AFIB Management

OPTIMAL MANAGEMENT of ATRIAL FIBRILLATION*			
DEFINITIONS	Paroxysmal AF:	Initial or recurrent: Self terminating, lasts >30 seconds and <7 days. Usually < 24hrs- 7 days.	
Establish clinical pattern	Persistent AF:	Not self-terminating but converts with either DC shock or drugs. Usually lasts >7 days. May be recurrent.	
	Permanent (Chronic) AF:	Remains after DC shock and drug therapy.	
PREVALENCE	AF occurs in 0.4% of the general population (200,000-250,000) . Prevalence increases with age: < 1% of population < age 60 years and > 6% > age 80 years.		
ETIOLOGY	Acute causes:	Aging, alcohol, MI (if LVF/RVF/RA MI), pericarditis, thromboembolism, myocarditis, hyperthyroidism, cardiac and thoracic surgery, electrocution. Most causes are transient. Treat underlying condition and control rate.	
	Chronic causes:	Hypertension, CHD, cardiomyopathy (dilated, hypertrophic, restrictive), sleep apnea, valvular heart disease (mitral>aortic), degenerative (SSS), congenital heart disease.	
	Lone AF:	No identifiable etiology (r/o genetic/familial)	
PROGNOSIS	Non valvular AF:	Rate of ischemic stroke is 5% per year. This is 2-7 times the general population. If one considers silent strokes identified on CT scanning or MRI the rate increases to 7% per year.	
	Valvular AF:	The rate of ischemic stroke is 25% per year. This rate is 17 times that of the general population.	
	Mortality:	Patients with AF have a mortality that is double that of aged matched controls. Mortality is approximately 2% per year, increases progressively with age and is related predominantly to cardiovascular causes.	
CLINICAL EVALUATION •	• Identify syndrome: PAROXYSMAL, PERSISTENT or PERMANENT. • Determine the cause: History, physical Define associated cardiac conditions and extra-cardiac factors.		
Minimum investigations of AFib: • •	• ECG to confirm the rhythm, evidence of LVH, previous MI, pre-excitation, bundle branch block and to measure and follow the QT intervals. • CXR for heart size Echo for LVH, LV function, atrial size, cardiomyopathy, valvular disease TSH		
Additional testing of AFib: •	• TMT test for rate control and to r/o coronary ischemia. • Holter monitor to assess rate control • Cardiac event monitor for symptomatic episodes. • TEE may be required especially prior to DC shock to identify atrial thrombi. EPS for documented or suspected PSVT/ consider Aflutter ablation		
THERAPEUTIC GOALS	Rate Control	• Acute vs chronic • Digoxin, ß-blocker, rate limiting CCB, amiodarone	
	Minimize thrombo-embolic risk	See anticoagulant indications	
	Restore NSR	Acute indications	• Ischaemia • CHF • Hypotension
	Maintain NSR	Chronic indications	• Relief of symptoms. • Avoidance of tachycardia induced cardiomyopathy

RATE VS RHYTHM Flavours Rhythm Control Favours Rate Control		
CONTROL: Restore and maintain sinus rhythm for symptomatic indications.	No difference in outcomes including cardiovascular death, CHF, thromboembolism severe bleeding, pacemaker implantation or side effects of anti-arrhythmic therapy between the two strategies: AFFIRM, RACE, PIAF and STAF	
	Paroxysmal Afib	Persistent Afib
	First episode Afib	Recurrent Afib
	More symptomatic	Less symptomatic
	< 65 years of age	> 65 years of age
	No hypertension	Hypertension
	History of CHF	No history of CHF
	No previous anti-arrhythmic	Rx failure Previous anti-arrhythmic Rx failure
	Patient preference	Patient preference
CARDIOVERSION: See **ER** Cardioversion Protocol	Performed either pharmacologically or by DC cardioversion. AF duration > 48 hours increases the risk of systemicembolization. Recommendations for anticoagulation prior to DC shock or pharmacologic therapy are identical.	
ACUTE ANTI-THROMBOTIC THERAPY (t	**Anticoagulation for Paroxysmal or Persistent AF:** Patients with Paroxysmal or Persistent AF > than 48 hrs should be anticoagulated prior to cardioversion. Use warfarin to achieve an INR of 2-3. Drugs or DC shock should only be used after 3-4 weeks of therapeutic anticoagulation. Consider earlier cardioversion if TEE ransesophageal echo) shows no left atrial (usually appendage) thrombi. If conversion to NSR successful, warfarin should be continued for 3-4 weeks due to delayed return of atrial function (despite sinus rhythm). Consider continued long term risk of systemic embolization. **See Anti-coagulation Decision Aide**.	
PHARMACOLOGIC CONVERSION OF AFIB	**Ineffective drugs for conversion**	**Recommended drugs for conversion of atrial fibrillation**
	Digoxin Sotalol Verapamil Diltiazem	* Ibutilide (I.V.) [CCS Level I-A] * Flecainide (P.O.) [CCS Level I-A] Procainamide (I.V.)[CCS Level I-B] Propafenone (P.O.)[CCS Level I-B] Chronic Amiodarone [CCS II-A] Sotalol [CCS III-B]
	* Drugs best avoided by FD	
MAINTENANCE OF NSR	**Patients with structurally normal hearts:**	**Patients with structurally abnormal hearts:**
• One year recurrence rate 75% in absence of anti-arrhythmic drug • Higher risk of pro-arrhythmia with underlying structural heart disease • Amiodarone more efficacious but significant side effects • Other agents have potential for proarrhythmia in patients with underlying heart disease	• Propafenone: 150 mg BID-TID • Flecainide§: 50-150 mg BID • Sotalol*: 80-160 mg BID (dose should be adjusted for renal function and Q-Tc during in-hospital initiation phase) • Amiodarone: 200 mg OD-BID (load 600mg/day X 1 mo or 1000mg/day X 1 week) • ß-blockers: moderately effective in maintaining NSR (Metoprolol, Atenolol, Bisoprolol) Alternative: • Disopyramide, Dofetilide ** * Contra-indicated in women > 65 on diuretics (risk of Torsades de pointes)	A. CAD with normal ventricle 1st choice: Sotalol 2nd choice: Amiodarone Additional choices: Dofetilide **, Propafenone B. LV Dysfunction w or w/o CHF 1st choice: Amiodarone 2nd choice: Dofetilide ** C. Hypertension with LVH 1st choices: Sotalol, Amiodarone, Propafenone Flecainide ** Dofetilide available through Health Canada special access program § Avoid with structural heart disease, CAD or LV dysfunction
MANAGEMENT OF PERMANENT (CHRONIC) ATRIAL FIBRILLATION •	• Rate Control • Prevention of systemic embolization Consider catheter ablation or Afib ablation	
Pharmacologic Rate Control: • Improve symptoms • Control of ventricular rate to prevent tachycardia induced cardiomyopathy	• Non-dihydropyridine CCB (verapamil, diltiazem), or ß-blocker as initial rate control in young active patients [CCS Level I-B] • ß-blocker plus Digoxin in patients with CHF, [CCS Level I-C] • Consider combination therapy to minimize side effects, maximize resting and exertional rate control, and improve symptoms [CCS Level IIa-C] and improve symptoms [CCS Level IIa-C] • Adjust digoxin dose ↓ if combined with verapamil/amiodarone • Digoxin for initial rate control in the elderly or inactive [CCS Level IIa-C]	

WPW with rapid VR	• Procainamide or Ibutilide IV or DC cardioversion if unstable [CCS Level I-B]	
Non-Pharmacologic Rate Control:	• Consider AV nodal ablation and VVIR permanent pacer implantation in patients with inadequate pharmacologic rate control, persisting symptoms or anti-arrhythmic intolerance [CCS Level I-A]	
CATHETER ABLATION THERAPY FOR AFIB	**Rhythm Control**	**Rate Control**
• Results better with paroxysmal > permanent Afib • Patients who have failed one or two anti-arrhythmic drugs • LA size < 55 mm • Minimal underlying structural HD • TEE to exclude LA thrombus • Spiral CT for PV anatomy	• Patients with AFib and pre-excitation especially with syncope, rapid VR or short accessory pathway refractory period [CCS Level I-B] • Young patients with lone paroxysmal AFib [CCS Le vel IIa-B] • Patients with symptomatic recurrent paroxysmal Afib [CCS Level IIa-B]	• Patients with highly symptomatic permanent AFib with rapid VR, inadequate pharmacologic rate control or anti-arrhythmic intolerance [CCS Level I-B] • Patients with highly symptomatic paroxysmal AFib in whom rhythm control ineffective and ph armacologic rate control ineffective or not tolerated [CCS Level I-B]
AFIB FOLLOWING CARDIAC SURGERY • Afib common following heart surgery • 30% CABG patients • 40% Valve surgery • 50% combined CABG + valve surgery	• Continue ß-blocker through peri-operative period [CCS Level I-A] • Treat post-op Afib with ß-blocker, non-dihydropyridine CCB or amiodarone for ventricular rate control [CCS Level I-B] • Consider prophylactic peri-operative ß-blocker or amiodarone to prevent post-op Afib [CCS Level IIa-B] • Treat post-op Afib with rate control or rhythm control strategy [CCS Level IIa-A] • Consider anticoagulation if Afib persists > 48 hours [CCS Level IIa-C] • Reassess ongoing need for anticoagulation, rate or rhythm control at 6-8 wks.	
AFIB AND SPECIAL CIRCUMSTANCES Hypertrophic cardiomyopathy **(HCM)**	• Afib occurrence ~ 25%. Increased risk of sudden & non-sudden death, CHF & CVA • Anticoagulation indicated [CCS Level I-B] • Rhythm control preferred over rate control [CCS Level IIa-C] • Amiodarone is preferred anti-arrhythmic agent [CCS Level IIa-C]	
WPW SYNDROME	• Catheter ablation of accessory pathway recommended in symptomatic patients [CCS Level I-B] • Operative ablation recommended if catheter ablation not feasible or unsuccessful [CCS Level I-B] • Immediate electrical cardioversion for Afib with hemodynamic compromise [I-B] • Anti-arrhythmic therapy: amiodarone, sotalol, disopyramide, flecainide, propafenone, quinidine or pr ocainamide when ablation not feasible [I-C] • IV procainamide or ibutilide for H/D stable pre-excited AFib [I-C] • Verapamil, diltiazem or ß-blocker contraindicated in AFib with pre-excitation. [CCS Level III-B]. Verapamil, diltiazem or ß-blocker may be used for rate control in absence of pre-excited complexes [CCS Level I-C]	
ATRIAL FLUTTER	• Either rate or rhythm control strategy is appropriate [CCS Level I-C] • Pharmacologic agents for rate or rhythm control same as for AFib [I-C] • Use AV nodal blocking agent if Class 1C or 1A anti-arrhythmic used [I-C] • Anti-thrombotic recommendations same as for AFib [CCS Level I-C]	

SURGICAL TREATMENT OF AFIB	• Patients undergoing intra-operative AFib ablation should be anti-coagulated unless contraindication [CCS Level I-C] • Consider intra-op AFib ablation in patients with history of paroxysmal or persistent AFib undergoing MV repair/replacement [CCS Level IIa-B] • Consider intra-op AFib ablation in patients with history of paroxysmal or persistent AFib undergoing other cardiac surgery [CCS Level IIb-C] • Consider surgical AFib ablation in patients with lone AFib and refractory symptoms when other non-pharmacologic therapies have failed [IIb-C] • Re-evaluate anti-coagulant indications in patients having undergone operative AFib ablation after three months of follow-up [CCS Level IIb-C]
PACING FOR PREVENTION OF AFIB	• Consider atrial +/- ventricular pacing in patients with symptomatic bradycardia to reduce risk of paroxysmal/permanent Afib [CCS Level IIa-A] • Minimize ventricular pacing through selection of AAI or DDD pacing with long AV delay [CCS Level IIa-B] • Consider temporary atrial pacing post cardiac surgery to reduce incidence of peri-operative Afib [CCS Level IIa-B]

THERAPIES FOR THE PREVENTION OF STROKE AND OTHER VASCULAR EVENTS IN ATRIAL FLUTTER AND FIBRILLATION

RISK FACTOR STRATIFICATION	High Risk Factors	Moderate Risk Factors
• Balance risk of anti-coagulation with risk of bleeding	History of CVA/TIA	Age 65-75
	Hypertension	Diabetes
	Reduced LV Function	CAD without LV dysfunction
	Age > 75 years	
	Mitral Stenosis	
	Prosthetic Heart Valve	

ANTI-THROMBOTIC THERAPY BY RISK GROUP

RISK GROUP	Anti-thrombotic Therapy
ANY HIGH RISK FACTOR	Warfarin (Coumadin®): Target INR 2.5 (INR range 2.0-3.0)
> 1 MODERATE RISK FACTOR ASA	75-325 mg/day or Warfarin: Target INR 2.5 (INR range 2.0-3.0)
NO HIGH OR MODERATE RISK FACTORS	ASA 75-325 mg/day

Risk of Bleeding/year	ASA	Warfarin (Coumadin®)
Major hemorrhage	**0.5-1%**	**1.3%**

Intermittent AFib has equivalent risk for systemic thromboembolism as chronic AFib.

Atrial Flutter has equivalent risk for systemic thromboembolism as chronic AFib.

Anticoagulation indicated with Afib and presence of other structural heart disease: HCM (obstructive or non-obstructive), rheumatic mitral regurgitation (MR), MVP with significant MR, congenital valvular heart disease (bicuspid aortic valve with AS), idiopathic dilated cardiomyopathy or complex congenital heart disease are at high risk for stroke. Risk factor stratify in patients with other valvular conditions e.g. Aortic stenosis, aortic regurgitation.

* Adapted from Canadian Cardiovascular Society Consensus Conference: Atrial Fibrillation 2004 www.ccs.ca