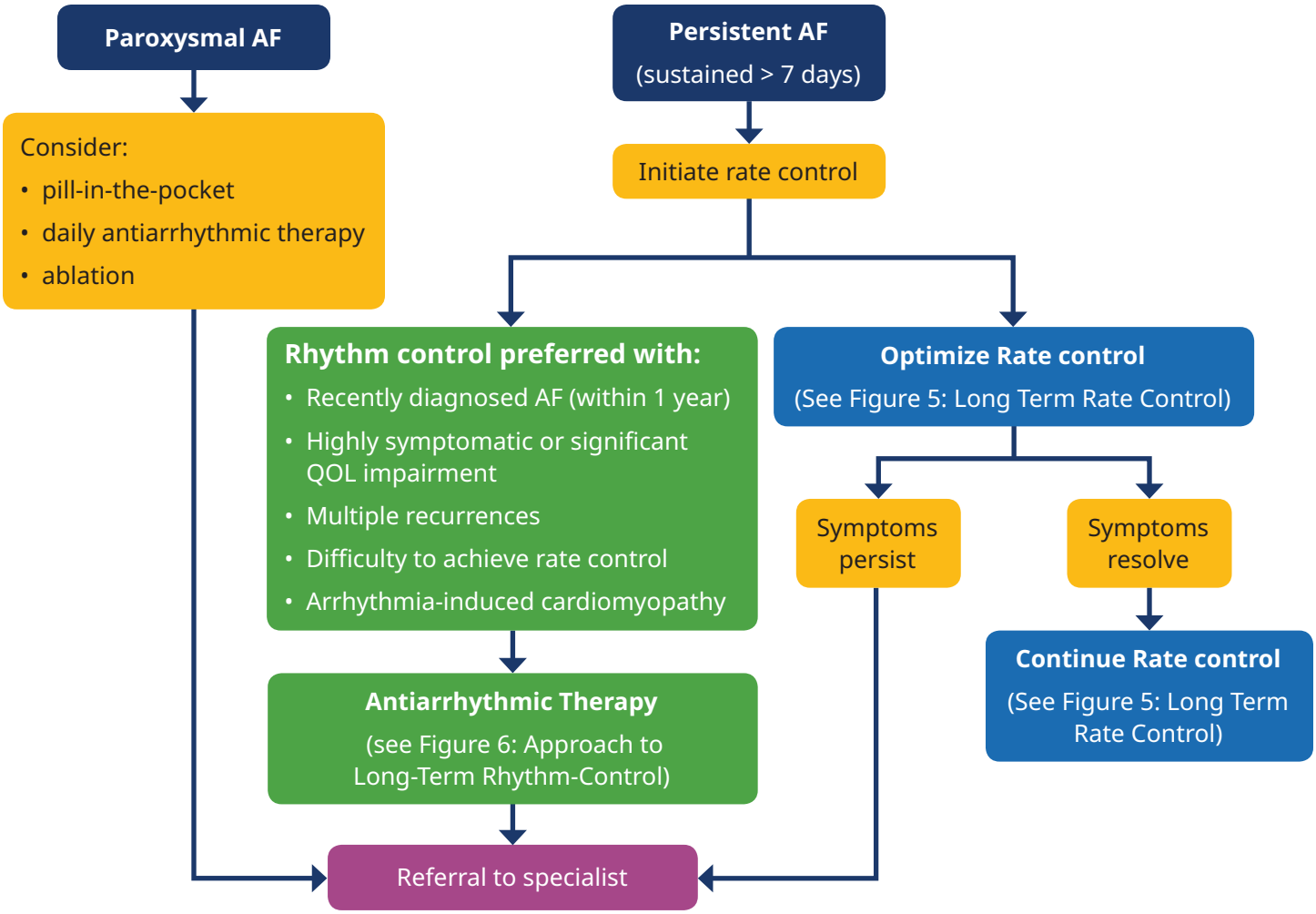
Follow-Up after Acute Care Setting

- Determine if patient needs to be hospitalized (if highly symptomatic, co-existing acute/complex medical conditions, if adequate rate control cannot be achieved, or need for investigations not readily available in an outpatient setting).
- If hospitalization not required, then arrange medical follow-up in an outpatient setting, ideally within 7 – 14 days.

Management of Rate and Rhythm in the Outpatient Setting

- Patients with AF may present with or without symptoms (see Appendix C: Assessing Atrial Fibrillation Symptom Severity with the CCS-SAF Scale for symptom severity scale).
- Approach to rate and rhythm control in the outpatient/long term setting is dependent on
  1) type of AF (paroxysmal vs persistent),
  2) duration of AF,
  3) LV function, and
  4) patient symptoms and preferences.

Figure 4: Approach to Managing Rate and Rhythm in Patients with Paroxysmal or Persistent AF in the Outpatient Setting*



*Modified from 2020 CCS Guidelines[1]

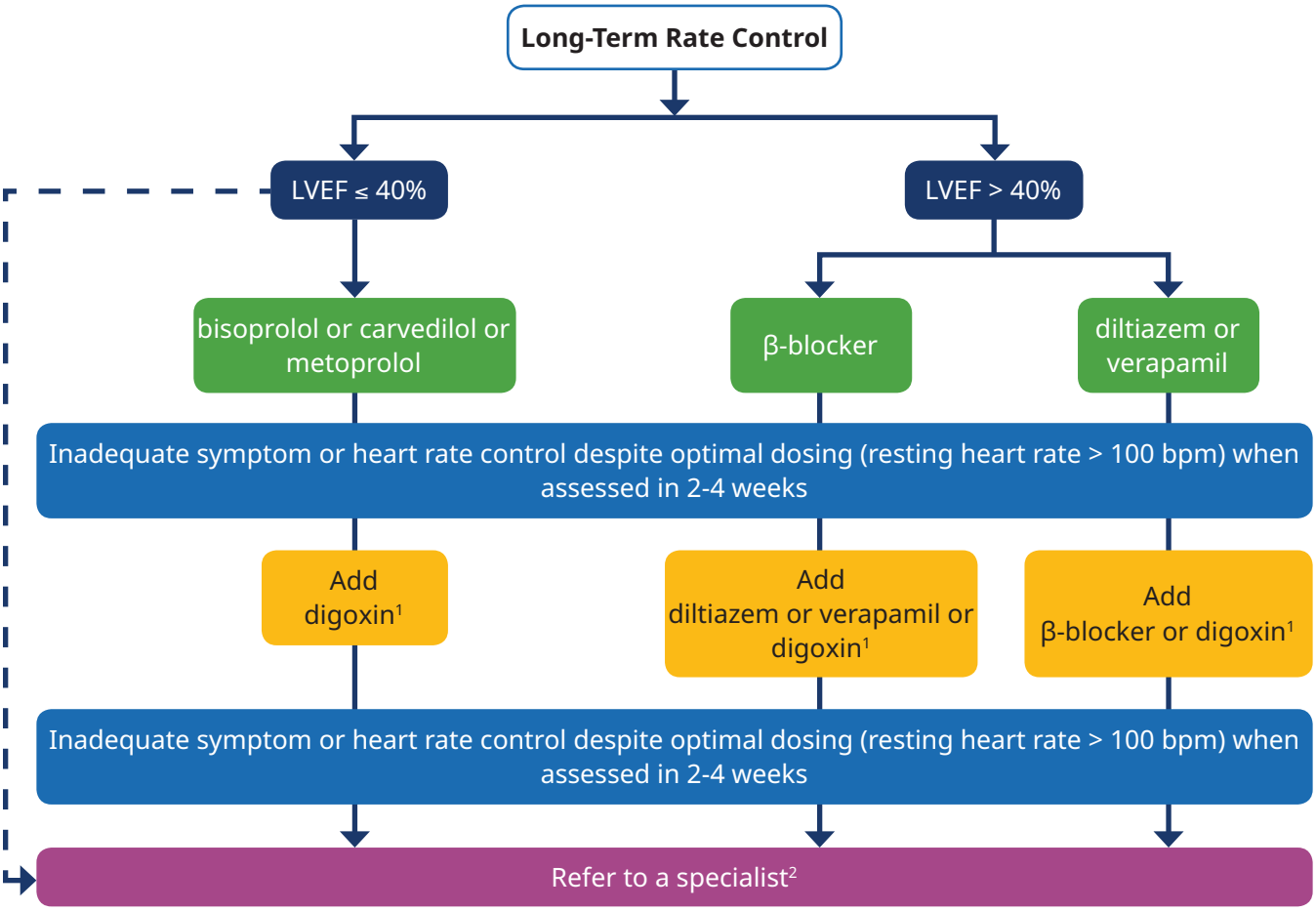
Abbreviation: **AAD** – Antiarrhythmic Drug, **AF** – Atrial Fibrillation, **QOL** – Quality of Life

- In those patients with recently diagnosed AF (within 1 year), an initial strategy of rhythm control is preferred as the first treatment strategy because it is associated with reduced cardiovascular death and reduced rates of stroke.[11] However, antiarrhythmic drugs have not been associated with a beneficial effect on mortality and many have significant adverse effects.
- In those patients with established AF (duration > 1 year), RCTs have shown no significant difference in cardiovascular outcomes between patients treated with a strategy with rate control vs rhythm control.
- Referral to a specialist is recommended in those who remain symptomatic despite maximally tolerated rate control therapy.
- Catheter ablation is preferred to pharmacotherapy for AFL because of the relatively high success rate and low complication rate of the procedure.

Long-term Rate Control

- Titrate rate-controlling agents to achieve a target heart rate of ≤ 100 bpm at rest.
- Patients who are unable to tolerate pharmacological therapy or who do not achieve target rate control should be referred for specialist consultation.

Figure 5: Approach to Long Term Rate Control*



[1] Digoxin is most beneficial in addition to first-line agents when target heart rate is not achieved. It can also be considered as monotherapy in sedentary individuals with side effects or contraindication to first-line agents. Digoxin level monitoring is recommended in those at risk for adverse events (e.g., female with low body weight and impaired renal function), aiming for trough levels between 0.5 and 0.9 ng/mL.

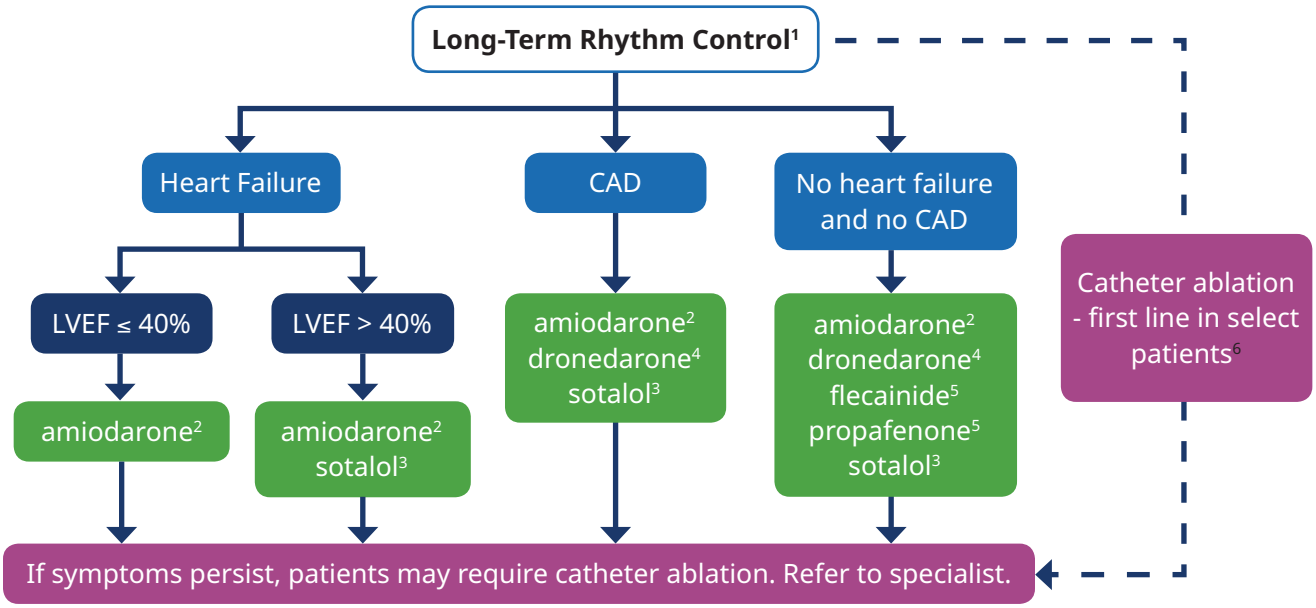
[2] For patients with difficult to control symptoms and heart rate despite combination therapy, consideration should be made to refer to electrophysiology for evaluation (and/or pacemaker implantation and atrioventricular junction ablation).

*Modified from 2020 CCS Guidelines[1].

Long Term Rhythm Control

- The focus of rhythm control is on symptom relief, improving functional capacity and quality of life, and reducing health care utilization, and not necessarily the elimination of all AF episodes.
- Long-term oral antiarrhythmic therapy should not be continued in patients with permanent AF because antiarrhythmic drugs have not been associated with a beneficial effect on mortality and many have significant adverse effects.
- Consultation with specialists is recommended if antiarrhythmic therapy is being considered (See Figure 6: Approach to Long Term Rhythm Control). The choice of antiarrhythmic therapy is primarily driven by safety and tolerability because they have a relatively similar efficacy while all drugs have significant adverse effects. See Appendix F: Prescription Medication Tables for Atrial Fibrillation for dosage and therapeutic considerations.

Figure 6: Approach to Long Term Rhythm Control*



[1] Consider AF symptom burden, possibility of adverse drug reactions and patient preference
[2] Consider alternative antiarrhythmic drugs or ablation rather than long-term amiodarone (significant risk of extra-cardiac side-effects)
[3] Sotalol should be used with caution in patients with high-risk features for torsade de pointes (≥ 65 years, women, reduced renal function, concomitant potassium-wasting diuretics). Sotalol is not recommended for patients with left ventricular hypertrophy.
[4] Dronedarone should be used with caution in combination with digoxin. Dronedarone is contraindicated in patients with permanent AF. Refer to Appendix F for other contraindications.
[5] Class IC agent should be combined with atrioventricular-nodal blocking agent. Use caution for patients with left ventricular hypertrophy.
[6] See section Catheter Ablation

*Modified from 2020 CCS Guidelines[1]. Abbreviations: **CAD** – Coronary Artery Disease, **LVEF** – Left Ventricular Ejection Fraction.

Special Considerations in Arrhythmia Management

Wolff-Parkinson-White Syndrome (WPW)

- WPW is a pre-excitation syndrome in patients who have an additional accessory pathway (also called bundle of Kent) that directly connects the atria and ventricles, thereby allowing electrical activity to bypass the atrioventricular node, leading to "preexcitation" or earlier than usual activation of the His-Purkinje system.
- Rapid conduction of AF via accessory pathway is rare but can result in ventricular fibrillation and sudden cardiac death.
- Use electrical or pharmacologic (using i.v. procainamide) cardioversion to restore sinus rhythm in hemodynamically stable patients.
- β-blockers, diltiazem, verapamil, digoxin, and amiodarone are **contraindicated** for acute management of pre-excitation AF because of the potential to precipitate a life-threatening arrhythmia.
- Catheter ablation is the treatment of choice for chronic management of pre-excitation AF.

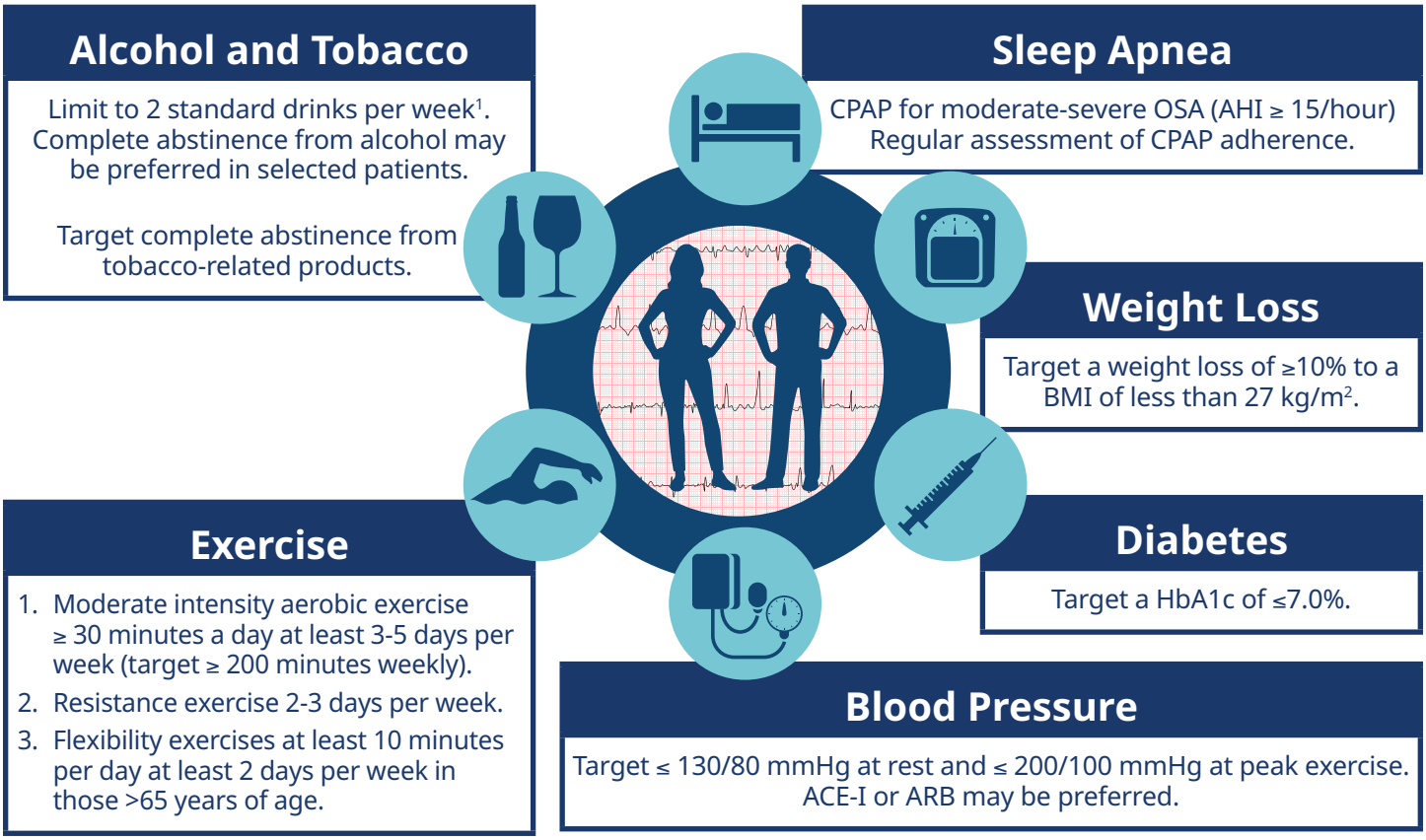
Catheter Ablation

- Current evidence shows that the cryoablation as a first therapy (vs. antiarrhythmic drugs) is associated with reduction in arrhythmia recurrence, healthcare utilization (hospitalization, ED visits, cardioversion) and improvement in quality of life for 3 years after the procedure.
- In patients with AFL, catheter ablation is preferred to pharmacotherapy because of the relatively high success rate and low complication rate of the procedure.
- Select patients with AF who might benefit from catheter ablation as first-line therapy include:
  - Heart failure or reduced ejection fraction, particularly those with tachycardia-induced cardiomyopathy.
  - Treatment-naïve patients who are younger without significant comorbidities.

Management of Comorbid Conditions

- In addition to the key modifiable risk factors and treatment targets outlined in Figure 7: The Components of Modifiable Risk Factor Management for AF Patients, consideration should be given to manage co-existing conditions consistent with contemporary guideline recommendations.
- Please refer to other BC guidelines on Hypertension, Diabetes Care, and Obstructive Sleep Apnea.

Figure 7: The Components of Modifiable Risk Factor Management for AF Patients*



[1] Canada's Guidance on Alcohol and Health: Final Report, 2023

*reproduced with permission from CCS 2020 guidelines[1] with updated recommendation on alcohol use.

Abbreviations: **ACE-I** – Angiotensin-Converting Enzyme Inhibitor, **AHI** – Apnea-Hypoxia Index, **ARB** – Angiotensin II Receptor Blocker, **BMI** – Body Mass Index, **CPAP** – Continuous Positive Airway Pressure, **HbA1C** – Hemoglobin A1c, **OSA** – Obstructive Sleep Apnea.

Indications for Potential Specialist Referral

- AF in a patient aged ≤ 60 years with no evidence of associated cardiopulmonary or other comorbid disease.
- Those with an underlying electrophysiological disorder (e.g., pre-excitation/WPW) or those with co-existing heart failure.
- Patients with paroxysmal AF or AFL.
- When pharmacologic therapy fails to ameliorate AF-related symptoms and/or improve quality of life.
- Patients with relative or absolute contraindication for anticoagulants. Some of these patients might be candidates for left atrial appendage occlusion.
- Other specialist clinics of value to AF patients include AF clinics (AF clinics require ECG documentation before accepting patients), Diabetes clinics, Heart Failure clinics, Rapid Access Stroke clinics.

Resources

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Abbreviations:

AAD	Antiarrhythmic Drug
ACE-I	Angiotensin-Converting Enzyme Inhibitor
ACLS	Advanced Cardiovascular Life Support
AF	Atrial Fibrillation
AFL	Atrial Flutter
AHI	Apnea Hypoxia Index
ARB	Angiotensin II Receptor Blocker
ASA	Acetylsalicylic Acid
AVJ	Atrioventricular junction
BMI	Body Mass Index
CBC	Complete Blood Count
CCS	Canadian Cardiovascular Society
CCS-SAF	CCS Symptoms of Atrial Fibrillation
CKD	Chronic Kidney Disease
CPAP	Continuous Positive Airway Pressure
CV	Cardioversion
DCCV	Direct Current Cardioversion
EF	Ejection Fraction
HbA1C	Hemoglobin A1c
HF	Heart Failure
HFrEF	Heart Failure with Reduced Ejection Fraction
HTN	Hypertension
INR	International Normalized Ratio
LVEF	Left Ventricular Ejection Fraction
ND-CCB	Nondihydropyridine Calcium Channel Blockers
NVAF	Non-Valvular AF
OAC	Oral Anticoagulant
OSA	Obstructive Sleep Apnea
PAD	Peripheral Artery Disease
QOL	Quality of Life
TEE	Transesophageal Echocardiography
TIA	Transient Ischemic Attack
TSH	Thyroid Stimulating Hormone
WPW	Wolff-Parkinson-White syndrome

Practitioner Resources

RACE: Rapid Access to Consultative Expertise Program – www.raceconnect.ca

RACE means timely telephone advice from specialist for Physicians, Medical Residents, Nurse Practitioners, Midwives, all in one phone call. Monday to Friday 0800 – 1700

Online at www.raceapp.ca or though Apple or Android mobile device. For more information on how to download RACE mobile applications, please visit www.raceconnect.ca/race-app/

Local Calls: 604–696–2131 | Toll Free: 1–877–696–2131

For a complete list of current specialty services visit the Specialty Areas page.

Pathways – PathwaysBC.ca

An online resource that allows GPs and nurse practitioners and their office staff to quickly access current and accurate referral information, including wait times and areas of expertise, for specialists and specialty clinics. In addition, Pathways makes available hundreds of patient and physician resources that are categorized and searchable.

General Practice Services Committee – www.gpscbc.ca

- **Practice Support Program:** offers focused, accredited training sessions for BC physicians to help them improve practice efficiency and support enhanced patient care.
- **Chronic Disease Management and Complex Care Incentives:** compensates GPs for the time and skill needed to work with patients with complex conditions or specific chronic diseases.

Health Data Coalition: hdcbc.ca

An online, physician-led data sharing platform that can assist you in assessing your own practice in areas such as chronic disease management or medication prescribing. HDC data can graphically represent patients in your practice with chronic kidney disease in a clear and simple fashion, allowing for reflection on practice and tracking improvements over time.

HealthLinkBC: healthlinkbc.ca

HealthLinkBC provides reliable non-emergency health information and advice to patients in BC. Information and advice on managing Diabetes in several languages is available by telephone, website, a mobile app, and a collection of print resources. People can speak to a health services navigator, registered dietitian, registered nurse, qualified exercise professional, or a pharmacist by calling 8-1-1 toll-free in B.C, or 7-1-1 for the deaf and hard of hearing.

BCGuidelines, www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines – Cardiovascular Disease – Primary Prevention; Diabetes Care, Heart Failure – Diagnosis and Management; Hypertension – Diagnosis and Management, Obstructive Sleep Apnea.

Heart and Stroke Foundation – British Columbia and Yukon, www.heartandstroke.bc.ca

Canadian Stroke Network, www.canadianstrokenetwork.ca

Stroke Services BC, www.phsa.ca/AgenciesAndServices/Services/stroke-services-bc.htm

Patient Resources

HealthLinkBC: *Atrial Fibrillation*
Thrombosis Canada: Atrial Fibrillation

Diagnostic Codes

427.3 [I48] – Cardiac Dysrhythmia

Appendices

- Appendix A: Types of Atrial Fibrillation
- Appendix B: Risk Factors for the Development of AF
- Appendix C: Assessing Atrial Fibrillation Symptom Severity with the CCS-SAF Scale
- Appendix D: Stroke Risk Assessment in Atrial Fibrillation - $CHADS_2$ and CHA_2DS_2-VASc Score
- Appendix E: Management of Antithrombotic Therapy in Patients with AF And CAD/PAD
- Appendix F: Prescription Medication Tables for Atrial Fibrillation

Associated Documents

The following documents accompany this guideline:

- List of Contributors

This guideline is based on scientific evidence current as of the effective date.

This guideline was developed by the Guidelines and Protocols Advisory Committee in collaboration with the Provincial Laboratory Medicine Services and adopted under the *Medical Services Act* and the *Laboratory Services Act*.

For more information about how BC Guidelines are developed, refer to the GPAC Handbook available at BCGuidelines.ca: GPAC Handbook.

THE GUIDELINES AND PROTOCOLS ADVISORY COMMITTEE

The principles of the Guidelines and Protocols Advisory Committee are to:

- encourage appropriate responses to common medical situations
- recommend actions that are sufficient and efficient, neither excessive nor deficient
- permit exceptions when justified by clinical circumstances

Contact Information:

Guidelines and Protocols Advisory Committee
PO Box 9642 STN PROV GOVT
Victoria BC V8W 9P1

Email: hlth.guidelines@gov.bc.ca
Website: www.BCGuidelines.ca

Disclaimer

Appendix A: Types of Atrial Fibrillation[3]

Clinical Assessment

AF pattern is defined according to the clinical assessment of episode persistence. The initial AF presentation is classified as "newly detected/diagnosed" irrespective of the presumed duration of the arrhythmia. Thereafter AF is classified into four clinical patterns: paroxysmal, persistent, long-standing persistent, and permanent. These categories are not exclusive of each other. The absence of symptoms (e.g., in subclinical AF) does not change classification.

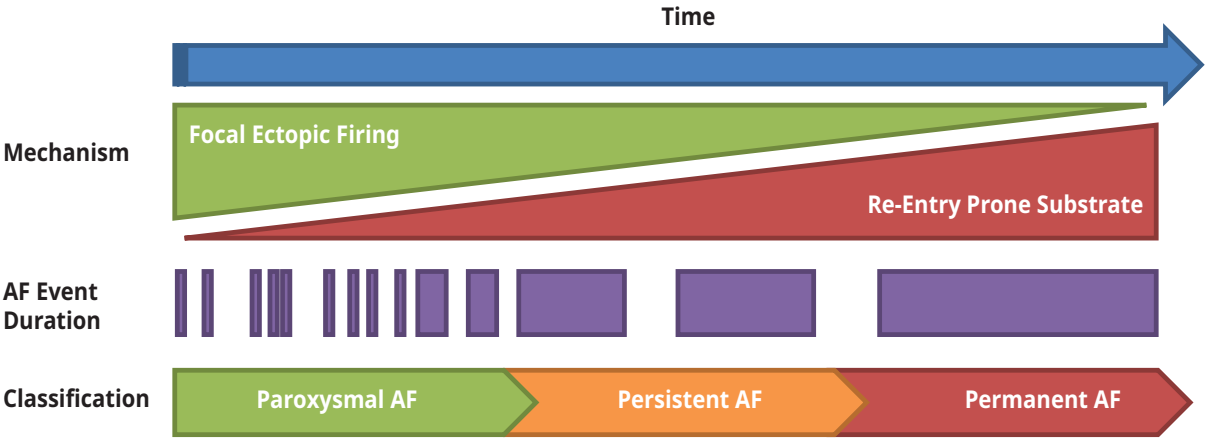
Paroxysmal AF	AF which terminates spontaneously or with intervention within 7 days of onset. The duration of the paroxysmal AF is usually less than 24 – 48 hours but can last up to a week. Paroxysmal AF may occur only once or may be recurrent.
Persistent AF	Continuous AF that is sustained greater than 7 days.
Long-standing persistent AF	Continuous AF episode lasting 12 months or more.
Permanent AF	Permanent AF is when there has been a joint decision by the patient and clinician to cease further attempts to restore and/or maintain sinus rhythm. Acceptance of AF represents a therapeutic attitude on the part of the patient and clinician rather than an inherent pathophysiological attribute of the AF.

Pathophysiology

"Primary AF" refers to AF in the context of an established pathophysiological process. Abnormalities and damage to the heart's structure are the most common causes of AF.

"Secondary AF" indicates AF occurring in the context of a self-limited precipitant and can be further sub-classified based on the underlying etiology and likelihood for AF recurrence.

Classification of Atrial Fibrillation



Credit: Dr. Jason Andrade

Appendix B: Risk Factors for the Development of AF

Established Risk Factors	Emerging Risk Factors	Potential Risk Factors
• Advancing age • Male sex • Hypertension • HFrEF • Valvular heart disease • Thyroid disease (overt) • OSA • Obesity • Excessive alcohol intake • Congenital heart disease (e.g., early repair of atrial septal defect)	• Prehypertension and increased pulse pressure • COPD • HFpEF • Subclinical hyperthyroidism • CAD • Morphometric (increased height, and birth weight)	• Familial/genetic factors • Tobacco use • Left atrial dilatation • LV hypertrophy • Inflammation • Diabetes • Pericardial fat • Subclinical atherosclerosis • CKD • Excessive endurance exercise • Electrocardiographic (atrial conduction delay, PR interval prolongation)

Abbreviations: **CAD** – Coronary Artery Disease , **CKD** – Chronic Kidney Disease, **COPD** – Chronic obstructive pulmonary disease, **HFpEF** – HF with Preserved Ejection Fraction, **HFrEF** – Heart Failure with Reduced Ejection Fraction, **OSA** – Obstructive Sleep Apnea.

Appendix C: Assessing Atrial Fibrillation Symptom Severity with the CCS-SAF Scale

The 3 steps of the Canadian Cardiovascular Society (CCS) Severity of Atrial Fibrillation (SAF) Scale:

Step 1: Symptoms

Identify the presence of the following symptoms:

A. Palpitations

B. Dyspnea

C. Dizziness, presyncope, or syncope

D. Chest pain

E. Weakness or fatigue

Step 2: Association

Is AF, when present, associated with the symptoms (A – E) listed above?

Ascertain if any of the above symptoms are present during AF and likely caused by AF.

Step 3: Functionality

Determine if the symptoms associated with AF (or the treatment of AF) affect the patient's functionality (subjective quality of life).

The CCS-SAF Scale:

Class	Definition
0	Asymptomatic with respect to AF.
1	Symptoms attributable to AF have minimal effect on patient's general quality of life: • minimal and/or infrequent symptoms; or • single episode of AF without syncope or heart failure.
2	Symptoms attributable to AF have minor effect on patient's general quality of life: • mild awareness of symptoms in patients with persistent/permanent AF; or • rare episodes (e.g., less than a few per year) in patients with paroxysmal or intermittent AF.
3	Symptoms attributable to AF have moderate effect on patient's general quality of life: • moderate awareness of symptoms on most days in patients with persistent/permanent AF; or • more frequent episodes (e.g., more than every few months) or more severe symptoms, or both, in patients with paroxysmal or intermittent AF.
4	Symptoms attributable to AF have severe effect on patient's general quality of life: • very unpleasant symptoms in patients with persistent/paroxysmal AF; and/or • frequent and highly symptomatic episodes in patients with paroxysmal or intermittent AF; and/or syncope thought to be due to AF; and/or • congestive heart failure secondary to AF.

Reference:

1. Dorian P, Cvitkovic SS, Kerr CR, et al. A novel, simple scale for assessing the symptom severity of atrial fibrillation at the bedside: The CCS-SAF Scale. Can J Cardiol. 2006;22:383-386

Appendix D: Stroke Risk Assessment in Atrial Fibrillation – $CHADS_2$ and CHA_2DS_2-VASc Scores

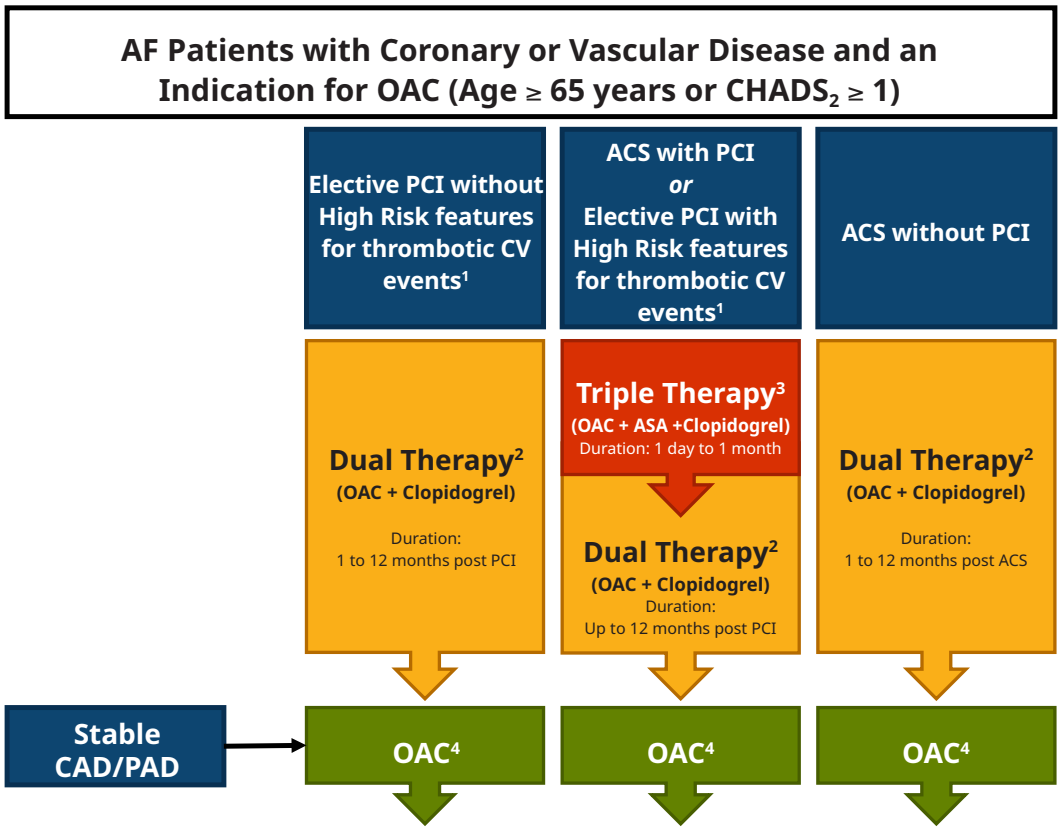
The following tables are provided to aid patient counselling for or against anticoagulants usage in atrial fibrillation (AF) for the prevention of stroke. The annual risk of stroke or systemic embolism is estimated from calculating the $CHADS_2$ or the CHA_2DS_2-VASc score.[12–14]

$CHADS_2$		
Letter	**Clinical Characteristic**	**Score**
C	Congestive heart failure	1
H	Hypertension	1
A	Age 75+	1
D	Diabetes mellitus	1
S	Prior stroke or TIA or systemic thromboembolism	2
Maximum score		6

CHA_2DS_2-VASc		
Letter	**Clinical Characteristic**	**Score**
C	Congestive heart failure	1
H	Hypertension	1
A2	Age 75+	2
D	Diabetes mellitus	1
S2	Prior stroke or TIA or systemic thromboembolism	2
V	Vascular disease (history of MI, peripheral arterial disease, or aortic atherosclerosis)	1
A	Age 65 – 74	1
Sc	Female sex category	1
Maximum score		9

$CHADS_2$ Score	Unadjusted rate of ischemic stroke without anticoagulation (% per year)	CHA_2DS_2-VASc Score	Unadjusted ischemic stroke rate without anticoagulation (% per year)
0	0.6	0	0.2
1	3.0	1	0.6
2	4.2	2	2.2
3	7.1	3	3.2
4	11.1	4	4.8
5	12.5	5	7.2
6	13.0	6	9.7
		7	11.1
		8	10.8
		9	12.2

Appendix E: Management of Antithrombotic Therapy in Patients with AF And CAD/PAD (reproduced with permission from CCS 2020 guidelines)



1 PCI is considered high-risk based on clinical and angiographic features such as: diabetes mellitus, current smoker, chronic renal dysfunction (eGFR < 60 mL/min), prior ACS, multi-vessel disease, multiple stents implanted, complex bifurcation lesion, total stent length > 60 mm, prior stent thrombosis, chronic total occlusion intervention, or bioabsorbable vascular scaffold.

2 The OAC component evaluated as part of dual pathway therapy regimens include: warfarin daily, apixaban 5 mg BID (reduced to 2.5 mg if they met two or more of the following dose-reduction criteria: age > 80 years of age, weight < 60 kg, or Cr > 133 µmol per liter), dabigatran 110 mg or 150 mg PO BID, edoxaban 60 mg PO daily (30 mg in patients with CrCl 15–50 mL/min, bodyweight ≤ 60 kg, or concomitant use of specified potent P-glycoprotein inhibitors), rivaroxaban 15 mg PO daily (10 mg in patients with CrCl 30-50 mL/min). A DOAC is preferred over warfarin, however if warfarin is to be used the lower end of the recommended INR target range is preferred. All patients should receive a loading dose of ASA 160 mg at the time of PCI (if previously ASA naïve).

3 The OAC component evaluated as part of triple therapy regimens include: warfarin daily, rivaroxaban 2.5 mg PO BID, or apixaban 5 mg BID (reduced to 2.5 mg if they met two or more of the following dose-reduction criteria: age > 80 years of age, weight < 60 kg, or Cr > 133 µmol per liter). A DOAC is preferred over warfarin, however if warfarin is to be used the recommended INR target is 2.0-2.5. All patients should receive a loading dose of ASA 160 mg at the time of PCI (if previously ASA naïve). Thereafter, ASA may be discontinued as early as the day following PCI or it can be continued longer. The timing of when to discontinue ASA will depend on individual patient's ischemic and bleeding risk.

4 The dose of OAC beyond one year after PCI should be standard stroke prevention doses. A combination of an OAC and single antiplatelet therapy may be used only in highly-selected patients with high-risk features for ischemic coronary outcomes, and who are also at low risk of bleeding.

Appendix F: Prescription Medication Tables for Atrial Fibrillation

See BCGuidelines: DOAC and Warfarin guidelines for dosing and therapeutic considerations of these drugs.

Generic Name *Trade name* Dosage form and strengths	**Recommended Adult Dose**[A]	**Approx. Cost per 90 days**[B]	**PharmaCare Coverage**[C]	**Adverse Events**[D]	**Therapeutic Considerations**[D]
Drugs for heart rate control					
Beta-blockers (BB)					
Atenolol *Tenormin, generics* Tabs: 25, 50, 100 mg	Initial: 25 mg daily[1] Usual: 50 to 150 mg daily[2] Max: 200 mg daily[3]	$10 to 25	Regular benefit	Bradycardia, hypotension, bronchospasm, fatigue, depression[2]	Contraindicated:[5] • severe/poorly controlled asthma • 2nd/3rd degree heart block without pacemaker • PR > 0.24 sec • decompensated HF • symptomatic bradycardia • symptomatic hypotension • severe PAD *For LVEF ≤ 40%: use bisoprolol, metoprolol, carvedilol[1] Atenolol associated with increased mortality[5] Carvedilol less effective for rate control than metoprolol[5] Lower HR at rest and exercise, but no change in exercise capacity[5] β-1 selective (less potential for bronchospasm): atenolol, bisoprolol, metoprolol[2] Drug interactions (DI): synergistic with digoxin, CCB, amiodarone (may require dose reduction). Antidiabetic agents (may mask hypoglycemia). Beta blocker Dose Approximate Equivalence[9] Beta blocker / Dose Approximate Equivalence Atenolol: 50 mg Bisoprolol: 5 mg Carvedilol: 25 mg Metoprolol: 100 mg Nadolol: 80 mg Propranolol: 80 mg
Bisoprolol* *Monocor, generics* Tabs: 5, 10 mg	Initial: 2.5 mg daily[1] Usual: 2.5 to 10 mg daily[2] Max: 20 mg daily[4]	$5 to 10	Regular benefit		
Metoprolol* *Lopressor, generics* Tabs: 25, 50, 100 mg SR tabs: 100, 200 mg Injectable solution: 1 mg/mL	Acute care setting[1]: 2.5 to 5 mg iv over 2 min, then q5min x 3 prn Outpatient setting: Initial: 12.5 to 25 mg po bid[1] Usual: 25 to 200 mg po bid or 100 to 200 mg SR po daily[5] Max: 400 mg po daily in divided doses[6]	$15 to 50	Regular benefit		
Nadolol *Cogard, generics* Tabs: 40, 80, 160 mg	Initial: 40 mg daily[1] Usual: 80 to 160 mg daily[1] Max: 160 mg bid[5]	$35 to 130	Regular benefit		
Propranolol *Inderal, generics* Tabs: 10, 20, 40, 80 mg Liquid: 3.75 mg/mL Injectable solution: 1mg/mL	Acute care setting[2]: 1 to 3 mg iv q2min x 2 prn (may repeat in 4 h) Outpatient setting: Initial: 40 mg po bid[1] Usual: 80 to 120 mg po bid Max: 160 mg bid	$45 to 75	Regular benefit		
Carvedilol* *Coreg, generics* Tabs: 3.125, 6.25, 12.5, 25 mg	Initial: 6.25 mg bid[1] Max: 25 mg bid[8]	$45	Limited coverage		

Generic Name *Trade name* Dosage form and strengths	Recommended Adult Dose[A]	Approx. Cost per 90 days[B]	PharmaCare Coverage[C]	Adverse Events[D]	Therapeutic Considerations[D]
Non-dihydropyridine calcium channel blockers (ND – CCB)					
Diltiazem *Tiazac, generics* Tabs: 30, 60 mg CD caps/Tiazac XC tabs: 120, 180, 240, 300, 360 mg Injectable solution: 5 mg/mL	Acute care setting:[1] 0.25 mg/kg iv; a second bolus of 0.35 mg/kg may be given in 15 min prn Outpatient setting: Initial: 30 mg po q6h to q8h or 120 mg CD/XC daily[1] Usual/Max: 120 to 360 mg CD/XC daily (dose divided q6h or q8h for immediate release tabs)[10]	$35 to 60	Regular benefit	Headache, **edema**, dizziness, bradycardia, flushing[10]	Contraindicated:[10] • severe bradycardia (< 40 BPM) • hypotension (SBP < 90 mmHg) • Sick Sinus Syndrome (without pacemaker) • 2nd/3rd degree AV block • MI with left ventricular failure • Concomitant use with ivbradine, dantrolene May be preferred for active patients, since less fatiguing than beta blockers[5] DI results in ↑ concentration/effect(s): amiodarone, digoxin, beta blockers, cyclosporine, lithium[10] DI results in ↓ concentration/effect(s): carbamazepine[1]
Verapamil *Isoptin, generics* IR tabs: 80, 120 mg SR tabs: 120, 180, 240 mg Injectable solution: 2.5 mg/mL	Acute care setting:[1] 5 to 10 mg (0.075 mg to 0.15 mg/kg) iv over 2 min Outpatient setting: Initial: 40 mg po tid or 120 mg SR daily[2] Usual/Max: 120 mg daily to 240 mg bid[5]	$50 to 335	Regular benefit	Headache, dizziness, hypotension, **constipation**, nausea[11]	Contraindicated:[11] • severe bradycardia/hypotension • Sick Sinus Syndrome • 2nd/3rd degree AV block • severe MI with left ventricular failure • severe CHF (EF < 40%) • Concomitant use with ivbradine, flibanserin May be preferred for active patients since less fatiguing than beta blockers[5] DI: avoid with beta blockers in pts with poor ventricular function, grapefruit juice DI results in ↑ concentration/effect(s): alpha blockers, dabigatran, digoxin, carbamazepine, colchicine, doxorubicin, lithium[11] DI results in ↓ concentration/effect(s): phenytoin, rifampin[11]
Digoxin					
Digoxin *Toloxin, generics* Tabs: 0.0625, 0.125, 0.25 mg Oral solution: 0.05 mg/mL Injectable solution: 0.25 mg/mL	Acute care setting:[1] Loading dose: 10 to 15 mcg/kg in divided doses (e.g., 0.5 mg iv, then 0.25 mg iv q6 to 8h for 2 doses)[1] Outpatient setting: Initial: 0.125 mg po daily (loading not usually necessary)[1] Usual/Max: 0.125 to 0.25 mg po daily[1]	$20 to 40	Regular benefit	CNS: visual disturbances (blurred/yellow vision), headache, weakness Cardiac: arrhythmias (many are dose-dependent) GI: nausea, vomiting, diarrhea, anorexia[12]	Contraindicated: ventricular fibrillation Use with caution in elderly (consider lower initial dose), CKD and concomitant K+ wasting diuretic, e.g., furosemide[1] DI results in ↑ concentration/effect(s): amiodarone, macrolide antibiotics, e.g., clarithromycin, CCBs, cyclosporine, dronedarone, propafenone, azole antifungals[12] DI results in ↓ concentration/effect(s): aluminum or magnesium-containing antacids, doxorubicin, bupropion[12] Serum trough concentration used to monitor for toxicity, although signs of toxicity may occur < 1.5 nmol/L

Generic Name *Trade name* Dosage form and strengths	Recommended Adult Dose[A]	Approx. Cost per 90 days[B]	PharmaCare Coverage[C]	Adverse Events[D]	Therapeutic Considerations[D]
Drugs for heart rhythm control					
Class 1A Antiarrhythmics					
Procainamide *Pronestyl, generics* Injection: 100 mg/mL	Acute care setting:[1] 15 to 18 mg/kg iv over 30 to 60 min (usual dose 1 g over 1 hour)	N/A	Non- benefit	Hypotension, bradycardia, ventricular proarrhythmia[1]	Contraindicated/avoid use:[1] • Hypotension • Ischemic heart disease • HF • Conduction system disease • Brugada syndrome Efficacy similar to amiodarone. Less efficacious than Class 1C and other Class III antiarrhythmics. Time to conversion: 1 hour Suggested monitoring: 1 hour post infusion
Class 1C Antiarrhythmics					
Flecainide *Tambocor, generics* Tabs: 50, 100 mg	Pill in the Pocket:[1] Give one immediate release: diltiazem 60 mg/verapamil 80 mg/metoprolol 25 mg tablet 30 min prior to: 200 mg po (≤ 70 kg) **OR** 300 mg po (> 70 kg) Rhythm control: Initial: 50 mg bid[13] Usual: 50 to 100 mg bid Max: 150 mg bid[13]	$30 to 55	Regular benefit	CNS: nausea, asthenia, tremor, dizziness, headache Ophthalmic: blurred vision, corneal deposit, dry eyes, photopsia[5] CV: arrhythmias, hypotension	Contraindicated/avoid use:[1] • Advanced atrioventricular or infranodal conduction disease • Marked sinus bradycardia • Ischemic heart disease (active ischemia or history of MI) • Clinical heart failure or LVEF (≤ 40%) • Brugada syndrome • LVH (ECG or echo) with repolarization abnormality (ECG) DI: avoid with other antiarrhythmic agents, QTc prolonging agents. Time to conversion: 2 to 6 hours[1] Suggested monitoring: 6 hours post administration[1] ECG parameter for discontinuing: QRS duration increases > 25% from baseline or to > 150 msec, PR interval > 200 msec[1]
Propafenone *Rythmol, generics* Tabs: 150, 300 mg	Pill in the Pocket:[1] Give one immediate release: diltiazem 60 mg/verapamil 80 mg/metoprolol 25 mg tablet 30 min prior to: 450 mg po (≤ 70 kg) **OR** 600 mg po (> 70 kg) Rhythm control: Initial: 150 mg daily[5] Usual: 150 mg tid[5] Max: 300 mg tid[1]	$90	Regular benefit	CNS: dizziness, anxiety fatigue CV: arrhythmias, chest pain, edema, palpitations, hypotension GI: altered taste, constipation, nausea/vomiting, dyspnea[5] Agranulocytosis (< 0.1%)[5]	Contraindicated/avoid use:[1] • Advanced atrioventricular or infranodal conduction disease • Marked sinus bradycardia • Ischemic heart disease (active ischemia or history of MI) • Clinical heart failure or LVEF (≤ 40%) • Brugada syndrome • Severe hepatic impairment • Myasthenia gravis • LVH (ECG or echo) with repolarization abnormality (ECG) DI: avoid with amiodarone DI results in ↑ concentration/effect(s): beta-blockers, venlafaxine, warfarin, SSRIs, may require dose reduction[5] Time to conversion: 2 to 6 hours Suggested monitoring: 6-hours post administration ECG parameter for discontinuing: QRS duration increases > 25% from baseline or to > 150 msec, PR interval > 200 msec[1]

Generic Name *Trade name* Dosage form and strengths	Recommended Adult Dose[A]	Approx. Cost per 90 days[B]	PharmaCare Coverage[C]	Adverse Events[D]	Therapeutic Considerations[D]
Class III Antiarrhythmics					
Amiodarone *Cardarone, generics* Tabs: 100, 200 mg Injectable solution: 50 mg/mL	Acute care setting:[1] 150 mg iv bolus then 60 mg/h x 6 hours then 30 mg/h x 18 hours Rhythm control: 100 to 200 mg po daily[1]	$40 to 85	Regular benefit	CNS: abnormal gait/coordination, dizziness, paresthesia/ neuropathy, fatigue, tremor, insomnia Ophthalmic: corneal/micro-deposit, visual disturbances CV: bradycardia, hypotension, bradyarrhythmia DERM: blue skin, photo-dermatitis/ sensitivity GI: ↓ appetite, constipation, nausea/vomiting[5]	Contraindicated/avoid use:[1] • Advanced atrioventricular or infranodal conduction disease • Marked sinus bradycardia • Advanced pulmonary disease • Active hepatitis • Significant chronic liver disease • Pre-existing QTc prolongation • Uncontrolled thyroid dysfunction Reserved for exceptional cases when other means not feasible, preferred if reduced EF[5] 60-70% efficacy at 1 year[5] DI: avoid with azoles, cyclosporin, clarithromycin, ritonavir.[5] DI results in ↑ concentration/effect(s): beta blockers, procainamide, quinidine, warfarin (dose reduction may be warranted)[2] ECG parameter for discontinuing: QTc increases > 25% from baseline or to ≥ 500 msec[1] Monitor transaminases and thyroid function every 6 months[2]
Sotalol *Sotacor, generics* Tabs: 80, 160 mg	Initial: 40 mg po bid[1] Usual/Max: 80 to 160 mg po bid	$40 to 65	Regular benefit	Hypotension, bradycardia, wheezing, ventricular proarrhythmia -especially at higher doses or with renal dysfunction[2]	Contraindicated/avoid use:[1] • Pre-existing QTc prolongation • Marked sinus bradycardia • Advanced atrioventricular node disease • Severe renal impairment (CrCl < 40 mL/ min) • Advanced age (> 75 years) • LV dysfunction (LVEF ≤ 40%) • LVH (ECG or echo) with repolarization abnormality (ECG) 30-50% efficacy at 1 year[5] DI results in ↑ concentration/effect(s): antiarrhythmics, drugs that ↑ QTc interval[5] ECG parameter for discontinuing: QTc increases > 25% from baseline or to ≥ 500 msec[1]

Generic Name *Trade name* Dosage form and strengths	Recommended Adult Dose[A]	Approx. Cost per 90 days[B]	PharmaCare Coverage[C]	Adverse Events[D]	Therapeutic Considerations[D]
Dronedarone *Multaq* Tab: 400 mg	400 mg po bid with food[14]	$460	Limited Coverage	CNS: asthenia GI: nausea, diarrhea, abdominal pain, hepatic dysfunction (rare)[5]	Contraindicated/avoid use:[1] • HF with recent decompensation • LV dysfunction (LVEF ≤ 40%) • Long-standing persistent or permanent AF • Previous amiodarone-induced lung or liver injury • Pre-existing QTc prolongation Not recommended for rate control due to increased risk of HF, stroke and cv death[5] Less efficacious than amiodarone, but less serious AE at 1 year[5] DI: avoid with azoles, ritonavir DI results in ↑ concentration/effect(s): clarithromycin, cyclosporine, grapefruit juice DI results in ↓ concentration/effect(s): carbamazepine, phenobarbital, phenytoin, rifampin, St. John's Wort[5] ECG parameter for discontinuing: QTc increases > 25% from baseline or to ≥ 500 msec[1]

Abbreviations: **ACS** – Acute Coronary Syndrome; **AE** – Adverse Events; **BPM** – Beats Per Minute; **CAP** – Capsules; **CCB** – Calcium Channel Blockers; **CD** – Controlled Delivery; **CV** – Cardiovascular; **DERM** – Dermatological; **ECG** – Electrocardiogram; **ER** – Extended Release; **H** – Hour; **HF** – Heart Failure; **HR** – Heart Rate; **LVEF** – Left Ventricular Ejection Fraction; **LVH** – Left Ventricular Hypertrophy; **MI** – Myocardial Infarction; **N/A** – Not Applicable; **PAD** – Peripheral Artery Disease; **PRN** – Pro Re Nata (as needed); **PTS** – Patients; **SR** – Sustained Release; **Tab** – Tablets; **XR** – Extended Release.

[A] For normal renal and hepatic function. Consult product monograph for detailed dosing instructions and dose adjustments for unique patient populations.

[B] Drugs costs are average retail cost of the generic, when available, rounded up to the nearest $5. Current as of March 2023 and does not include retail markups or pharmacy fees.

[C] PharmaCare coverage as of March 2023 (subject to revision). Regular benefit: Eligible for full reimbursement*. Limited coverage: Requires Special Authority to be eligible for reimbursement*. Non-benefit: Not eligible for reimbursement. *Reimbursement is subject to the rules of a patient's PharmaCare plan, including any deductibles. In all cases, coverage is subject to drug price limits set by PharmaCare. See: www.health.gov.bc.ca/pharmacare/plans/index.html and www.health.gov.bc.ca/pharmacare/policy.html for further information.

[D] Not an exhaustive list of all adverse events, therapeutic considerations, contraindications, and drug interactions. Check product monographs (https://health-products.canada.ca/dpd-bdpp/index-eng.jsp) or an interaction checker (e.g., Lexicomp(C)) before prescribing

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