ATRIAL FIBRILLATION

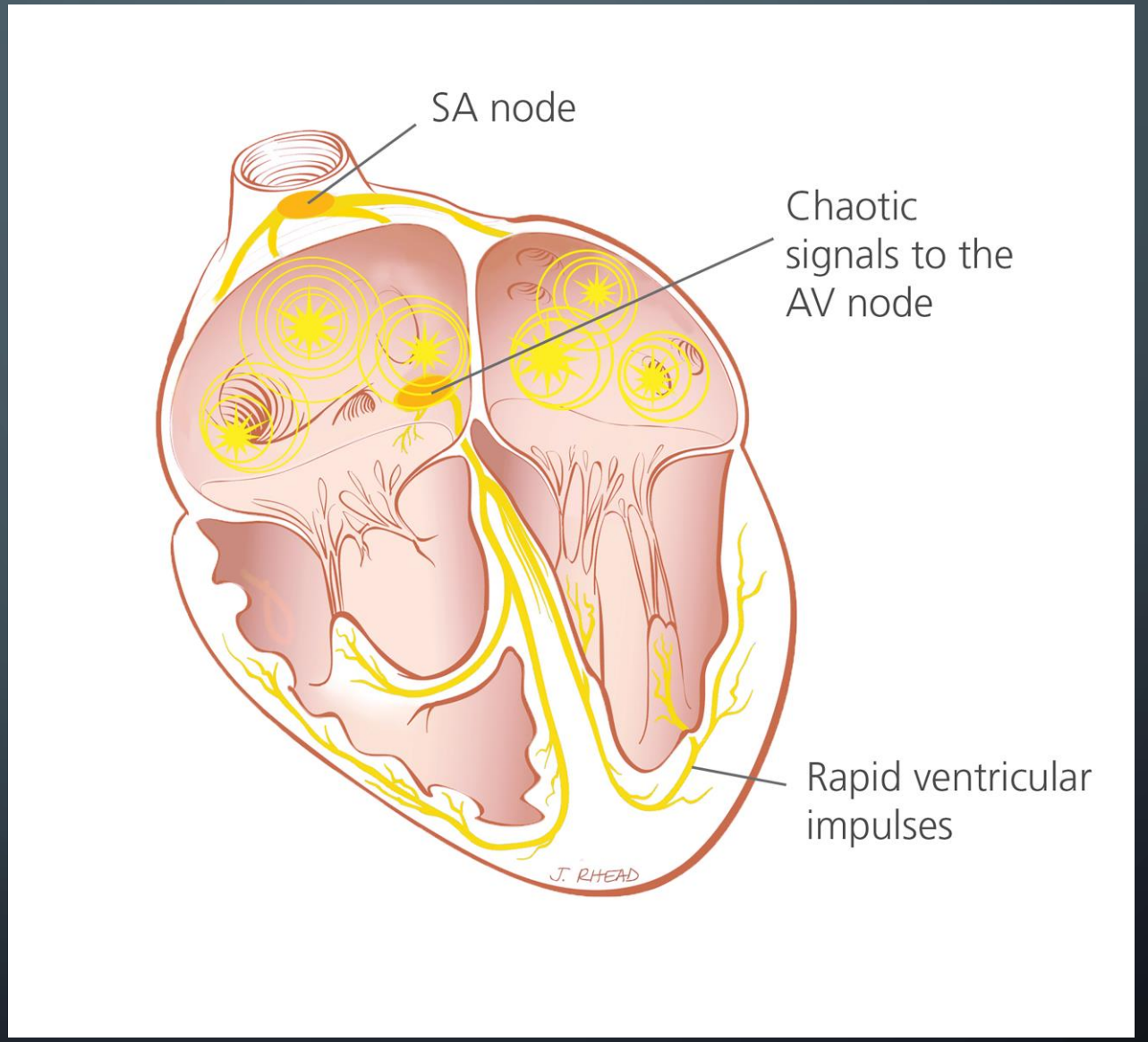
BYRON REICHERT, MD PGY 4

CARDIOLOGY FELLOW OF THE YEAR 2019-2021

OBJECTIVES

- Make atrial fibrillation great again (using guidelines)
- Understand Afib basics
- Treatment:
  - Rhythm vs. Rate:
    - Describe the patient who benefits from rhythm control as opposed to just rate control.
    - Describe the benefits of lenient rate control (up to 110 bpm at rest) versus strict rate control (60-80 bpm at rest).
    - Describe the appropriate anticoagulation recommendations before and after electrical cardioversion to NSR.
  - Rapid Ventricular Response:
    - Describe the appropriate management of a hemodynamically stable patient with atrial fibrillation and rapid ventricular response with a normal EF and with a low EF.
    - Describe the appropriate management of a hemodynamically unstable patient with atrial fibrillation and a rapid ventricular response.

ANATOMY


SA node
Chaotic signals to the AV node
Rapid ventricular impulses
J. RHEAD

BASICS

No clear discernable P waves

- There is atrial activity - Chaotic and disorganized
- Fibrillatory waves can be mistaken as flutter waves (coarse Afib)
- Flutter waves look identical/organized (also ~300 beats/min)
- Atrial rate ranging from 400 to 700 beats/min
- Ventricular response is irregular

AFIB

- Normal atrial myocardium has the following properties:
  - A short action-potential duration.
  - Cellular reactivation can occur rapidly due to the short refractory period (in contrast to Purkinje fibers and ventricular muscle).
  - Very rapid electrical conduction can occur.
  - The refractory period shortens with increasing rate.
- In the aggregate, these electrophysiologic properties permit the development of very complex patterns of conduction and an extremely rapid atrial rate as seen in AF.
- Select associated conditions (>65 yo):
  - Hypertension (80 percent)
  - CAD (60 percent)
  - Hyperlipidemia (62 percent)
  - HF (50 percent)
  - Anemia (42 percent)
  - Diabetes (36 percent)
  - Age

AFIB

- Narrow complex tachycardia – Differential diagnosis
  - ***Irregular Narrow Complex Tachycardia = 1) A-fib, 2) A-flutter with variable conduction, or 3) MAT**
- Triggers:
  - AF is initiated (triggered) predominantly by rapid firing from the pulmonary veins.
  - Atrial tachycardia, atrial flutter, and other supraventricular tachycardias can initiate AF in predisposed patients.
  - Hypertension, valvular heart disease, congestive heart failure, coronary artery disease, physiologic stress, PE, COPD, infection, OSA, cardiac surgery
- In patients with persistent AF, the prevailing understanding of the mechanism is that, once triggered, the arrhythmia is maintained (sustained) by one or more abnormalities in the atrial tissue.
  - Atrial remodeling
  - Electrical remodeling
  - Autonomic nervous system
  - Fibrosis
  - Inflammation and oxidative stress
  - Reentrant mechanism

AFIB

- A ventricular rate below 60 beats per minute, in the absence of AV nodal blocking agents, suggests AV nodal disease that may be associated with the sinus node dysfunction.
- A ventricular rate above 170 beats per minute suggests thyrotoxicosis, catecholamine excess, parasympathetic withdrawal, or the existence of an accessory bypass tract in the preexcitation syndrome.
- Loss of atrial contraction may markedly decrease cardiac output, particularly when diastolic ventricular filling is impaired by mitral stenosis, hypertension, hypertrophic cardiomyopathy (HCM), or restrictive cardiomyopathy.

AFIB

- Over the last decade, a preponderance of evidence suggests a large genetic contribution to atrial fibrillation. Having a family member with AF is associated with a 40 percent increased risk for the arrhythmia.
- Clinical Evaluation
  - EKG (tele, Holter, event monitor, loop recorders, PPM/ICD)
  - Characterize (paroxysmal, persistent, long-standing persistent, or permanent)
  - Determine cause and associated conditions
  - CXR (determine enlarged heart chambers, pulm Dz, or HF)
  - All patients should have TTE as a baseline
  - Lytes, thyroid, renal, hepatic function, blood counts
  - Consider TEE if goal is cardioversion
  - Consider BNP
  - Consider sleep study

DEFINITIONS

- Paroxysmal AF
  - AF that terminates spontaneously or with intervention within 7 d of onset.
  - Episodes may recur with variable frequency.
- Persistent AF Continuous AF that is sustained >7 d.
- Long-standing persistent AF Continuous AF >12 mo in duration.
- Permanent AF - Used when the patient and clinician make a joint **decision** to stop further attempts to restore and/or maintain sinus rhythm.
- Nonvalvular AF - AF in the absence of rheumatic mitral stenosis, a mechanical or bioprosthetic heart valve, or mitral valve repair*.

LONE AFIB – NOT IN GUIDELINES

- Controversial term
- Don't use it but know what it means
- Younger persons without:
  - Clinical or echocardiographic evidence of cardiopulmonary disease
  - Hypertension
  - DM

TRIALS

- AFFIRM Trial
  - Rate vs Rhythm
  - Nonvalvular atrial fibrillation, there is no ***survival*** benefit between rate and rhythm control. Rhythm had a tendency toward increased mortality.
  - Watch out for new information coming out showing improved morbidity with rhythm control, especially in younger patients.
- RACE II Trial
  - Strict or lenient control of atrial fibrillation rates.
  - Permanent atrial fibrillation patients, HR<110bpm is as effective as strict HR<80bpm in preventing cardiovascular events.
- ROCKET AF
  - Among patients with non-valvular Afib, rivaroxaban is noninferior to warfarin in preventing stroke and systemic thromboembolism.

BORING GUIDELINES

TABLE 6 Summary of Recommendations for Risk-Based Antithrombotic Therapy

Recommendations	COR	LOE	References
Antithrombotic therapy based on shared decision making, discussion of risks of stroke and bleeding, and patient's preferences	I	C	N/A
Selection of antithrombotic therapy based on risk of thromboembolism	I	B	(167-170)
CHA_2DS_2-VASc score recommended to assess stroke risk	I	B	(171-173)
Warfarin recommended for mechanical heart valves and target INR intensity based on type and location of prosthesis	I	B	(174-176)
With prior stroke, TIA, or CHA_2DS_2-VASc score ≥2, oral anticoagulants recommended. Options include:			
Warfarin	I	A	(171-173)
Dabigatran, rivaroxaban, or apixaban	I	B	(177-179)
With warfarin, determine INR at least weekly during initiation of therapy and monthly when stable	I	A	(180-182)
Direct thrombin or factor Xa inhibitor recommended if unable to maintain therapeutic INR	I	C	N/A
Reevaluate the need for anticoagulation at periodic intervals	I	C	N/A
Bridging therapy with UFH or LMWH recommended with a mechanical heart valve if warfarin is interrupted. Bridging therapy should balance risks of stroke and bleeding	I	C	N/A
For patients without mechanical heart valves, bridging therapy decisions should balance stroke and bleeding risks against duration of time patient will not be anticoagulated	I	C	N/A
Evaluate renal function before initiation of direct thrombin or factor Xa inhibitors, and reevaluate when clinically indicated and at least annually	I	B	(183-185)
For atrial flutter, antithrombotic therapy is recommended as for AF	I	C	N/A
With nonvalvular AF and CHA_2DS_2-VASc score of 0, it is reasonable to omit antithrombotic therapy	IIa	B	(183,184)
With CHA_2DS_2-VASc score ≥2 and end-stage CKD (CrCl <15 mL/min) or on hemodialysis, it is reasonable to prescribe warfarin for oral anticoagulation	IIa	B	(185)
With nonvalvular AF and a CHA_2DS_2-VASc score of 1, no antithrombotic therapy or treatment with oral anticoagulant or aspirin may be considered	IIb	C	N/A
With moderate-to-severe CKD and CHA_2DS_2-VASc scores ≥2, reduced doses of direct thrombin or factor Xa inhibitors may be considered	IIb	C	N/A
For PCI,* BMS may be considered to minimize duration of DAPT	IIb	C	N/A
After coronary revascularization in patients with CHA_2DS_2-VASc score ≥2, it may be reasonable to use clopidogrel concurrently with oral anticoagulants but without aspirin	IIb	B	(186)
Direct thrombin dabigatran and factor Xa inhibitor rivaroxaban are not recommended in patients with AF and end-stage CKD or on dialysis because of a lack of evidence from clinical trials regarding the balance of risks and benefits	III: No Benefit	C	(177-179,187-189)
Direct thrombin inhibitor dabigatran should not be used with a mechanical heart valve	III: Harm	B	(190)

BORING GUIDELINES

TABLE 9 Summary of Recommendations for Rate Control

Recommendations	COR	LOE	References
Control ventricular rate using a beta blocker or nondihydropyridine calcium channel antagonist for paroxysmal, persistent, or permanent AF	I	B	(267-269)
IV beta blocker or nondihydropyridine calcium channel blocker is recommended to slow ventricular heart rate in the acute setting in patients without pre-excitation. In hemodynamically unstable patients, electrical cardioversion is indicated	I	B	(270-273)
For AF, assess heart rate control during exertion, adjusting pharmacological treatment as necessary	I	C	N/A
A heart rate control (resting heart rate <80 bpm) strategy is reasonable for symptomatic management of AF	IIa	B	(269,274)
IV amiodarone can be useful for rate control in critically ill patients without pre-excitation	IIa	B	(275-277)
AV nodal ablation with permanent ventricular pacing is reasonable when pharmacological therapy is inadequate and rhythm control is not achievable	IIa	B	(278-280)
A lenient rate-control strategy (resting heart rate <110 bpm) may be reasonable when patients remain asymptomatic and LV systolic function is preserved	IIb	B	(274)
Oral amiodarone may be useful for ventricular rate control when other measures are unsuccessful or contraindicated	IIb	C	N/A
AV nodal ablation should not be performed without prior attempts to achieve rate control with medications	III: Harm	C	N/A
Nondihydropyridine calcium channel antagonists should not be used in decompensated HF	III: Harm	C	N/A
With pre-excitation and AF, digoxin, nondihydropyridine calcium channel antagonists, or amiodarone should not be administered	III: Harm	B	(281)
Dronedarone should not be used to control ventricular rate with permanent AF	III: Harm	B	(282,283)

BORING GUIDELINES

TABLE 11 Summary of Recommendations for Electrical and Pharmacological Cardioversion of AF and Atrial Flutter

Recommendations	COR	LOE	References
Prevention of thromboembolism			
With AF or atrial flutter for ≥48 h, or unknown duration, anticoagulate with warfarin for at least 3 wk before and 4 wk after cardioversion	I		(320-323)
With AF or atrial flutter for >48 h or unknown duration, requiring immediate cardioversion, anticoagulate as soon as possible and continue for at least 4 wk	I	C	N/A
With AF or atrial flutter <48 h and high stroke risk, IV heparin or LMWH, or factor Xa or direct thrombin inhibitor, is recommended before or immediately after cardioversion, followed by long-term anticoagulation	I	C	N/A
Following cardioversion of AF, long-term anticoagulation should be based on thromboembolic risk	I	C	N/A
With AF or atrial flutter for ≥48 h or unknown duration and no anticoagulation for preceding 3 wk, it is reasonable to perform TEE before cardioversion and then cardiovert if no LA thrombus is identified, provided anticoagulation is achieved before TEE and maintained after cardioversion for at least 4 wk	IIa	B	(164)
With AF or atrial flutter ≥48 h or unknown duration, anticoagulation with dabigatran, rivaroxaban, or apixaban is reasonable for ≥3 wk before and 4 wk after cardioversion	IIa	C	(230,324,325)
With AF or atrial flutter <48 h and low thromboembolic risk, IV heparin, LMWH, a new oral anticoagulant, or no antithrombotic may be considered for cardioversion	IIb	C	(326)
Direct-current cardioversion			
Cardioversion is recommended for AF or atrial flutter to restore sinus rhythm. If unsuccessful, cardioversion attempts may be repeated.	I	B	(327)
Cardioversion is recommended for AF or atrial flutter with RVR, that does not respond to pharmacological therapies	I	C	N/A
Cardioversion is recommended for AF or atrial flutter and pre-excitation with hemodynamic instability	I	C	N/A
It is reasonable to repeat cardioversion in persistent AF when sinus rhythm can be maintained for a clinically meaningful time period between procedures	IIa	C	N/A
Pharmacological cardioversion			
Flecainide, dofetilide, propafenone, and IV ibutilide are useful for cardioversion of AF or atrial flutter, provided contraindications to the selected drug are absent	I	A	(328-333)
Amiodarone is reasonable for pharmacological cardioversion of AF	IIa	A	(334,335)
Propafenone or flecainide ("pill-in-the-pocket") to terminate AF out of hospital is reasonable once observed to be safe in a monitored setting	IIa	B	(328)
Dofetilide should not be initiated out of hospital	III: Harm	B	(332,336)

BORING GUIDELINES

- Special populations
  - HOCM
  - ACS – Urgent cardioversion of new-onset AF in the setting of ACS is recommended for patients with hemodynamic compromise, ongoing ischemia, or inadequate rate control.
  - Hyperthyroid
  - Pulm diseases – A nondihydropyridine calcium channel antagonist is recommended to control ventricular rate with AF and COPD
  - WPW
  - CHF – Avoid IV nondihydropyridine calcium channel antagonists, IV beta blockers, and dronedarone should not be given with decompensated HF. Digoxin is effective to control resting heart rate with HFrEF.
  - Post-op – BB before CaChB

BORING GUIDELINES – 2019 UPDATE

- NOACs are recommended over warfarin except in patients with moderate to severe mitral stenosis or a prosthetic heart valve (COR I, LOE A).
- The decision to use an anticoagulant should not be influenced by whether the AF is paroxysmal or persistent (COR I, LOE B).
- Renal and hepatic function should be tested before initiation of a NOAC and at least annually thereafter (COR I, LOE B-NR).
- In AF patients with a CHA_2DS_2-VASc score ≥ 2 in men or ≥ 3 in women and a creatinine clearance <15 ml/min or who are on dialysis, it is reasonable to use warfarin or apixaban for oral anticoagulation (COR IIb, LOE B-NR).
- Idarucizumab is recommended for the reversal of dabigatran in the event of a life-threatening bleed or urgent procedure (COR I, LOE B-NR).
- Andexanet alfa (recombinant factor Xa) can be useful for the reversal of rivaroxaban and apixaban in the event of life-threatening bleeding (COR IIa, LOE B-NR).
- Percutaneous left atrial appendage occlusion may be considered for at-risk AF patients with AF at increased risk of stroke who have contraindications to long-term anticoagulation (COR IIb, LOE B-NR).
- AF catheter ablation may be reasonable in symptomatic patients with heart failure and a reduced ejection fraction to reduce mortality and heart failure hospitalizations (COR IIb, B-R).
- In at-risk AF patients who have undergone coronary artery stenting, double therapy with clopidogrel and low-dose rivaroxaban (15 mg daily) or dabigatran (150 twice daily) is reasonable to reduce the risk of bleeding as compared to triple therapy (COR IIa, B-R).
- Weight loss combined with risk factor modification is recommended for overweight and obese patients with AF (COR I, LOE B-R).
- In patients with cryptogenic stroke in whom **external ambulatory monitoring is inconclusive**, implantation of a cardiac monitor is reasonable for detection of subclinical AF (COR IIa, B-R).

MANAGEMENT TIME!

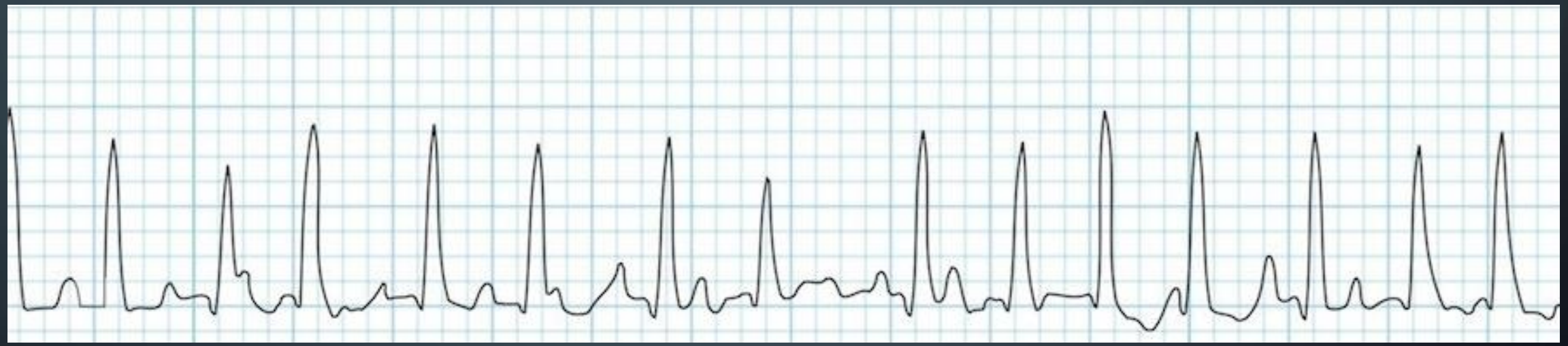
MANAGEMENT!

- Is this really atrial fibrillation?
- Stable or unstable
- Fast or Slow
- Ongoing Ischemia
- Acute or Chronic
- Heart failure or not

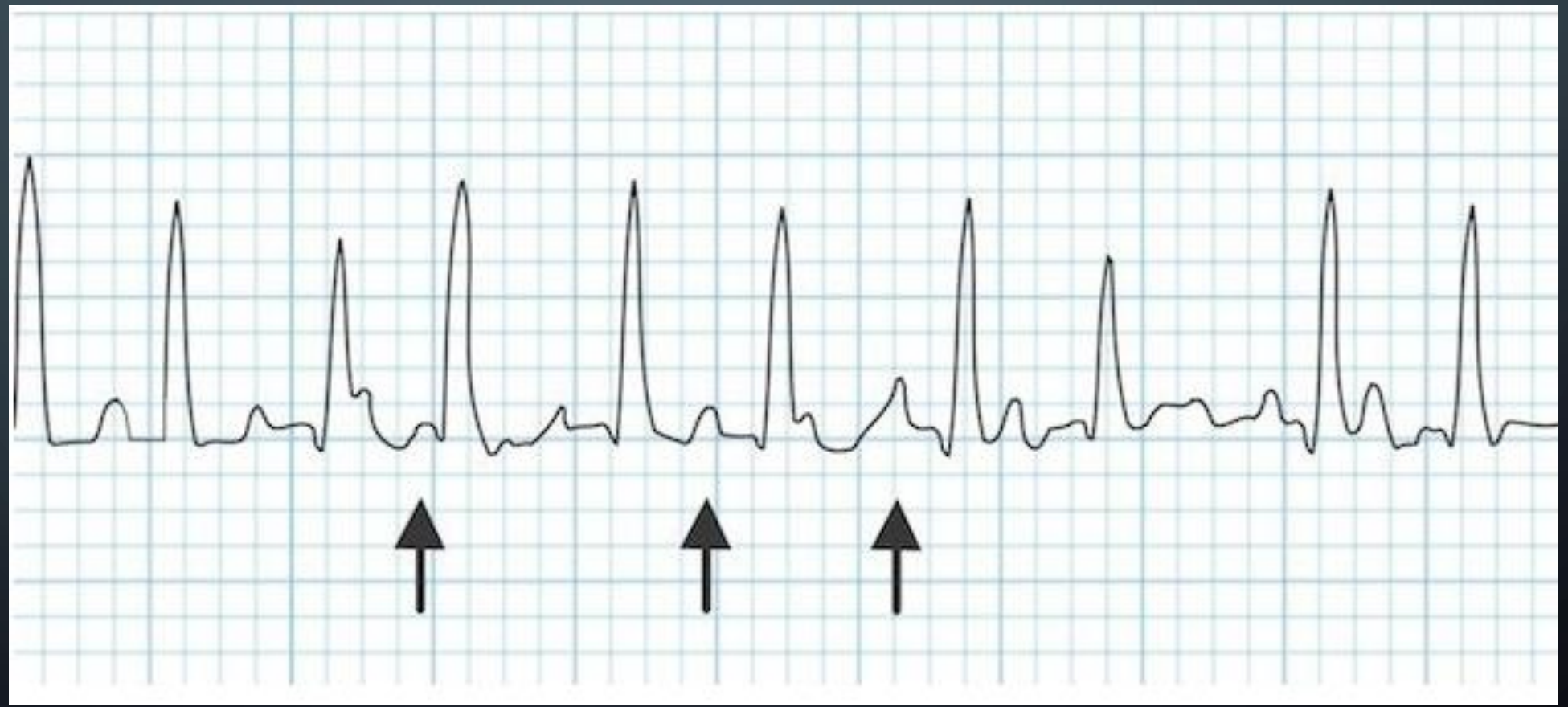
CASE I – CROSS COVER DELIGHT

- Close your eyes and picture the VA call room
- PAGE FROM 4C – PATIENT WITH FAST HEART RATE, TELE SAYS AFIB.
- CROSS COVER SIGN OUT
  - 66 YEAR OLD WITH COPD EXACERBATION …… NTD
  - You decide this warrants a bedside eval.
  - Let's check out the tele strip.

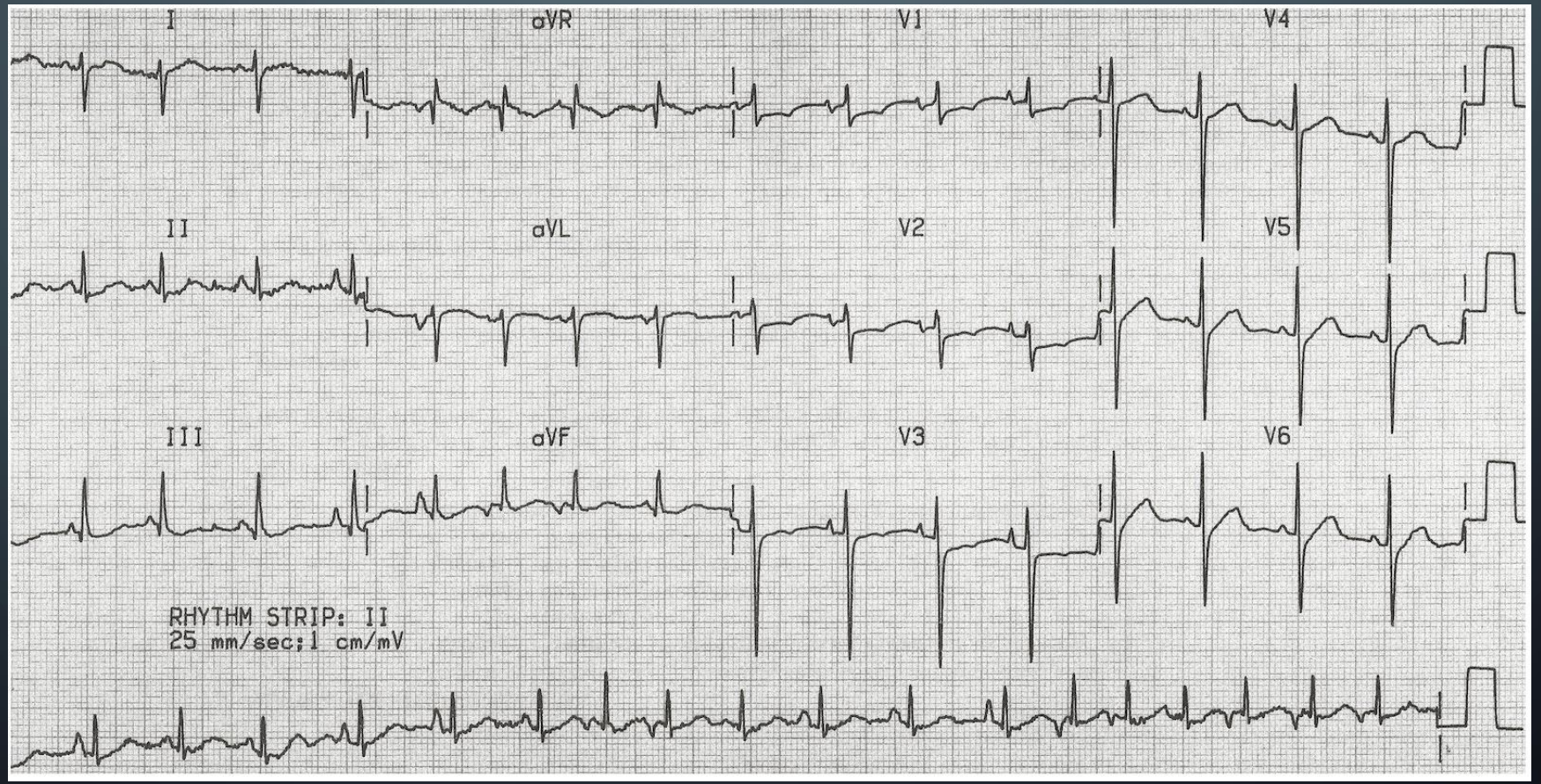
TELE STRIP



TELE STRIP



12 LEAD EKG


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
RHYTHM STRIP: II
25 mm/sec;1 cm/mV

MULTIFOCAL ATRIAL TACHYCARDIA

- Rapid irregular atrial rhythm arising from multiple ectopic foci within the atria
- Most commonly seen in severe COPD
- Heart rate >100 BMP
- Varying PP, PR, and RR intervals
- At least 3 distinct P wave morphologies in the same lead
- Isoelectric baseline between P waves
- Treatment: Treat underlying disease process/Consult Pulm ****STAT****

CASE 2

- 62 year old gentleman who develops acute onset of chest pain.
- Classic story. He read the same AHD article the night before. It sounds legit.
- EKG – NO STEMI
- Chest pain order set done!
- Troponin is cooking in the lab.
- Clicked on the heparin gtt 3x. Cancelled the order 2x so far and now they just say pending.
- Clicked on labs/refreshed about 5x so far.

HMM, LOOK BACK AT THE EKG

- It's atrial fibrillation with RVR.
- He's going fast because of his chest pain. I would be too.
- Troponin is back --- 4
- Repeat bedside eval
  - Mostly moans and groans
  - Blood pressure is 75/40
  - Called respiratory therapy to get STAT EKG

UNSTABLE ATRIAL FIBRILLATION

- Emergent Cardioversion
- Place the electrode pads
  - Preferable along left anteroposterior fashion.
    - Better for atrial arrhythmias, small interelectrode distance and less interposition of lung parenchyma.
    - Though has not been verified in a randomized trial and studies differ.
  - Synchronized to the QRS complex
  - Defibrillation – random delivery of shock during the cardiac cycle

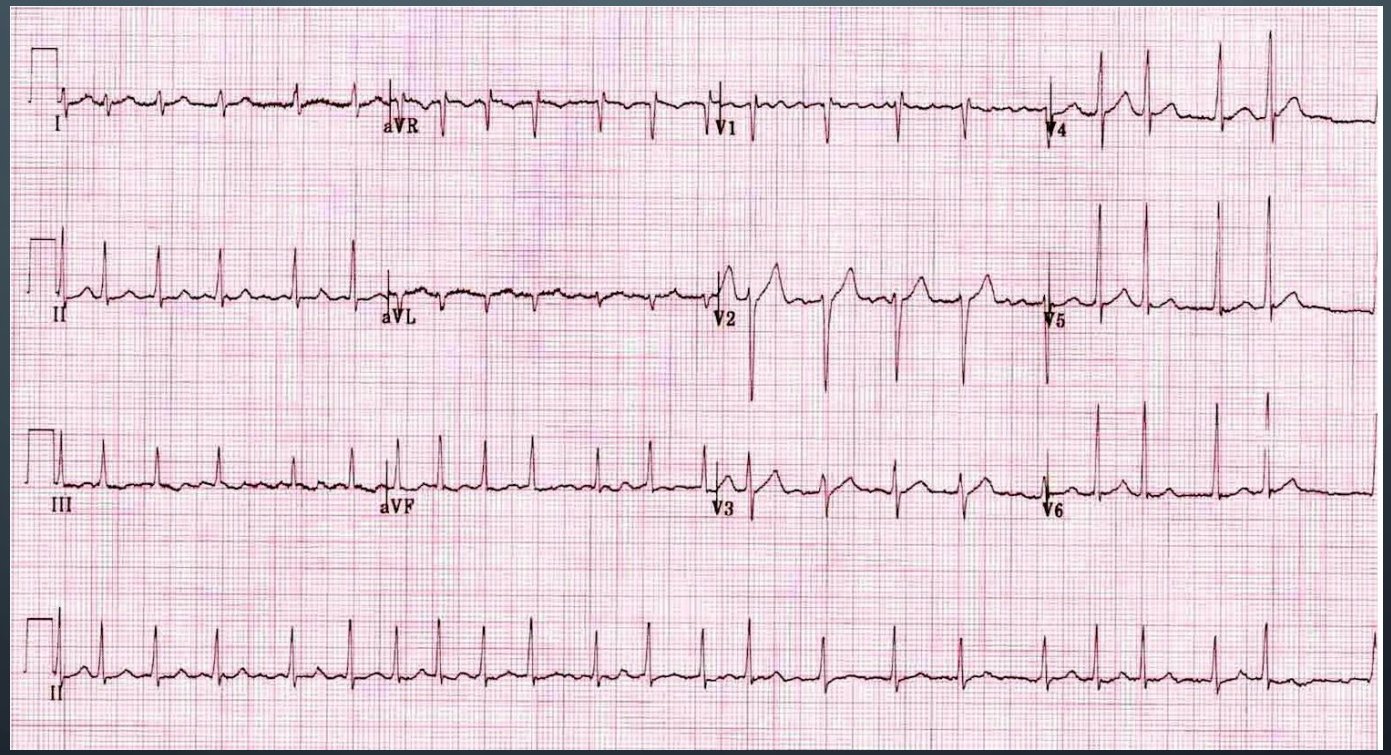
SHOCK

1. Place pads
2. Oxygen/airway/RT
3. Energy selection 120-200J (biphasic) (Best-AF trial)
4. Synchronization
    - This is to prevent the R on T phenomenon.
5. Clear/Shock

CASE 3 – 2:30 AM NEW ONSET AFIB

- PAGED BY 3B – Patient needs to be made a full admit and a renew Foley order….. Oh, and also has new onset atrial fibrillation
- Vitals are stable 3 hours ago.

12 LEAD ECG



TREATMENT OPTIONS

- Blood pressure 120/80, Normal mentation
- Physical exams show no signs of heart failure
- Medications
  - IV 5mg Metoprolol x 3, q 5 minutes

IV METOPROLOL DOESN'T WORK

- What now?!
- Diltiazem gtt
  - Call pharmacy?
  - Start off with a 10mg Diltiazem bolus (remember, stable BP) followed by running gtt at anywhere from 5 to 15mg/hr.
  - Rates are better controlled.
  - 4:00 AM success story.

DILTIAZEM GTT

- Hmm, patient is on diltiazem gtt at 15mg/hr. Rate controlled. All is good.
- Last time I turned off the a dilt gtt, patient went into afib with rvr.
- Leave it on until rounds.
- Standard Rates of Conversion
  - 5mg/hr – 180mg/day
  - 10mg/hr - 330mg/day
  - 15mg/hr – 480mg/day
- Divide by 4 to get the short acting dose.
- Give first dose about an hour prior to stopping the gtt.
- If this works, then you can convert to long acting diltiazem.
- Calcium channel blockers (except amlodipine) should generally be avoided in patients with heart failure with reduced ejection fraction (HFrEF) since they provide no functional or mortality benefit and some first generation agents may worsen outcomes. Will your patient immediately code if given dilt if the have a history of CHF? Probably not, but in general we avoid non-dihydropyridine CaChB in HFrEF.

CURRENTLY RATE CONTROLLED BUT STILL IN AFIB

- Patient is highly symptomatic at a heart rate of 67 BMP
- What do you do?
  1. Go up on the PO dilt dose until heart rate is 60BPM
  2. Dismiss it, rate control is all you get
  3. Consult cardiology
  4. Slap the pads on him and lets get him in sinus rhythm
- This is good scenario where rate control is not enough. He clearly is symptomatic in mere presence of atrial fibrillation (A-V dyssynchrony). Rhythm control will be ideal for this patient.
- Good case for cardioversion, anti-arrhythmics, or even to go visit Dr. Su.

DECIDE FOR CARIOVERSION

- < 48 hours – Elective DCCV and decide on AC if high risk.
- > 48 hours, TEE with 4 weeks of anticoagulation afterwards.
- Unknown, TEE with 4 weeks of anticoagulation after.
- Unknown, 3 weeks of anticoagulation prior to cardioversion.

CASE 4 – MICU RESIDENT

- 2:30 AM – New admission arrives
  - 62 year old veteran from the AZ Veterans home.
  - Previous CVA, no history obtained, no family to call.
  - But 10,000 notes in CPRS to review.
  - Admitted to ICU for sepsis and hypotension.

CLUES

- WBC 25k, Lactic acid 7, BNP 1,000
- Echo from 2001 shows an EF of 20%
- Vitals
  - 105/76, RR 18, Pulse 138

TREATMENT OPTIONS

- Remember that tachycardia has its role in sepsis
- Low EF/marginal blood pressure
  - IV Metoprolol
  - IV Diltiazem
  - IV Sotalol
  - IV amiodarone
  - Cardioversion

AMIODARONE

- The gift from the Gods.
- Dose
  - 150mg over 10 minutes; 1mg/min for 6 hours, and then 0.5mg/min for 18 hours.
  - Who knows the total loading dose of amio?
  - Bonus* When do you give 300mg rapid bolus?
    - Pulseless VT/VF

FEAR OF AMIODARONE

- I'm afraid to use Amio.
- I don't want to cause a stroke. What if he/she converts on me?
- The stroke risk is 1.9% for a CHADS2 0 and 18.2% for CHADS2 of 6.
- Should I just start a heparin gtt while I give amio?
- What about that lumbar puncture I still need to do?

CONVERTING AND THROWING LEFT ATRIAL THROMBUS IN THE APPENDAGE

- Sepsis – Afib with RVR
  - May not be the ideal time for anticoagulation.
  - Guidelines state you should start AC as soon as possible but keep in mind any reason that the pt should not be on AC during their stay (need surgery?, LP?, central line?)

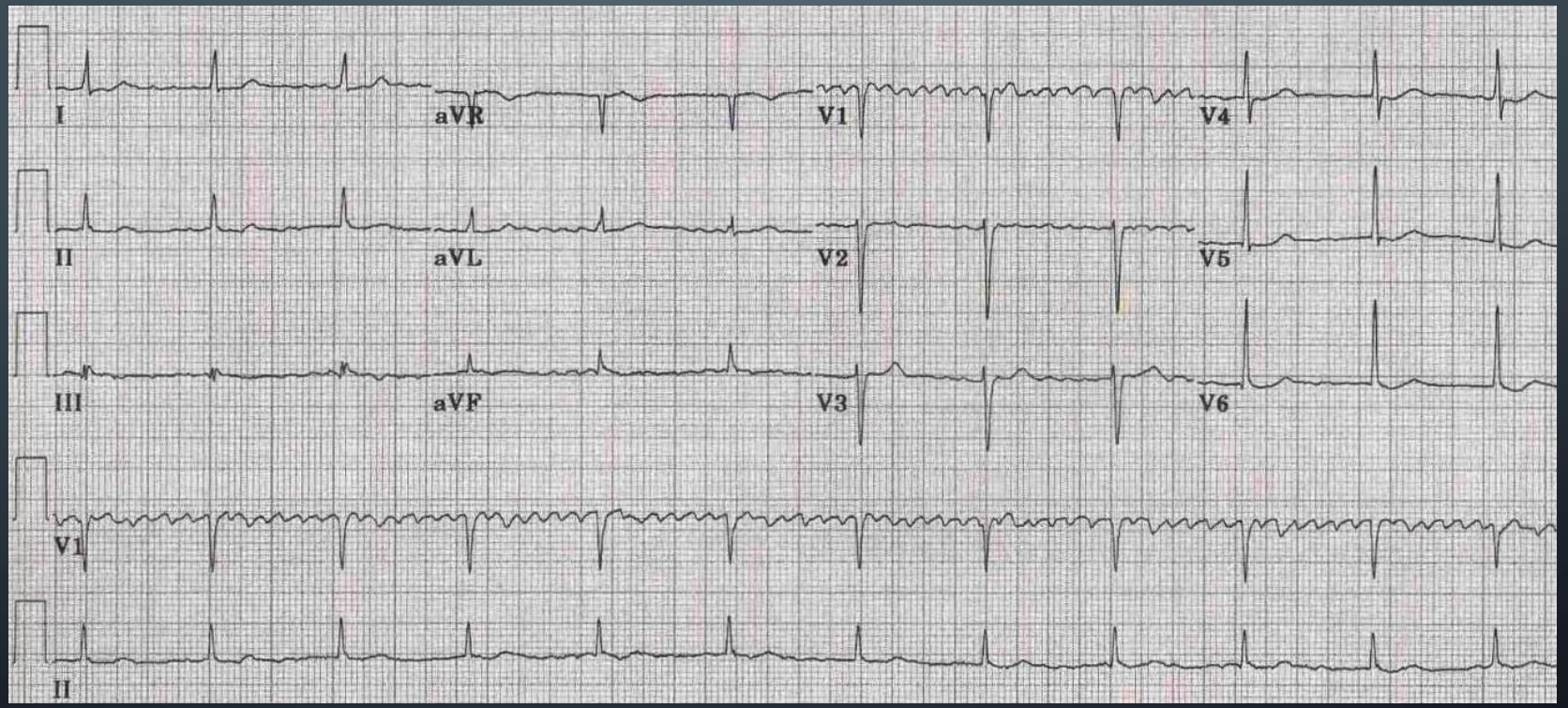
CRITICAL CARE/AFIB

- Esmolol
  - Beta block
  - Greater short half life, negative inotropic effect
- Diltiazem
  - Longer half life in as esmolol
  - Negative inotropic effects
  - Stay away in the ICU setting
- Amiodarone
  - Safe in heart failure
- Digoxin
  - Positive inotropic effect
  - Reduce dose in renal dysfunction

CASE 5 – HISTORY OF AFIB

- 84 year old male admitted for nausea, vomiting, and possible syncope.
  - History of heart failure, EF of 30%
  - Doesn't remember his meds but has been on same ones "forever."

12 LEAD



RHYTHM ANALYSIS

- ATRIA – CHAOTIC ATRIAL FIBRILLATION >300
- VENTRICLE – REGULAR RATE
- HOW DOES ATRIAL FIBRILLATION GIVE YOU A REGULAR VENTRICULAR RATE?
- IT'S OKAY, THE PATIENT IS RATE CONTROLLED. MY WORK IS DONE.

DIGOXIN TOXICITY

- This is complete heart block.
- We have a regularized ventricular rate in the setting of atrial fibrillation.
- Always be suspicious of some form of block when encountering a slow atrial fibrillation.

TREATMENT OF DIGOXIN TOXICITY

- Any clinically significant arrhythmia from digitalis, can produce hypotension and will need digoxin specific antibody fragments.
- Contact poison control and the local adults.
- Symptomatic bradycardia can be treated with atropine until digi-bind is available.
- Any ventricular arrhythmia can be treated with standard ACLS.

CASE 6

- 48 year old gentleman with a history of atrial fibrillation.
- Admitted for Afib w/RVR
- Medicine team started the patient on Dilt gtt. ECHO shows normal EF.
- Day 1 – on Dilt gtt 15mg/hr, not rate controlled yet
- Day 2 – Discontinue Dilt and started on Amiodarone
- Day 3 – Rates still not controlled. Consult Cardiology
- Day 4 – Cardiology evaluates patient, nl EF. Decide to start Dofetilide

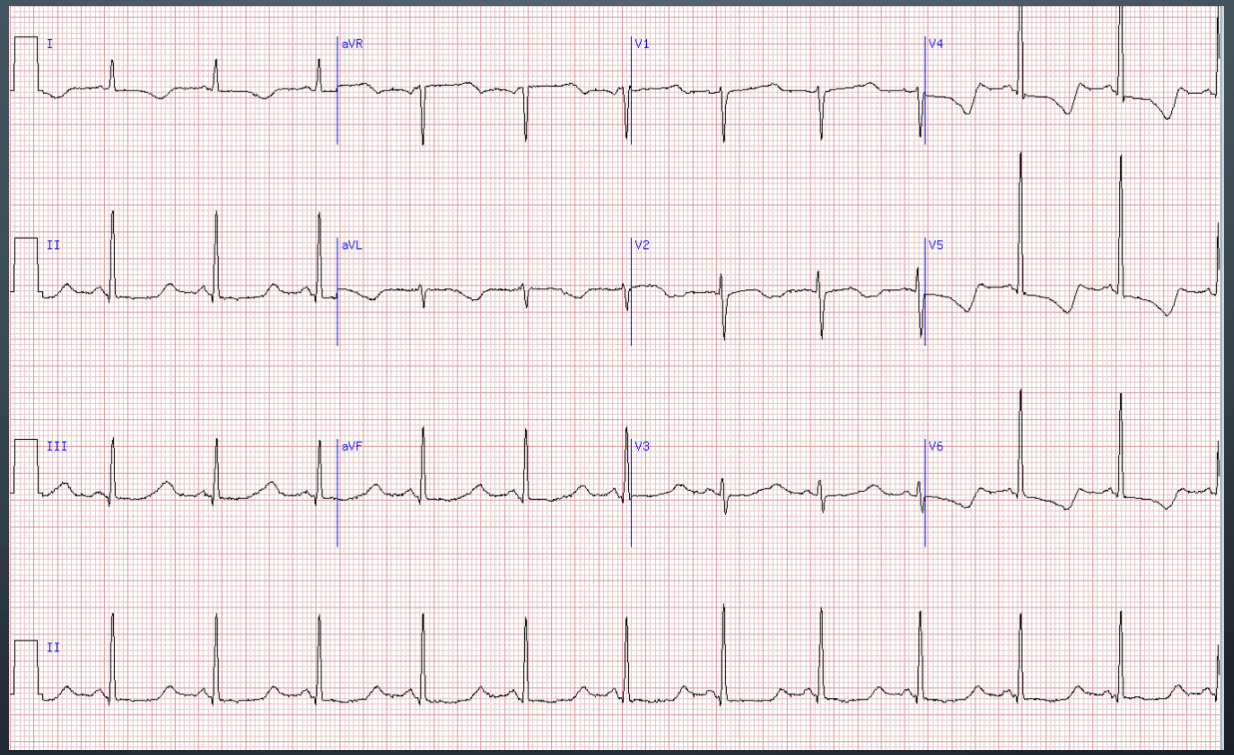
DOFETILIDE/TIKOSYN

- Doses: 125, 250, 500 micrograms.
- Uses: maintenance of sinus rhythm in individuals prone to the occurrence of atrial fibrillation and flutter and for chemical cardioversion
- Class III antiarrhythmic agent
  - Selectively blocking the rapid component of the delayed rectifier outward potassium current.
  - Increases the refractory period of this.
  - Steady state in 2-3 days.
  - Excreted by the kidneys, must correct for renal insufficiency.
  - Can't give to patients with diuretics.

A FEW FUN FACT OF POPULAR AFIB DRUGS

- Flecanide, Propafenone, and Sotalol – used for maintenance of sinus rhythm.
  - NO LVH, CAD, or Heart Failure
  - If your patient is on this drug, he/she shouldn't have the above conditions
- Heart Failure
  - Amiodarone
  - Dofetilide
- Patient has coronary artery disease
  - Options are Dofetilide, Sotalol, Amiodarone

SINUS!!



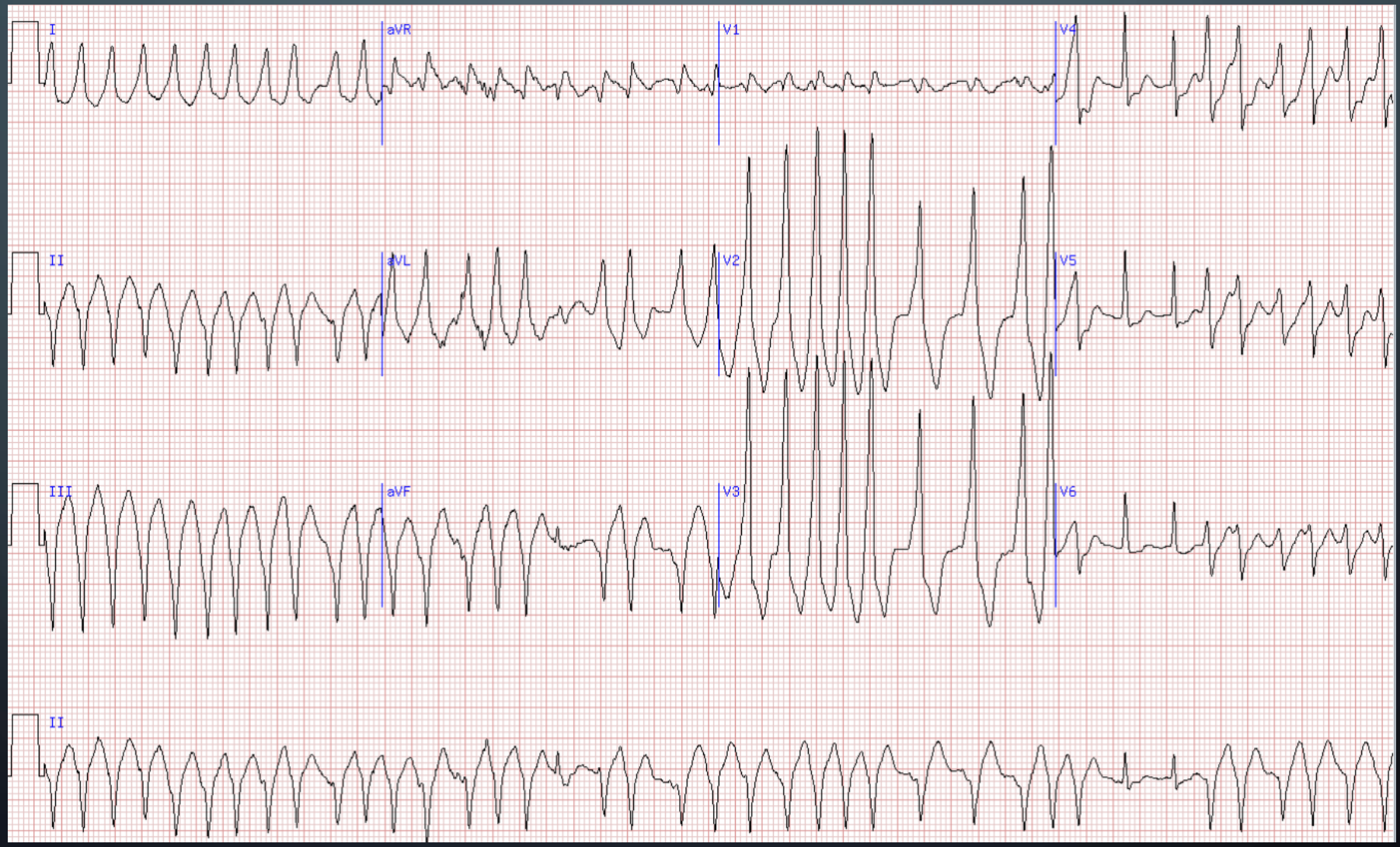
DISCHARGE HOME WITH A RX OF DOFETILIDE?

- Thank the cardiology fellow.

CASE 7

- 49 year old lady with a history of “palpitations” that is now short of breath at a rapid response.

12 LEAD ECG



WPW AND AFIB

- Can occur in up to 20% of patients with WPW.
- Irregularly irregular tachycardia.
- The accessory pathway allows for rapid conduction directly to the ventricles bypassing the AV node.
- Rapid ventricular rates may result in degeneration to VT or VF.
- Complexes vary in shape and width
- May approach 250-300 bpm or higher (hint that its going too fast for the AVN, therefore not a Afib with LBBB)
- Avoid all AV nodal blockers…including Amiodarone!
  - Use Procainamide, Flecainide(?), or electrical cardioversion

JAMA | Original Investigation

Effect of a Home-Based Wearable Continuous ECG Monitoring Patch on Detection of Undiagnosed Atrial Fibrillation
The mSToPS Randomized Clinical Trial

Steven R. Steinhubl, MD; Jill Waalen, MD, MPH; Alison M. Edwards, MStat; Lauren M. Ariniello, BS; Rajesh R. Mehta, RPh, MS; Gail S. Ebner, BS; Chureen Carter, PharmD, MS; Katie Baca-Motes, MBA; Elise Felicione, MPH, MBA; Troy Sarich, PhD; Eric J. Topol, MD

IMPORTANCE Opportunistic screening for atrial fibrillation (AF) is recommended, and improved methods of early identification could allow for the initiation of appropriate therapies to prevent the adverse health outcomes associated with AF.

OBJECTIVE To determine the effect of a self-applied wearable electrocardiogram (ECG) patch in detecting AF and the clinical consequences associated with such a detection strategy.

DESIGN, SETTING, AND PARTICIPANTS A direct-to-participant randomized clinical trial and prospective matched observational cohort study were conducted among members of a large national health plan. Recruitment began November 17, 2015, and was completed on October 4, 2016, and 1-year claims-based follow-up concluded in January 2018. For the clinical trial, 2659 individuals were randomized to active home-based monitoring to start immediately or delayed by 4 months. For the observational study, 2 deidentified age-, sex- and CHA_2DS_2-VASc–matched controls were selected for each actively monitored individual.

INTERVENTIONS The actively monitored cohort wore a self-applied continuous ECG monitoring patch at home during routine activities for up to 4 weeks, initiated either immediately after enrolling (n = 1364) or delayed for 4 months after enrollment (n = 1291).

MAIN OUTCOMES AND MEASURES The primary end point was the incidence of a new diagnosis of AF at 4 months among those randomized to immediate monitoring vs delayed monitoring. A secondary end point was new AF diagnosis at 1 year in the combined actively monitored groups vs matched observational controls. Other outcomes included new prescriptions for anticoagulants and health care utilization (outpatient cardiology visits, primary care visits, or AF-related emergency department visits and hospitalizations) at 1 year.

RESULTS The randomized groups included 2659 participants (mean [SD] age, 72.4 [7.3] years; 38.6% women), of whom 1738 (65.4%) completed active monitoring. The observational study comprised 5214 (mean [SD] age, 73.7 [7.0] years; 40.5% women; median CHA_2DS_2-VASc score, 3.0), including 1738 actively monitored individuals from the randomized trial and 3476 matched controls. In the randomized study, new AF was identified by 4 months in 3.9% (53/1366) of the immediate group vs 0.9% (12/1293) in the delayed group (absolute difference, 3.0% [95% CI, 1.8%-4.1%]). At 1 year, AF was newly diagnosed in 109 monitored (6.7 per 100 person-years) and 81 unmonitored (2.6 per 100 person-years; difference, 4.1 [95% CI, 3.9-4.2]) individuals. Active monitoring was associated with increased initiation of anticoagulants (5.7 vs 3.7 per 100 person-years; difference, 2.0 [95% CI, 1.9-2.2]), outpatient cardiology visits (33.5 vs 26.0 per 100 person-years; difference, 7.5 [95% CI, 7.2-7.9), and primary care visits (83.5 vs 82.6 per 100 person-years; difference, 0.9 [95% CI, 0.4-1.5]). There was no difference in AF-related emergency department visits and hospitalizations (1.3 vs 1.4 per 100 person-years; difference, 0.1 [95% CI, −0.1 to 0]).

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Author Affiliations: Scripps Translational Science Institute, La Jolla, California (Steinhubl, Waalen, Ariniello, Ebner, Baca-Motes, Topol); Wave Research Center, La Jolla, California (Steinhubl, Ebner,

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