Atrial Fibrillation Update

NDAFP meeting
Big Sky MT 1/14/2024
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Recommendations

1. Rate Control over Rhythm Control
   - (Strong rec/ high evidence)
2. Target Lenient rate control <110 bpm
   - (Weak rec/ low evidence)
3. Discuss Risk of Stroke & Bleeding in patients with A Fib using CHADS2 and HASBLED scores
   - (Weak rec / low evidence)
4. Prescribe chronic anticoagulation unless they are at low risk of stroke (CHADS2 <2) or have specific contraindications
   - (Strong rec / high evidence)

AAFP 2017 guidelines
https://www.aafp.org/family-physician/patient-care/clinical-recommendations/all-clinical-recommendations/atrial-fibrillation.html

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Objectives

1. **Utilize current clinical practice guidelines** for the management of AF, and the CHA_2DS_2VASc index to prescribe appropriate medications
2. Review the coagulation cascade and **compare targets of medications that affect the coagulation pathway** with specific applications to current recommendations of medications for patients with atrial fibrillation
3. Prepare **treatment plans** for patients (especially the elderly) who present with atrial fibrillation
4. Educate patients on **lifestyle modifications** they can make to ensure heart health and prevent complications from AF, including stroke or heart failure

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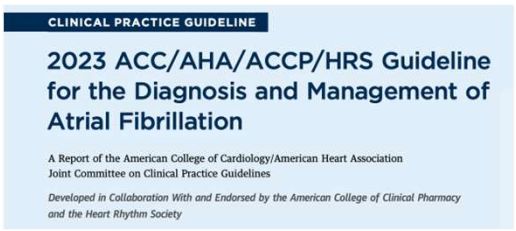

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Highlights of AF 2023

1. Stages of AF beyond previous classification based on arrhythmia duration
2. AF RF modification and prevention
3. Flexibility in using risk scores beyond CHA_2DS_2VASc for prediction of stroke in shared decision making
4. Consideration of stroke risk modifiers in evaluating risk, AF burden, and modifiable RF
5. Early rhythm control: to maintain sinus rhythm and minimize AF burden
6. Catheter ablation of AF is first line in selected patient over drug therapy

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Highlights of AF 2023

7. Catheter ablation of AF in HFrEF is now a Class 1 indication superior to drug therapy for rhythm control.
8. Device Detected AF should consider episode duration and underlying risk for thromboembolism
9. L atrial appendage occlusion devices for those with long-term contraindications to anticoagulation upgraded to 2a
10. AF identified during medical illness or surgery may be lower risk

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Atrial Fibrillation: Definitions

Term	Definition
Paroxysmal AF	AF which terminates spontaneously or with intervention within 7 days
Persistent AF	Continuous AF sustained > 7d
Long-standing persistent AF	Continuous AF > 12 m
Permanent AF	Once patient & physician decide not to attempt to restore NSR
Nonvalvular AF	In the absence of rheumatic Mitral Stenosis, mechanical or bioprosthetic valve, or valve repair

Adapted from table 3 ACC 2014 A Fib Guideline JACC vol 64. No. 21 2014

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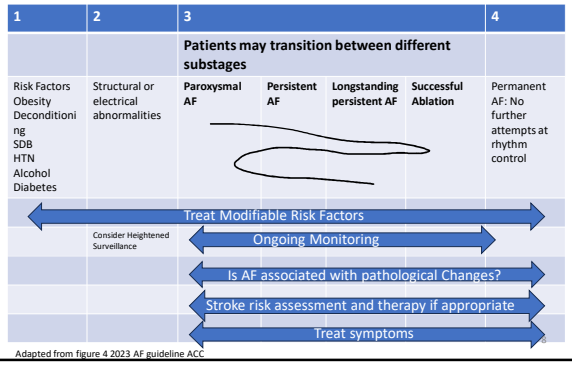
AF Stages: Evolution of Atrial Arrhythmia Progression



Adapted from figure 4 2023 AF guideline ACC

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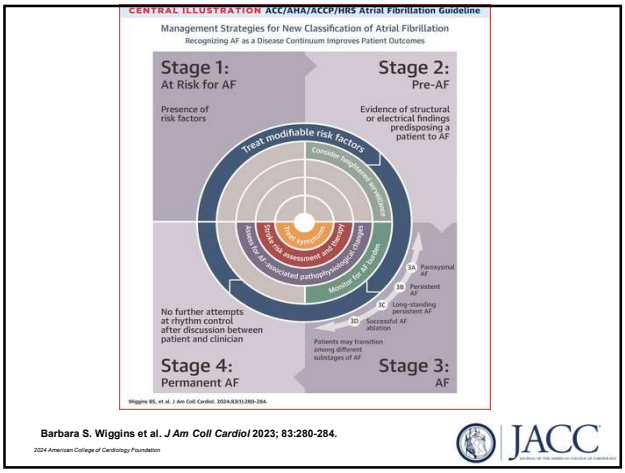

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”Chronic AF” no longer used

- Variable definitions
- Replaced by the “paroxysmal,” “persistent,” “longstanding persistent,” and “permanent” terminology
- Permanent AF

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“Lone” Atrial Fibrillation no longer used

- Individuals under age 60
- No clinical or echocardiographic evidence of disease, including HTN
- Occurs in:
  - 30-45% of those with paroxysmal AF
  - 20-25% of those with persistent AF
  - A responsible underlying condition may appear over time
- Toxic Exposure? Precipitating Illness?

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”Non-Valvular Atrial Fibrillation” going out of favor

- Initial studies for DOAC excluded those with valve replacements
- Recent Trials included those with native valvular heart disease other than mitral stenosis (mostly moderate and severe) and prosthetic heart valves to be included
- Mechanical Heart Valves continue with Warfarin recommendation

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A fib Epidemiology

- Projected increase from 5.2 million in 2010 to 12.1 million cases in 2030
- Most common arrhythmia in clinical practice
- Most common type of serious arrhythmia
- 1/3 of hospitalizations for cardiac rhythm disturbances
- 2.3 million people in US
- A fib gives a five-fold risk increase in mortality
  - CHF, Stroke, CAD….

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AF Epidemiology

- Increasing prevalence due to;
  - Aging of the population
  - Rising tide of obesity
  - Increasing detection
  - Increasing survival with AF
- $63,000 vs $28,000 annual cost for patient with and without AF
- 5.2m 2010 and 12.1m in 2030

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Outcomes

- Increased risk of stroke
- Increased severity of heart failure
- Increased mortality, especially among women
- Symptoms: Discomfort/ Palpitations / Syncope

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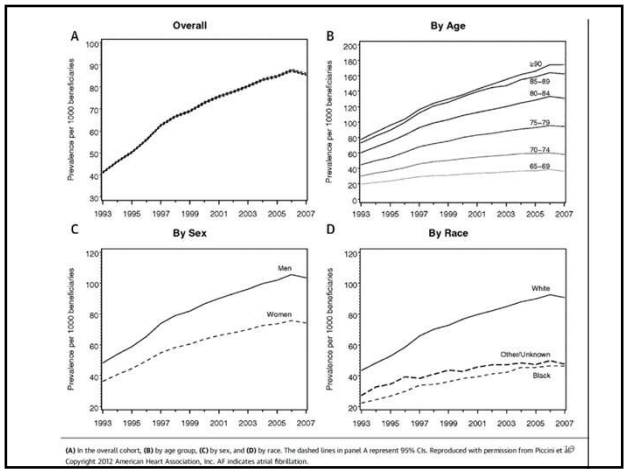

(A) In the overall cohort, (B) by age group, (C) by sex, and (D) by race. The dashed lines in panel A represent 95% CIs. Reproduced with permission from Piccini et al[9] Copyright 2012 American Heart Association, Inc. AF indicates atrial fibrillation.

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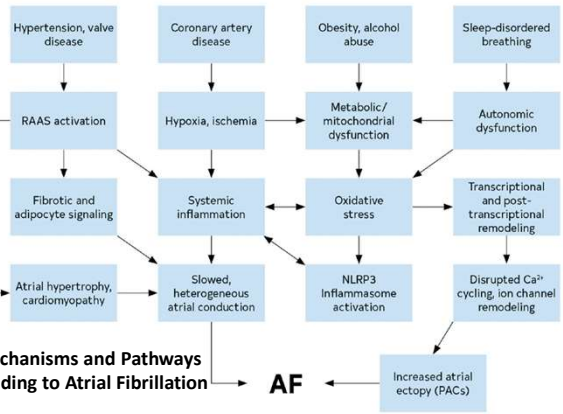

Adapted from figure 4 2023 AF guideline ACC

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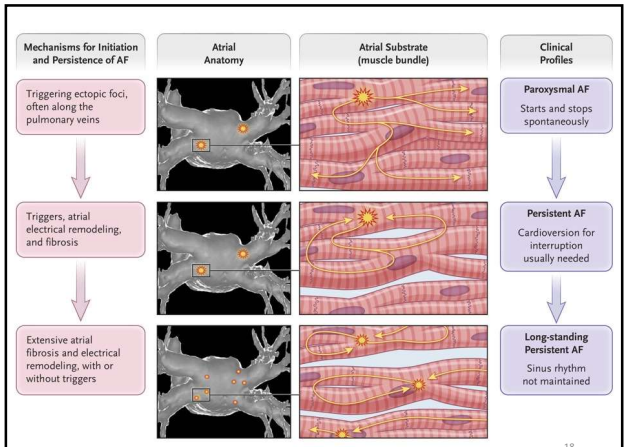

GF Michaud Stevenson WG. Atrial Fibrillation. N Engl J Med 2021;384:353-61.

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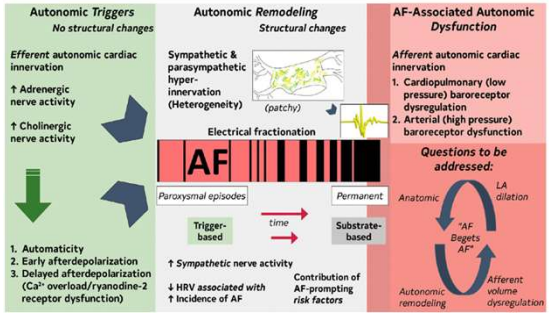
Role of the Autonomic Nervous System (ANS) in AF



Adapted from figure 4 2023 AF guideline ACC

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AF Contributors

- **Alcohol**: double risk within 4 h of one drink
  - Dose Response Gradient:
    - 1: 1.08; 2: 1.17; 3: 1.33; 4: 1.36; 5: 1.47
- **Obesity**: Pop attrib fraction 12.7%-16.9%
  - Decrease sx, burden, recurrence & progression
  - Bariatric surgery in class III obesity associated with reversal of AF type, (sinus rhythm postablation)
- **Height:** 1.28 RF increase per 10 cm
- **HTN**: PAR 21.6 1.35-1.68
  - Intensive BP control and MRA treatment decrease AF risk and burden
- **LVH** RR 1.46

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AF Contributors

- **CAD**: PAR only 5.4%, Hx MI Odds Ratio, 1.64
- **HF**: Bidirectional relation between AF and HF
- **Cardiac Surgery**: Postop AF incidence: 23.7%-25.5% of cardiac surgery patients
- **CKD**: AF causal for CKD; CKD not causal for AF
- **OSA**: (Sleep Disordered Breathing) OR 1.71
  - Dose response by severity
  - Improvement with treatment incl CPAP and weight loss
- **Sepsis**: Severe Sepsis OR 6.82

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Non Cardiac	Cardiac
Thyroid	CHF
Sleep Apnea	Dilated Cardiomyopathy
Pulmonary Embolism	Ventricular Hypertrophy
COPD & Cor Pulmonale	CAD (ischemia)
Collagen Vascular	Atrial Septal Defect
Pneumonia	Valvular disease
Illicit Drugs	Tricuspid Valve (Ebstein)
Drugs which increase QT	Post cardiac surgery
B agonist inhalers	Post ablation therapy
Lithium	Post cardiac catheterization
Antiarrhythmics	Epicardial injury
Diet Pills-Stimulants	Myocardial diseases (infectious, toxicity)

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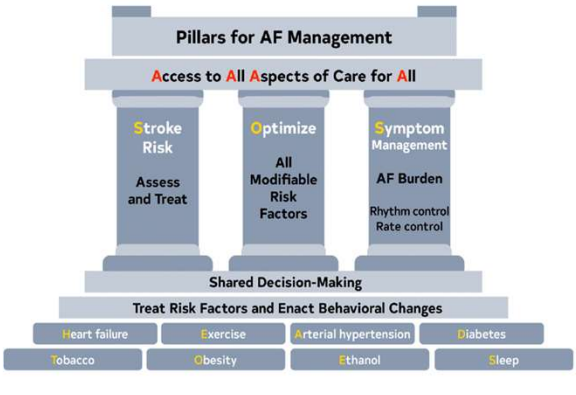

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Supraventricular Rhythms

- Supraventricular arrhythmias
  - Sinus Tachycardia (the most common)
    - Secondary rhythm (220-age) p before QRS
    - Onset and termination gradual
    - A response to a physiological event
  - Atrial flutter (transitional) 280-330 bpm
  - Atrial fibrillation (AF) irreg. irreg. 60-220 bpm
    - Detected by Sx, Physical exam (15% incidental)
    - Detected by continuous monitoring
      - Atrial pacemaker or loop recording
      - Be cautious with interpretation

Atrial Fibrillation ACC 2006 Guideline Circulation. August 15, 2006 2006;114(7):700-752

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Diagnosis

- Suspected atrial fibrillation should be confirmed with 12-lead electrocardiography
- Physical examination, electrocardiography, chest radiography, two-D echocardiography, CBC, electrolytes, liver and kidney function tests, TSH
- Screening EKG is not recommended
- Absent P, chaotic atrial activity, irregular R-R intervals, narrow QRS
- Optional: Event recorder, polysomnography, PFT
- Trans Thoracic Echo (TTE) not necessarily Trans Esophageal
- Ischemia investigations not indicated

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Rate Control

- Outpatient management appropriate unless ACS or severe volume overload (ACC 2019 and 2023)
- First Line
  - Beta blockers (e.g., metoprolol, carvedilol)
  - Non-dihydropyridine calcium channel blockers (e.g., diltiazem, verapamil)
- Second Line
  - Digoxin (0.125 daily dose in elderly, EOD in those with renal failure)
- Pacemaker
  - Ablate AV node and pace the ventricle (AVNA)
  - Alternate pacing alternatives
  - Not responsive to exercise HR demand increase

AAFP 2017 Guideline https://www.aafp.org/family-physician/patient-care/clinical-recommendations/all-clinical-recommendations/atrial-fibrillation.html

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Lenient Rate Control

- Lenient rate control (<110 beats per minute resting) over strict rate control (<80 beats per minute resting) for patients with atrial fibrillation could be considered. (110 bpm during 6 min walk)
- Strict control (<80 beats per minute resting), should be considered for symptom management.

AAFP 2017 Guideline: https://www.aafp.org/family-physician/patient-care/clinical-recommendations/all-clinical-recommendations/atrial-fibrillation.html

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Rate Control Merits

- Improves diastolic filling
- Improves coronary perfusion
- Decreases myocardial energy demand
- Prevents tachycardia-mediated cardiomyopathy
- Enhances biventricular pacing
- Reduces the risk of hospitalization

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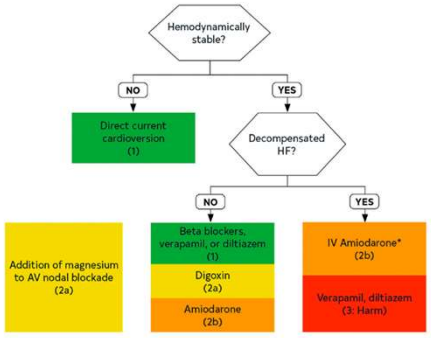
Acute Rate Control



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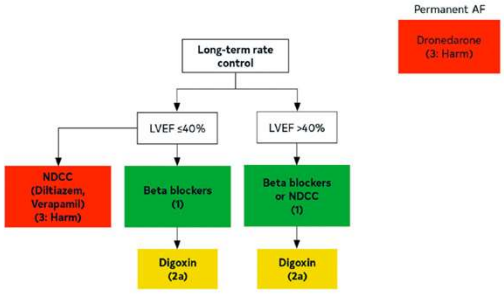
Long Term Rate Control



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Rhythm Control

- Rhythm control for A fib < 1 year
  - Reduce hospitalizations, stroke and mortality
  - Best to prevent long term complications especially in younger individuals (remodeling)
- Patients whose symptoms are not managed by rate control
- For patients with reduced EF or ischemia
- Reducing the likelihood of development of dementia or worsening cardiac structural abnormalities (evidence 2B)
- Options: amiodarone, dronedarone, propafenone, and sotalol

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Rate vs Rhythm Control: Patient Factors

	Favors Rate Control	Variable	Favors Rhythm Control
Patient Factors	Prefers rate control	Patient choice	Prefers rhythm control
	"Older"	Age	"Younger"
	Longer history of AF	Antecedent history of AF	Shorter history of AF
	Fewer symptoms	Symptom burden	More symptoms

Joglar et al 2023 AF guideline ACC adapted from fig 19

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Rate vs Rhythm Control: Clinical Considerations

	Favors Rate Control	Variable	Favors Rhythm Control
Physical Examination Anatomy	Easily controlled heart rate	Rate control in AF	Difficult to control heart rate
	Larger LA	LA size	Smaller LA
	Less LV dysfunction	LV function in AF	More LV dysfunction
	Less AV regurgitation	AV regurgitation in AF	More AV regurgitation

Joglar et al 2023 AF guideline ACC adapted from fig 19

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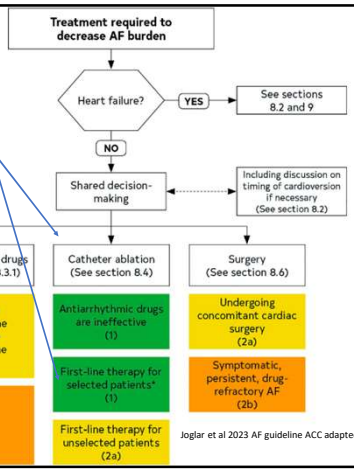
DRUGS vs ABLATION

Younger patients
With few comorbidities



Joglar et al 2023 AF guideline ACC adapted from fig 23

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Pharmacologic Conversion

- Dofetilide
- Dronadarone
- Flecanide
- Propafenone
- "pill-in-the-pocket" (PITP) approach with a single oral dose of flecainide or propafenone, with a concomitant atrioventricular nodal blocking agent,15 is reasonable
- IV Amiodarone is reasonable for pharmacological cardioversion
  - time to conversion is generally longer than with other agents (8-12 hours)

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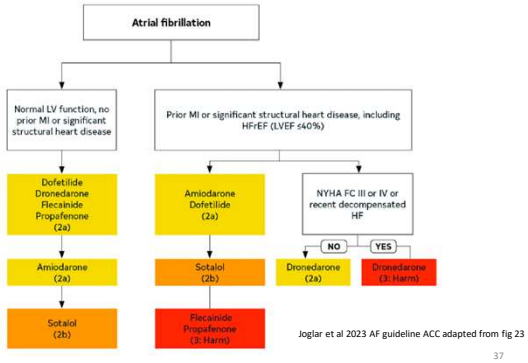
Rhythm Maintenance Therapy



Joglar et al 2023 AF guideline ACC adapted from fig 23

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Patient oriented outcomes versus theoretical outcomes

- Sinus Rhythm will have a better ejection fraction
- NSR prevents atrial remodeling and decreases the chance of being able to stay in NSR
  - But at what cost?
- It is often difficult to keep in NSR
- Medications to "convert" are have many side effects
- Patients may revert to AF after chemical, electrical or ablation therapy

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Cardioversion

- Electrical cardioversion usually successful in the short term
- Anticoagulation important prior to cardioversion
- If TEE shows no thrombus in the left atrium you do not need precardioversion anticoagulation

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Cardioversion

- Electrical cardioversion
  - Direct- current electric shock in synchrony with the QRS complex to avoid triggering ventricular brillation
  - 200 to 300 joules, may repeat
- Pharmacologic cardioversion
  - intravenous ibutilide (Corvert)
  - Flecainide (Tambocor)
  - dofetilide (Tikosyn)
  - Propafenone (Rythmol)
  - Amiodarone. (Cordarone, Nexterone, Pacerone)

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Cardiac (Electrical) Ablation

- Catheter-based procedure used to isolate and possibly destroy abnormal foci
- Sites near the pulmonary vein ostia in L atrium
- Many patients require repeat ablation and patient may revert to a fib over several years
- Many patients are required to remain on anticoagulation because of future risk of A. fib.
- Ablation therapy may be superior to antiarrhythmics in selected patients
  - Symptomatic PAF without structural heart disease
  - Intolerance for antiarrhythmics
  - Inadequate pharmacologic rhythm control

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Evolution of Electrical Ablation

- 2014 ACC guideline gave IIa recommendation as reasonable initial rhythm-control strategy[1]
- Radiofrequency energy with mixed results
- Cautious recommended for select young patients with symptomatic AF and understand benefits/risk[2,3]
- CABANA trial (2018) showed electrical ablation not superior to medication in 2200 patients[4]

[1] 2014 ACC Atrial Fibrillation Guideline Circulation. 2014;130:e199–e267
[2] Hakalahti A et al. Radiofrequency ablation vs. antiarrhythmic drug therapy as first line treatment of symptomatic atrial fibrillation: systematic review and meta-analysis Europace 2015;17;370-8
[3] 2019 ACC update of 2014 Atrial Fibrillation Guideline Circulation. 2019;140:e125–e151
4 Catheter ablation vs. antiarrhythmic drug therapy for atrial fibrillation: the results of the Cabana Multicenter International Randomized Clinical Tri
[abstract B-LBCT01-05].Heart Rhythm. 2018; 15:940–141

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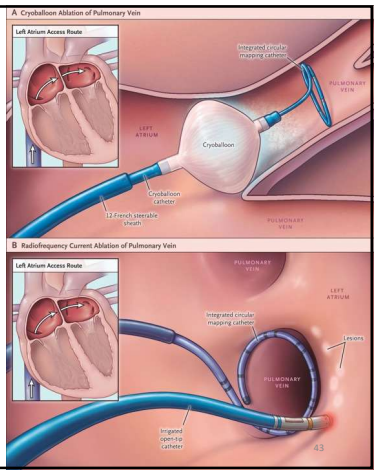
Balloon Cryoablation

- Subzero temperature to pulmonary-vein antra
- Radiofrequency catheter ablation with heat energy
  - Point-by-point connected lesions
  - Directed via 3-D navigational system



Kuck HZ et al. Cryoballoon or Radiofrequency Ablation for Paroxysmal Atrial Fibrillation
N Engl J Med 2016; 374:2235-2245

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Balloon Cryothermy Ablation

- Proposed initial intervention before pharmacological Transatrial balloon over wire, 2 hour, 1 hour in atrium for Pulm Vein isolation then cryoablation
  - Risks: atrial-esophageal fistula, PV stenosis, phrenic nerve injury, TIA, stroke, AMI and bleed
- STOP AF (203 patients)[1] adv events = at 14%
- EARLY-AF (303 patients)[2] adv events = at 4%
  - RCT for catheter ablation with cryothermy balloon
  - Lower recurrence rates and greater quality of life
- NEJM review 2021[3] Question remains as to net-safety in real life practice

[1] STOP AF N Engl J Med 2020;384:316-24
[2] Early AF Ne Engl J Med 2020; 384:305-15
[3] Early Ablation for Paroxysmal Atrial Fibrillation – Safety First Ne Engl J Med 384;4 1/28/2021

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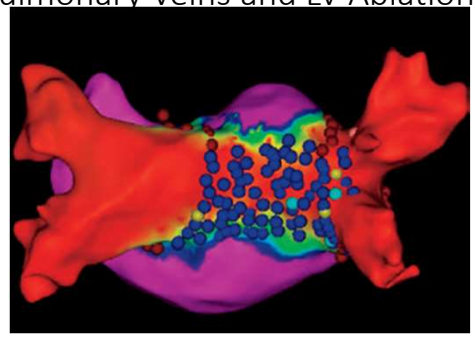
Pulmonary Veins and LV Ablation



Cryoablation or Drug Therapy for Initial Treatment of Atrial Fibrillation
J.G. Andrade and Others N Engl J Med 2021; 384:305-315

GF Michaud Stevenson WG. Atrial Fibrillation. N Engl J Med 2021;384:353-61.

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Eliminate the Atrial Appendage?

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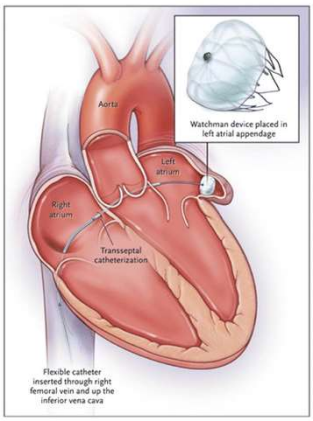
Left Atrial Appendage Occlusion

LAAOS III
Fuse Procedure

- Ablation of atrial appendage
- At the time of open heart surgery
- Or catheter based device ablation
- Only for the exceptional patient



Maisel W.H. Left Atrial Appendage Occlusion — Closure or Just the Beginning? NEJM360;25 nejm.org june 18, 2009
Image used with permission

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Shared Decision Making

- Discussion with the patient is essential to determine values and preferences before prescribing a particular anticoagulation strategy
- Explain risks, testing burden, medication adherence, and quantify stroke and bleeding risk
  - Seems overwhelming !

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Patient Preferences Doctor Preferences

- Rhythm control harder to achieve and may require more medication with an increased likelihood of side effects.
- If they are symptomatic you have to advocate for intervention
- Otherwise you need to find a way to explain quantitative risk
  - Medical literacy and numeracy show that this is difficult
  - Can't we just be paternalistic? Can we recommend…strongly?

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Thromboembolic Risk vs Bleeding Risk

- Clinicians should consider using the continuous CHADS2 or continuous CHA2DS2-VASc for prediction for risk of stroke
  - (weak recommendation, low-quality evidence) and HAS-BLED for prediction of risk for bleeding (weak recommendation, low-quality evidence) in patients with atrial fibrillation.

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CHA_2DS_2 VASc		
	Risk Factor	Score
C	Congestive heart failure	1
H	Hypertension	1
A	Age 75+	2
D	Diabetes mellitus	1
S	Prior Stroke or TIA	2
V	Vascular disease (MI, PVD or Aortic atherosclerosis)	1
A	Age 65-74	1
S	Female	1
Total Score for a maximum of 9	(1.3-15.2 annual risk)	

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Cha_2ds_2VASc	Adj. Stroke Rate / yr	$Chads_2$	Adj. Stroke Rate / yr
1	1.3	0	1.9
2	2.2	1	2.8
3	3.2	2	4
4	4	3	5.9
5	5	4	8.5
6	6	5	12.5
7	9.6	6	18.2
8	6.7		
9	15.2		

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HAS-BLED

	Condition	
H	Hypertension: (uncontrolled, >160 systolic)	1
A	Abnormal Renal: Dialysis, transplant, Cr >2.26	1
S	Stroke: Prior history of stroke	1
B	Bleeding: Prior Major Bleeding or predisposition to bleed	1
L	Labile INR (Unstable or High) <60% time therapeutic	1
E	Elderly: Age > 65	1
D	Prior Alcohol or Drug Usage (> 8 drinks/week) Medications predisposing to bleeding (Antiplatelet or NSAID)	1

Score of >3 "high risk" 3.74% / yr, 4=8.7, 5=12.5,

Lip, Gregory Y.H. Implications of the CHA2DS-VASc and HAS-BLED Scores for Thromboprophylaxis in Atrial Fibrillation. The American Journal of Medicine. 124(2): 111-4

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Recommendation

- Chronic anticoagulation unless they are at low risk of stroke (CHADS2 <2) or have specific contraindications (strong recommendation, high-quality evidence)
- Choice of anticoagulation therapy should be based on patient preferences and patient history
- Options include warfarin, apixaban, dabigatran, edoxaban, or rivaroxaban

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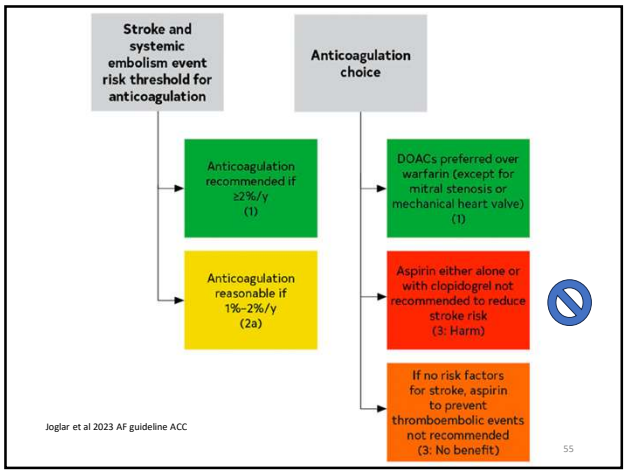

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Warfarin

- Reduce Stoke Risk, Increase Bleeding Risk ?
- How it works to inhibit Vitamin K Dependent Clotting

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History

- 1920s cattle in N. USA & Canada, striken with fatal bleeding disease. Mouldy silage from sweet clover implicated.
- N. Dakota scientist L.M. Roderick showed hemorrhagic factor
- 1940 Karl Link in Wisconsin identified 4-hydroxy coumarin
- 1948 Warfarin synthesized and approved as rodenticide in 1952
- 1954 Approved for Human Use
- WARF (Wisconsin Alumni Research Foundation)
- -arin from coumarin

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Warfarin Contraindications

- Pregnancy, except in women with mechanical heart valves
- Hemorrhagic tendencies or blood dyscrasias
- Recent or planned surgery of the central nervous system or eye, or traumatic surgery resulting in large open surfaces
- Potential high levels of noncompliance in unsupervised patients
- Hypersensitivity to warfarin
- Malignant hypertension

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Warfarin, VKA (Vitamin K Antagonist) Safe Practices

- Safe Practices
  - Algorithm
  - Frequent follow up / systems of care
  - Weekly at initiation and monthly thereafter
  - Home INR machines, (who responds)
  - Multiples of same dose (ie. 5 mg) to prevent medical errors
- Still
  - Warfarin is #1 adverse medication reactions and visits to hospital for bleeding (1-3% of patients treated)

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INR	Low Risk of Bleed	High Risk of Bleed
INR <5 No significant bleeding	Repeat INR daily, hold next dose, resume at lower dose when INR therapeutic If only .5 above could keep same dose	Repeat INR, hold warfarin, monitor INR. Consider small 1 mg po dose vitamin K
INR>=5 but <9 No sig bleeding	Repeat INR daily, hold warfarin, resume at lower dose	Repeat INR q 12 h, consider Vit K 2.5 po. (1 mg iv?)
INR> 9, no bleeding	Repeat INR daily, hold warfarin. Consider oral Vit K 2.5-5 mg. Resume at lower dose when therapeutic	Repeat INR q 12, Consider Vit K 2.5-5 mg. (IV 1-2.5 mg slowly over one hour) Repeat Vit K as necessary
Serious Bleeding at any INR	Hold warfarin. IV Vit K 10 mg over one hour. Monitor INR q 6 h. Repeat Vit K if not fully corrected in 24 h. Consider FFP 10-15 ml/kg IV, Recombinant Human factor VII or prothrombin complex concentrate	
Life Threatening Bleeding	Hold warfarin. IV Vit K over 1 h. recomb factor IV, or Prothrombin complex concentrate or FFP monitor INR q 2 h	

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Direct Oral Anticoagulants, DOAC

- (Formerly NOAC **N**ovel or **N**on Vitamin K Anticoagulants)
- 2019 ACC guideline recommends DOAC over VKA
- Direct thrombin inhibitors
  - Dabigatran etexilate (Pradaxa)
- Direct factor Xa inhibitors
  - Apixaban (Edoxaban)
  - Rivaroxaban (Xarelto)
  - Edoxaban (Sayvasa)

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Dabigatran generic Pradaxa
Dosing 150 bid Good Rx $70.00 / mo

	Reduction in Risk of Stroke	
Renal Function	Recommended Dose	Concomitant Use of P-gp Inhibitors Dronederone Ketonconazole
Normal or Mild	150 bid	150 bid
Moderate < 50 gfr	150 bid	75 bid
Severe < 30 gfr	75 bid	Avoid
V. Severe < 15 gfr	Avoid	Avoid

Goodrx 1/14/2024

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Apixaban (Eliquis) Dosing
Good Rx $615.00 / mo

- 5 mg daily 2.5 mg for patients with any two of the following:
  - age 80 years or older
  - body weight less than 133 lb (60 kg)
  - serum creatinine level of 1.5 mg per dL

Connolly SJ, Eikelboom J, Joyner C, et al. Apixaban in patients with atrial fibrillation. N Engl J Med. 2011;364(9):806–817
http://www.aafp.org/afp/2014/0415/p672.html good rx accessed 1/14/2024

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Rivaroxaban (Xarelto) Dosing
Good Rx $ 523 / mo

- **Nonvalvular Atrial Fibrillation:**
  - **CrCl >50 mL/min: 20 mg po daily with evening meal**
  - **CrCl 15 - 50 mL/min: 15 mg po daily with evening meal**
- Treatment of DVT, PE, and Reduction in the Risk of Recurrence of DVT and of PE
  - 15 mg po daily with food for the first 21 days
  - 20 mg po daily with food thereafter
- Long-term reduction in the risk of recurrence of DVT and of PE & Prophylaxis of DVT Following Hip or Knee Replacement Surgery
  - 10 mg po daily with or without food

Goodrx 1/14/2024

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Edoxaban (Savaysa) Dosing
Goodrx.com $ 429/ mo

- Cr. Cl > 50 = 60 mg po daily
- Cr. Cl < 50 = 30 mg po daily

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Choice of DOAC in Obesity

- AF and BMI > 40 although absorption concerns, still reasonable over warfarin
- After bariatric surgery warfarin may be superior due to absorption concerns

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When to stop an Anticoagulant

Anticoagulant	Low Bleeding Risk Procedure	High Bleeding Risk Procedure
Apixaban (CrCl >25 mL/min)*	1 d†	2 d
Dabigatran (CrCl >50 mL/min)	1 d	2 d
Dabigatran (CrCl 30-50 mL/min)	2 d	4 d
Edoxaban (CrCl >15 mL/min)	1 d	2 d
Rivaroxaban (CrCl >30 mL/min)	1 d	2 d
Warfarin	5 d for a target INR <1.5 2-3 d for a target INR <2	5 d

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Bridging with Heparin?

- Of 35 m patients on OAC 15-20% will need a procedure annually
- Oral Anticoagulation (OAC) should not be interrupted for procedures with low bleeding risk (dental, cataract)
- 44% overuse of bridging
- Holding oral anticoagulation and using Heparin (UFH or LMWH) for a procedure only indicated for high risk bleeding procedure (Neuraxial anesthesia or neurosurgery)

Rechenmacher SJ and Fang JC Bridging Anticoagulation Primum Non Nocere J Am Coll Cardiol 2015;66:1392-403
Kovacs RJ, Flaker GC, Saxonhouse SJ, et al. Practical management of anticoagulation in patients with atrial fibrillation.
J Am Coll Cardiol. 2015;65(13):1340-1360.
Douketis JD, Spyropoulos AC, Kaatz S, et al.; BRIDGE Investigators. Perioperative bridging anticoagulation in patients with atrial fibrillation.
N Engl J Med. 2015;373(9):823-833

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"Antidote" for major bleeding

- Usually not necessary for DOAC as bleeding effect wears off
- Intracranial bleeding is major concern
- Idarucizumab for dabigatran
- Andexanet alfa for apixaban or rivaroxaban
- Four-factor PCC for any DOAC
- For VKA, if life threatening bleeding cannot be managed with supportive measures, the rapid reversal treatment with 4-factor PCC is preferred over fresh frozen plasma

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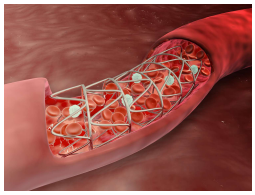
AF needing PCI (5% of pt)

- Early discontinuation of aspirin (1-4 wk) and continuation of dual antithrombotic therapy with OAC and a P2Y12 inhibitor is preferred over triple therapy (OAC, P2Y12 inhibitor, and aspirin)
- Postpone PCI if possible
- Clopidogrel over Prasugrel
- ½ dose rivaroxiban



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Triple Therapy: A fib + PCI

- Approximately 5% of patients undergoing Percutaneous Coronary Intervention, (PCI) have atrial fibrillation and require long-term oral anticoagulant therapy
  - Balance risk of bleeding with
  - Risk of stroke or stent thrombosis
- ACC 2019 update for A fib recommends
  - Clopidogrel over prasugrel if triple therapy indicated
  - Clopidogrel and low-dose rivaroxaban 15 mg is a reasonable alternative

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Summary

- Prevention:
  - Exercise, diet, weight reduction, smoking cessation, avoid unnecessary medications, avoid excess alcohol
- Evaluation:
  - Reversible causes, underlying etiology
- Intervention:
  - NSR with Ablation or pharmacotherapy
  - Permissive rate control and anticoagulation for stroke prevention

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