Updates in Atrial Fibrillation ACC/AHA Guidelines

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RECOGNITION

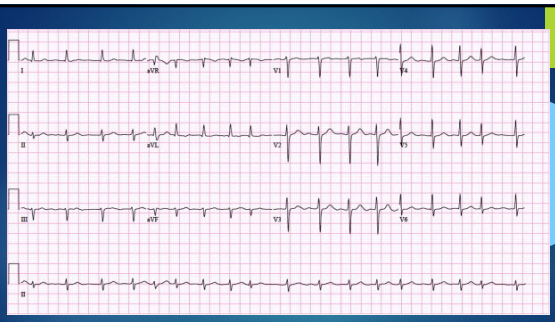
- THANK YOU TO Chief resident PAUL RAMIREZ FOR IDEA, SOME SLIDES, AND INSPIRATION FOR THIS TALK!

OBJECTIVES

- REVIEW LATEST GUIDELINES FOR THE MANAGEMENT OF ATRIAL FIBRILLAITON
- DEVELOP STRATEGIES FOR INCORPORATING EVIDENCE INTO BEST PATIENT CARE
- RECONGIZE THE INDICATIONS FOR CARDIOVERSION AND ANTICOAGULATION IN PATIENTS WITH ATRIAL FIBRILLATION

CLINICAL SCENARIO

- 55 year old woman presents to the ED complaining of palpitations and fatigue for 2 days. She denies chest pain, SOB, fever.
- No PMHx
- No Medications
- Bp135/80, HR 106, RR 18, Temp 98.8, Sat 99% on RA
- EKG Atrial Fibrillation at 106
- ? Interventions ? Further testing? Medications ? Admit? Follow up?



2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation

A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Developed in Collaboration With and Endorsed by the American College of Clinical Pharmacy and the Heart Rhythm Society

Electrical Cardioversion

COR	LOE	RECOMMENDATIONS
1	C-LD	1. In patients with hemodynamic instability attributable to AF, immediate electrical cardioversion should be performed to restore sinus rhythm.[1]
1	B-R	2. In patients with AF who are hemodynamically stable, electrical cardioversion can be performed as initial rhythm-control strategy or after unsuccessful pharmacological cardioversion.[2]
1	C-LD	3. In patients with AF undergoing electrical cardioversion, energy delivery should be confirmed to be synchronized to the QRS to reduce the risk of inducing VF.[3]
2a	B-R	4. For patients with AF undergoing elective electrical cardioversion, the use of biphasic energy of at least 200 J as initial energy can be beneficial to improve success of initial electrical shock.[4,5]
2a	B-NR	5. In patients with AF undergoing elective cardioversion, with longer duration of AF or unsuccessful initial shock, optimization of electrode vector, use of higher energy, and pretreatment with antiarrhythmic drugs can facilitate success of electrical cardioversion.[5-9]
2b	C-LD	6. In patients with obesity and AF, use of manual pressure augmentation and/or further escalation of electrical energy may be beneficial to improve success of electrical cardioversion.[10]

Prevention of Thromboembolism in Setting of Cardioversion

1	B-R	1. In patients with AF duration of ≥48 hours, a 3-week duration of uninterrupted therapeutic anticoagulation or imaging evaluation to exclude intracardiac thrombus is recommended before elective cardioversion.[1]
1	B-NR	2. In patients with AF undergoing cardioversion, therapeutic anticoagulation should be established before cardioversion and continued for at least 4 weeks afterwards without interruption to prevent thromboembolism.[3-7]

- Big change here is that 2014 guidelines stated that patients who were cardioverted should be anticoagulated following cardioversion based on thromboembolic risk.
  - Recommend anticoagulating high-risk patients.
  - Low- risk patients did not require anticoagulation.
- Now, they are now giving a more uniform recommendation to anti-coagulate everyone for at least 4 weeks!

Prevention of Thromboembolism in Setting of Cardioversion

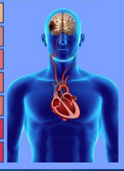
2b	C-LD	6. In patients with reported AF duration of <48 hours (not in the setting of cardiac surgery) and who are not on anticoagulation, precardioversion imaging to exclude intracardiac thrombus may be considered in those who are at elevated thromboembolic risk (CHA_2DS_2-VASc score ≥2 or equivalent).[21,22]
2b	C-LD	7. In patients with low thromboembolic risks (CHA_2DS_2-VASc 0-1 or equivalent) and AF duration of <12 hours, the benefit of precardioversion imaging or pericardioversion anticoagulation is uncertain given the low incidence of pericardioversion thromboembolic events in this population.[21,22]

- Concern for underestimation of duration of symptoms and emerging data that risk of thromboembolism in patients with symptoms <48 hours is not homogenously low.
- Retrospective data showing patients with CHA2DS2-VASc ≥2 may benefit from precardioversion imaging.
- Low CHA2DS2-VASc patients with symptoms <12 hours are particularly low risk for thromboembolism.
- No clear recommendations on patients with CHA2DS2-VASc of 0 or 1 and Afib duration >12 hours.

CHA_2DS_2 – VASc Score for Atrial Fibrillation Stroke Risk

CHF	+1
Hypertension	+1
Age ≥75	+2
Diabetes	+1
Stroke/TIA/VTE	+2
Vascular Disease	+1
Age 65-74	+1
Sex (female)	+1

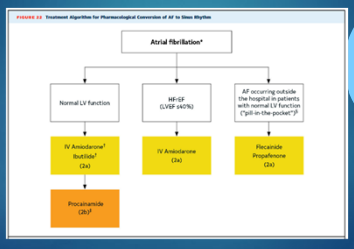
Score	Risk of stroke	
0	0.2%	Low
1	0.6%	Moderate
2	2.2%	High
3	3.2%	
4	4.8%	
5	7.2%	
6	9.7%	
7	11.2%	
8	10.8%	
9	12.2%	



Take Home Points for Electrical Cardioversion

- Synchronized cardioversion is first line therapy for unstable patients **in which instability is attributed to the atrial fibrillation.**
- Consider cardioversion for stable patients with atrial fibrillation.
- Patients need anticoagulation before cardioversion if >48 hours of symptoms.
- **Anticoagulate for 4 weeks after cardioversion.**
- Consider imaging prior to cardioversion if not on anticoagulation and high risk for thromboembolism even if symptoms <48 hours.

Overview of Pharmacological Conversion of Atrial Fibrillation



Pharmacological Conversion

COR	LOE	RECOMMENDATIONS
2a	C-LD	1. For patients with AF, pharmacological cardioversion is reasonable as an alternative to electrical cardioversion for those who are hemodynamically stable or in situations when electrical cardioversion is preferred but cannot be performed.[1]

- No studies comparing electrical vs pharmacological cardioversion in patients who are unstable.
- In stable patients, pharmacological cardioversion was less effective than electrical cardioversion.
- Pharmacological conversion may be preferred in patients who cannot easily undergo electrical cardioversion such as if they cannot tolerate anesthesia.

Pharmacological Conversion – Ibutilide and Amiodarone

2a	A	2. For patients with AF, ibutilide[2,3] is reasonable for pharmacological cardioversion for patients without depressed LV function (LVEF <40%).
2a	A	3. For patients with AF, intravenous amiodarone is reasonable for pharmacological cardioversion, although time to conversion is generally longer than with other agents (8-12 hours).[4-8]

- Ibutilide is effective at converting to sinus rhythm effectively within 30-90 minutes but there is increased risk of Tosades de Pointes and QTc prolongation.
  - Risk is higher in patients with moderately to severely decreased EF.
- Multiple RCTs have found IV Amiodarone is effective for pharmacological conversion, but it is generally slower than ibutilide.
  - Can be used in patients with HFrEF.

Pharmacological Conversion - Procainamide

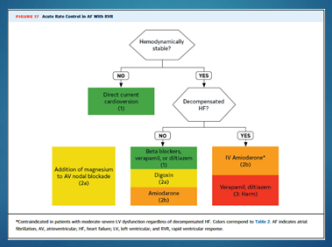
2b	B-R	5. For patients with AF, use of intravenous procainamide may be considered for pharmacological cardioversion when other intravenous agents are contraindicated or not preferred.[19]

- IV procainamide is more effective than placebo for conversion to sinus rhythm. (conversion rates at 1 hour, 69% vs 38%).
- IV procainamide is less effective than ibutilide at conversion of AF to sinus rhythm.
- Patients can experience hypotension and drug can exacerbate HFrEF.

Take Home Points for Pharmacological Conversion

- Pharmacological conversion is effective although less so than electrical cardioversion.
- Ibutilide is effective and fast but cannot be used in patients with HFrEF and may cause Torsades!
- Amiodarone is effective but slower and can be used in a wider patient population.
- Procainamide is an option but it appears less effective than ibutilide.

Overview of Acute Rate Control of Atrial Fibrillation



Acute Rate Control – BB/CCB

COR	LOE	RECOMMENDATIONS
1	B-R	1. In patients with AF with rapid ventricular response who are hemodynamically stable, beta blockers or nondihydropyridine calcium channel blockers (verapamil, diltiazem; provided that EF >40%) are recommended for acute rate control (Figure 17).[1-6]

- You can use either beta blockers or CCB for acute rate control.
- The mention of EF >40% is new.
- Dosing recommendations:
  - Metoprolol Tartrate - IV 2.5-5 mg bolus over 2 min; up to 3 doses
  - Esmolol - 500mg/kg bolus over 1 min; then 50-300mg/kg/min
  - Diltiazem - 0.25 mg/kg (actual body weight) IV over 2 min; May repeat 0.35 mg/kg over 2 min; then 5-15 mg/h continuous infusion

Acute Rate Control - Magnesium

2a	A	3. In patients with AF with rapid ventricular response, the addition of intravenous magnesium to standard rate-control measures is reasonable to achieve and maintain rate control.[10,11]

- Mechanism is likely blockade of slow inward calcium channels in SA and AV nodes slowing heart rate and causing conduction delay.
- Low side effect profile and generally well tolerated
- Meta-analysis of 6 RCTs looking at IV magnesium given in combination with standard rate control medications compared to standard methods
  - Improved rate control (63% versus 40%; OR, 2.49 [95% CI, 1.80-3.45])
  - Modest improvement at conversion to sinus rhythm (21% versus 14%; OR, 1.75 [95% CI, 1.08-2.84])
  - There was superiority in subgroup analysis for <5g (24% versus 13%) compared to >5g (16%versus13%) for rhythm control compared to placebo.

Acute Rate Control - Amiodarone

2b	B-NR	4. In patients with AF with rapid ventricular response who are critically ill and/or in decompensated HF in whom beta blockers and nondihydropyridine calcium channel blockers are ineffective or contraindicated, intravenous amiodarone may be considered for acute rate control.[e12,13]

- This is not a significant change from 2014 guidelines.
- One retrospective study of 38 ICU patients compared amiodarone to IV diltiazem or digoxin.
  - Significant decrease in heart rate without decrease in BP using amiodarone.
- Another study of 60 critically ill patients with heart rate >120 in Afib compared dilt bolus + infusion, amiodarone bolus, and amiodarone bolus +infusion.
  - Sufficient rate control achieved with both drugs.
  - Diltiazem had more hypotension requiring discontinuation.
- Dosing: 150-300 mg IV over 1 h, then 10-50 mg/h over 24 h

Acute Rate Control - Digoxin

2a	B-R	2. In patients with AF with rapid ventricular response in whom beta blockers and nondihydropyridine calcium channel blockers are ineffective or contraindicated, digoxin can be considered for acute rate control, either alone or in combination with the aforementioned agents.[1-9]

- One multicenter RCT showed digoxin was effective compared to placebo at rate control.
  - Other agents may be safer and more effective.
- In multiple small RCTs, both IV diltiazem and IV amiodarone were more effective at achieving rate control
- One small RCT which compared IV diltiazem and digoxin vs IV diltiazem which showed improved rate control with combination.
- Dosing recommendations:
  - 0.25-0.5 mg over several min; repeat doses of 0.25 mg every 6 h (maximum 1.5 mg/24 h)
- Onset of action is significantly slower than other agents but it is more hemodynamically neutral.

Acute Rate Control – CCB & HFrEF

3: Harm	B-NR	5. In patients with AF with rapid ventricular response and known moderate or severe LV systolic dysfunction with or without decompensated HF, intravenous nondihydropyridine calcium channel blockers should not be administered.[34,35]

- Key difference is recommendation of harm **with or without** decompensated Heart Failure.
  - Due to presumed negative ionotropic effects of CCBs.
- Retrospective chart review of 635 patients who received IV diltiazem
  - increased rates of AKI for patients with EF <50% compared to normal EF
- Second retrospective review of 125 patients comparing CCB to BB
  - No difference in total adverse events
  - Increased incidence of worsening HF symptoms defined as increasing O2 requirement or initiation of ionotropic support.
- Neither study showed differences in in-hospital mortality, need for higher level of care, or hypotension.

Take Home Points for Rate Control

- For stable patients without a history of HFrEF, either beta blockers or calcium channel blockers are effective options.
- IV magnesium is a low risk medication that may help with both rate and rhythm control.
- Consider amiodarone or digoxin for patients in who beta blockers and calcium channel blockers are ineffective or contraindicated.
- Calcium channel blockers should not be used in HFrEF regardless of whether or not there is decompensation.

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Special Populations

- High risk of CVA
- High risk of GI Bleed (HAS-BLED)
- WPW – A. Fib with wide complex rate 170—300, needs cardioversion or procainamide, all else might kill
- Rate is not from A. Fib – dehydration, sepsis, thyrotoxicosis
- Severe valvular disease or artificial valve should be anticoagulated with Coumadin, everyone else DOAC preferred

Score > 2, increased risk of bleeding

Condition	Points
H – Hypertension	1
A – Ab(N) liver/renal	1 point each
S – Stroke	1
B – Bleeding	1
L – Labile INRs	1
E – Elderly (>65)	1
D – Drugs or ETOH	1 point each

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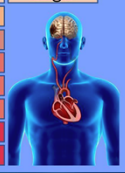
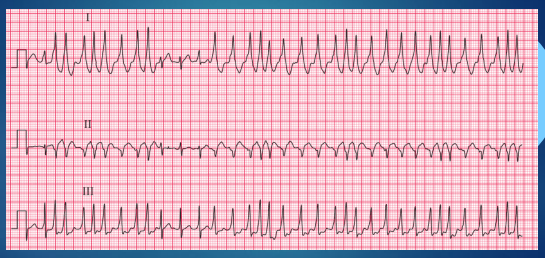


WPW



Final Thoughts

- Are they stable or unstable?
- What is causing the A. Fib?
- If tachycardic is there another reason that should be treated prior to rate control?
- How long has it been going on? < 48 hours, <12 hours
- What is their risk of stroke?
- Should they be cardioverted? Anticoagulate 3 weeks before and then also anticoagulated for 4 weeks!
- What is their risk of bleeding?
- Appropriate follow up with cardiology for cardioversion/ablation, monitoring