

## Chronic Non-Valvular Atrial Fibrillation & A Pharmacy-based Population Health Model for Detection of Atrial Fibrillation

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## Learning Objectives

- ◆ Define atrial fibrillation & pathophysiology of atrial fibrillation.
- ◆ Define ventricular response rate, permanent and paroxysmal atrial fibrillation.
- ◆ List the common signs and symptoms associated with atrial fibrillation.
- ◆ Describe the mortality and morbidity associated with atrial fibrillation.
- ◆ Describe the stroke risk for patients with atrial fibrillation.
- ◆ Know CHADS score and what is a low, moderate, and high risk patient.
- ◆ Describe treatment recommendations and key concepts for drug therapy in the treatment of atrial fibrillation.
- ◆ Discuss the role the community pharmacy, pharmacists, and pharmacy technicians may have in the disease management of atrial fibrillation

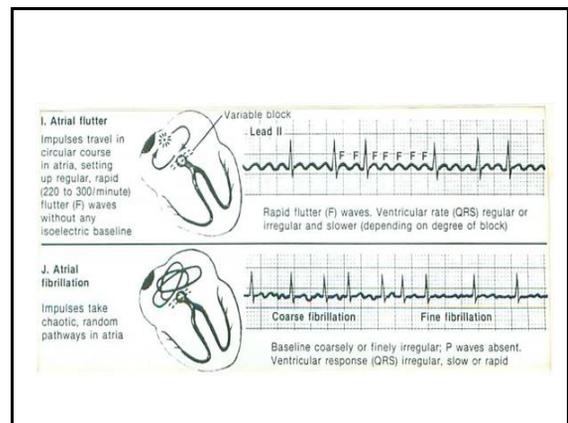
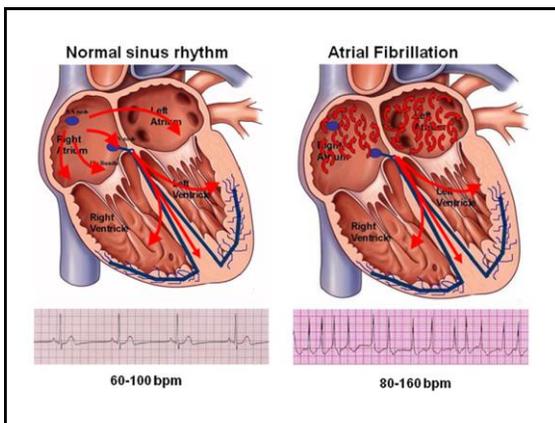
## Atrial Fibrillation

*Why Atrial Fibrillation, Pathophysiology, Signs and Symptoms*

## Introduction

Atrial fibrillation (AF) is a supraventricular (above the ventricles) tachyarrhythmia characterized by

- ◆ Uncoordinated atrial activation → deterioration of mechanical function
- ◆ A. fib characterized by chaotic atrial activity (atrial rate \*500-600 beats per minute)
- ◆ A. flutter characterized by fast regular atrial activity ( ~ 300 beats per minute)
- ◆ AV node allows some of the atrial impulses to depolarize the ventricles; ventricular (QRS) rate is irregular pattern (for a. fib) and sometimes a regular pattern (for a. flutter, e.g. 2:1 block)



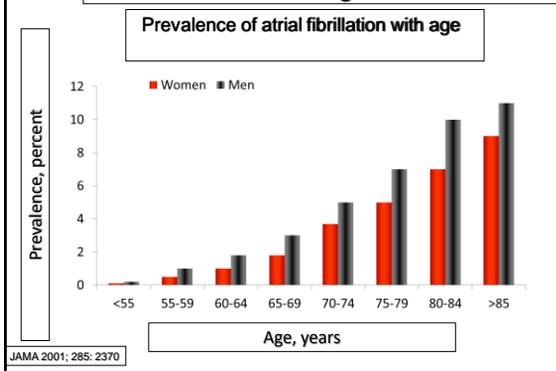
## AV Node

- ◇ The AV-node plays an important role in atrial fibrillation.
  - Slows and impedes the impulses from the atrium to the ventricular.
- ◇ Without the AV-node all the impulses from the atrium (300-600 bpm) would be conducted to the ventricles leading to ventricular rates of 300-600 bpm – this is not compatible with life (ventricular fibrillation!)
- ◇ Because the AV-node is there, not all atrial impulses are transmitted, usually only 120-150 impulses can get through per minute. Therefore, the ventricles are beating at a rate of 120-150 bpm (**VENTRICULAR RESPONSE RATE - VRR**) which most patients can tolerate, patients can generate enough cardiac output (although they may be symptomatic).
- ◇ A goal of rate control therapy in atrial fibrillation/flutter is to decrease VRR to between 80 to 110 bpm.

## Epidemiology – Why Afib is Important

- ◇ More than 200,000 cases per year.
- ◇ Incidence increased 13% over past 20 years
- ◇ In USA, 12-16 million will be affected by 2050
- ◇ Increasing obesity and increasing age are risk factors that help explain rise in incidence
- ◇ Costs \$26 billion to treat on annual basis

## AF Prevalence: Age and Gender



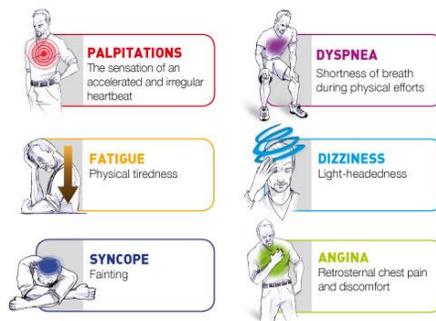
## Pathophysiology

- ◇ Atrial Structure Abnormalities
  - ◇ Atrial dilation (increase pressure – e.g. heart failure)
  - ◇ Fibrosis
  - ◇ Ischemia
- ◇ Inflammation, Oxidative Stretch
- ◇ Hyperthyroidism
- ◇ Alcohol and drug use
- ◇ Genetic Variants

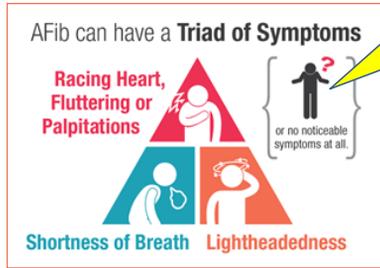
## Risk Factors

- ◇ Hypertension
- ◇ Heart Disease – especially Heart Failure
- ◇ Hyperthyroidism
- ◇ Excessive alcohol
- ◇ Obesity
- ◇ Sleep Apnea

## Symptoms



## Symptoms – Asymptomatic!



## Atrial Fibrillation / Flutter Is Associated with Increased Morbidity and Mortality

- Symptomatic or asymptomatic
- Death: 2-fold ↑ in risk
- **Thromboembolism / stroke: 5-fold ↑ in risk**
- Tachycardia-induced worsening of associated myocardial ischemia or heart failure
- Adverse atrial and ventricular remodeling due to tachycardia-induced cardiomyopathy
- Cardiovascular hospitalization: 2 to 3-fold ↑ in risk

Krahn AD, et al. Am J Med. 1995;98:476-484  
Benjamin EJ, et al. Circulation. 1998;98:946-952.

## Atrial Fibrillation

### Classification and Current Treatment



## Diagnosis

### ◆ Electrocardiogram



ECG tracing of a normal heart rhythm.



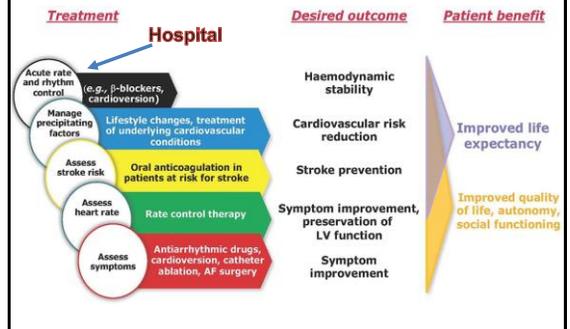
In atrial fibrillation, the tracing shows tiny, irregular "fibrillation" waves between heartbeats. The rhythm is irregular and erratic.

### Definitions of AF: A Simplified Scheme

Term	Definition
<b>Paroxysmal AF</b>	<ul style="list-style-type: none"> <li>• AF that terminates spontaneously or with intervention within 7 d of onset.</li> <li>• Episodes may recur with variable frequency.</li> </ul>
<b>Persistent AF</b>	<ul style="list-style-type: none"> <li>• Continuous AF that is sustained &gt;7 d.</li> </ul>
<b>Long-standing persistent AF</b>	<ul style="list-style-type: none"> <li>• Continuous AF &gt;12 mo in duration.</li> </ul>
<b>Permanent AF</b>	<ul style="list-style-type: none"> <li>• The term "permanent AF" is used when the patient and clinician make a joint decision to stop further attempts to restore and/or maintain sinus rhythm.</li> <li>• Acceptance of AF represents a therapeutic attitude on the part of the patient and clinician rather than an inherent pathophysiological attribute of AF.</li> <li>• Acceptance of AF may change as symptoms, efficacy of therapeutic interventions, and patient and clinician preferences evolve.</li> </ul>
<b>Nonvalvular AF</b>	<ul style="list-style-type: none"> <li>• AF in the absence of rheumatic mitral stenosis, a mechanical or bioprosthetic heart valve, or mitral valve repair.</li> </ul>

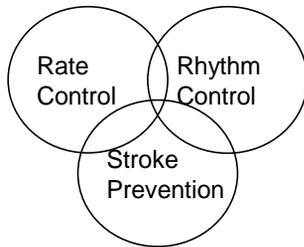
AF indicates atrial fibrillation.

## Treatment Goals



## AF Treatment Options

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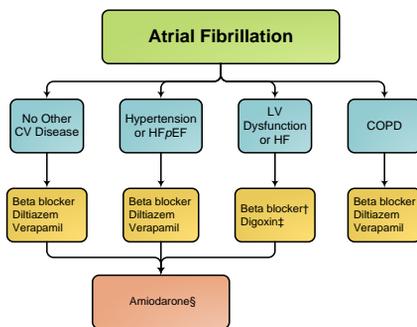


## Rate Control

- ❖ Decrease the ventricular response rate (how fast the ventricles are contracting)
- ❖ A ventricular response rate control strategy (resting heart rate <80 bpm) is reasonable for symptomatic management of AF.
- ❖ A lenient rate-control strategy (resting heart rate <110 bpm) may be reasonable as long as patients remain asymptomatic and LV systolic function is preserved.
- ❖ Use drugs that decrease AV node conduction

(Circulation. 2014;130:e199-e267)

### Approach to Selecting Drug Therapy for Ventricular Rate Control\*



(Circulation. 2014;130:e199-e267.)

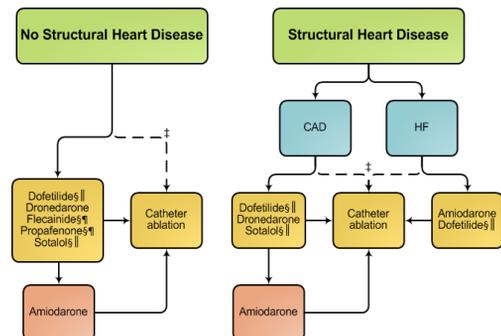
## Rate Control – General Monitoring

- ❖ Ventricular response rate – measure pulse
- ❖ Blood pressure – most rate control drugs can decrease blood pressure
- ❖ Calcium channel blockers can cause constipation and heartburn.
- ❖ Beta blockers can lead to fatigue and decrease exercise tolerance.
- ❖ Digoxin – need to monitor serum levels

## Rhythm Control

- ❖ Cardioversion to normal sinus rhythm from Afib.
  - ❖ Electrical
  - ❖ Pharmacological
  - ❖ Patient on their own converts (paroxysmal)
- ❖ Maintenance of normal sinus rhythm if needed (prevent Afib from coming back)
  - ❖ Pharmacological
  - ❖ Ablation

### Strategies for Rhythm Control in Patients with Paroxysmal\* and persistent AF†



## Rhythm Control – General Monitoring

- ◆ Afib Burden – how often do patients go back into atrial fibrillation
- ◆ Need to monitor for adverse effects and drug interactions for the antiarrhythmic agent selected.
  - ◆ For example, if patient is on warfarin and amiodarone is started need to evaluate for significant drug interaction.

## Rhythm vs Rate Control

- ◆ Rate control may be the only option in some patients in which normal sinus rhythm cannot be maintained (permanent AF) or due to adverse drug effects or risk.
- ◆ Rhythm control is preferred in patients with **symptoms despite rate control**, including those with persistent symptoms of heart failure.
- ◆ **Outcomes appear to be similar between rhythm vs rate control.**

## So.....

- ◆ So you will see the following types of patients:
  - ◆ Permanent A Fib on rate control medication
  - ◆ Paroxysmal A Fib on rate control medication
  - ◆ Paroxysmal A Fib on rhythm and rate control medication
  - ◆ Normal sinus rhythm on rhythm control medication with or without rate control medication
  - ◆ All likely on some form of antithrombotic therapy.

## Atrial Fibrillation Stroke Risk and Prevention

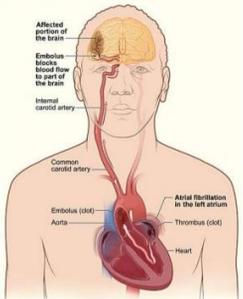




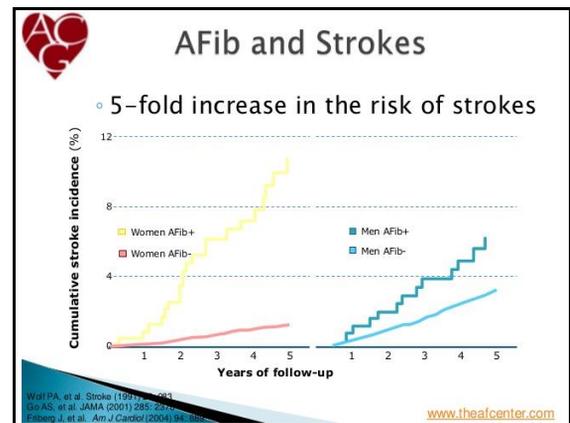
## Afib and Stroke

• Afib → Inadequate blood flow in some areas of the heart → blood clot

• Blood clots can dislodge and travel to the brain → stroke



[www.theafcenter.com](http://www.theafcenter.com)



## Scoring Systems for Stroke Risk

- A variety of systems have been published
  - CHADS2
  - CHA2DS2-VASc
- All use selected clinical characteristics to predict the risk of stroke
- All scores provide a rough estimate of risk of thrombosis in a population at similar risk as patient being reviewed

## Risk-Based Antithrombotic Therapy

Recommendations	COR	LOE
In patients with AF, antithrombotic therapy should be individualized based on shared decision making after discussion of the absolute risks and RRs of stroke and bleeding and the patient's values and preferences.	I	C
Selection of antithrombotic therapy should be based on the risk of thromboembolism irrespective of whether the AF pattern is paroxysmal, persistent, or permanent.	I	B
In patients with nonvalvular AF, the CHA <sub>2</sub> DS <sub>2</sub> -VASc* score is recommended for assessment of stroke risk.	I	B
For patients with AF who have mechanical heart valves, warfarin is recommended, and the target INR intensity (2.0 to 3.0 or 2.5 to 3.5) should be based on the type and location of the prosthesis.	I	B

\*CHA<sub>2</sub>DS<sub>2</sub>-VASc indicates Congestive heart failure, Hypertension, Age ≥75 years (doubled), Diabetes mellitus, Prior Stroke or TIA or thromboembolism (doubled), Vascular disease, Age 65 to 74 years, Sex category.



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## CHA<sub>2</sub>DS<sub>2</sub>-VASc

2009 Birmingham Schema Expressed as a Point-Based Scoring System

Risk Factor	Score
Congestive heart failure/LV dysfunction	1
Hypertension	1
Age ≥ 75 y	2
Diabetes mellitus	1
Stroke/TIA/TE	2
Vascular disease <i>(prior myocardial infarction, peripheral artery disease, or aortic plaque)</i>	1
Age 65-74 y	1
Sex category <i>(i.e. female gender)</i>	1

LV = left ventricular; TE = thromboembolism



Lip GY, Newlaar R, Pisters R, Lane DA, Crijs HJ. Chest. 2010 Feb;137(2):263-72. Pub Med PMID: 19762550.

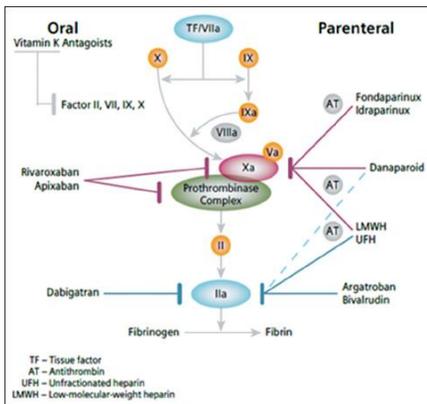
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## Risk-Based Antithrombotic Therapy (cont'd)

Recommendations	COR	LOE
For patients with nonvalvular AF with prior stroke, transient ischemic attack, or a CHA <sub>2</sub> DS <sub>2</sub> -VASc score of ≥ 2, oral anticoagulants are recommended. Options include:	I	A
• warfarin (INR 2.0 TO 3.0), or	I	B
• dabigatran, or	I	B
• rivaroxaban, or	I	B
• apixaban.	I	B
Among patients treated with warfarin, the INR should be determined at least weekly during initiation of antithrombotic therapy and at least monthly when anticoagulation (INR in range) is stable.	I	A
For patients with nonvalvular AF unable to maintain a therapeutic INR level with warfarin, use of a direct thrombin or factor Xa inhibitor (dabigatran, rivaroxaban, or apixaban) is recommended.	I	C
Re-evaluation of the need for and choice of antithrombotic therapy at periodic intervals is recommended to reassess stroke and bleeding risks.	I	C

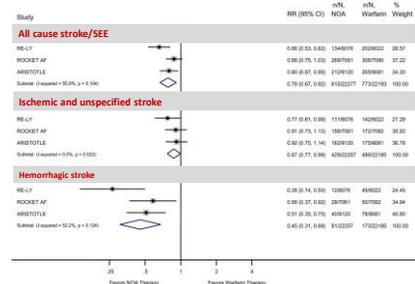


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## Meta-analysis of Efficacy and Safety of New Oral Anticoagulants

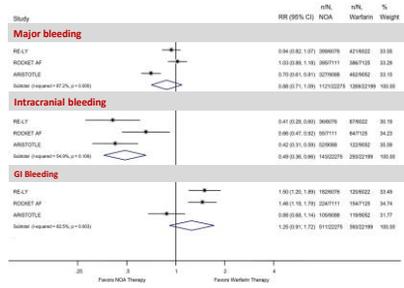
Dabigatran, Rivaroxaban, Apixaban vs. Warfarin in AF patients



Miller CS, Grandi SM, Shimony A, Filion KB, Eisenberg MJ. Am J Cardiol. 2012 Aug 1;110(3):453-60. Pub Med PMID: 22537354.

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## Risk-Based Antithrombotic Therapy (cont'd)

Recommendations	COR	LOE
For patients with nonvalvular AF and a CHA <sub>2</sub> DS <sub>2</sub> -VASc score of 0, it is reasonable to omit antithrombotic therapy.	Ila	B
For patients with nonvalvular AF with a CHA <sub>2</sub> DS <sub>2</sub> -VASc score of ≥ 2 and who have end-stage CKD (CrCl <15 mL/min) or are on hemodialysis, it is reasonable to prescribe warfarin (INR 2.0 to 3.0) for oral anticoagulation.	Ila	B
For patients with nonvalvular AF and a CHA <sub>2</sub> DS <sub>2</sub> -VASc score of 1, no antithrombotic therapy or treatment with an oral anticoagulant or aspirin may be considered.	Iib	C
For patients with nonvalvular AF and moderate-to-severe CKD with CHA <sub>2</sub> DS <sub>2</sub> -VASc scores of ≥ 2, treatment with reduced doses of direct thrombin or factor Xa inhibitors may be considered (e.g., dabigatran, rivaroxaban, or apixaban), but safety and efficacy have not been established.	Iib	C



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## Overall

- ◆ Stroke risk is high in patients with Afib.
- ◆ All patients need to be evaluated for risk of stroke.
- ◆ Number of therapies are available and effective for stroke prevention:
  - ◆ Warfarin
  - ◆ Dabigatran
  - ◆ Rivaroxaban, Apixaban, Edoxaban

## Atrial Fibrillation

UNM College of Pharmacy –  
Pharmacy-based Population Health  
Model for the Detection of (Silent) Atrial  
Fibrillation\*

\*Supported by a grant from Bristol-Myer Squibb  
Foundation for Global Medical Impact

## Overall Goal

- ◆ The overall goal of the program is to establish a sustainable and portable platform to screen for unrecognized atrial fibrillation and to increase overall population and health care awareness of risk of stroke with atrial fibrillation.

## Specific Goal

- ◆ The specific goal is to embed atrial fibrillation screening as a standard part of Doctor of Pharmacy student-driven health fairs and advanced community pharmacy clinical rotations.

## Long Term Goal

- ◆ Our long-term goal is to create a reproducible atrial fibrillation screening model accessible to every College and School of Pharmacy (N=140) for student-driven health fairs and advanced community pharmacy clinical rotations across the country serving as a force multiplier, enabling cost-effective screening of thousands of patients each year.

## Detecting Atrial Fibrillation



## First Goal - Health Fair Screenings

### RESULTS

- Have screened over 700 patients
- Analyzed results from 408 patients
- Age range – 18 - 80 years
- Detected possible atrial fibrillation in 12 patients with previously undiagnosed atrial fibrillation!

## Next Step - Community Pharmacies

- Innovative clinical service
- Can be driven by pharmacy students and pharmacy technicians
- Time efficient
- Value added service for your pharmacy
- Help your patients
- Screening can help prevent stroke and death
- Increase public awareness

## Process - Community Pharmacies

- APPE students/Pharmacists/Pharmacy Techs identify patients at high risk for A-fib through profile review (CV drugs or Diabetic drugs or > 50 yrs old)
- If patient agrees patient is screened for A-fib (< 1 min)
- If negative -patient is counseled on A-Fib with AHA Flyer
- If positive -
  - Ask permission to call their PCP to discuss results (set up appt)
  - Give patient “Dear Doctor Card” – explaining results
  - Counsel patient with AHA Flyer
- Give patient a postage-paid post card (survey) to mail back
- Complete patient data collection form

Patient Data Collection Form

Pharmacy: \_\_\_\_\_ Patient: \_\_\_\_\_

Patient is > 50 years old AND/OR on one of the following:

**Medication Profile (Check all that apply)**

<input type="checkbox"/> ACE-inhibitor or ARB	<input type="checkbox"/> Anticoagulant
<input type="checkbox"/> Beta-Adrenergic Blocker	<input type="checkbox"/> Antipsychotic
<input type="checkbox"/> Calcium Channel Blocker	<input type="checkbox"/> Anti-diabetic agents
<input type="checkbox"/> Diuretic	<input type="checkbox"/> Vasodilators (e.g. nitrates, hydralazine)
<input type="checkbox"/> Hypercholesterolemia Agents (e.g. Statins)	

Male or Female \_\_\_\_\_ DOB or Age: \_\_\_\_\_

Patient did not agree to Afib assessment AND AHA educational flyer was given to the patient.

Patient agreed to Afib assessment AND:

**Atrial Fibrillation Assessment**

Result from Single-Strap Device: Possible AFib Normal Unclassified Unavailable

If Possible Atrial Fibrillation was detected please check or circle box #1 or #2:

#1.  The pharmacy contacted the patient's provider while the patient was in the pharmacy. Describe the outcome (use back of sheet if necessary)?

#2.  The patient indicate that they would follow-up with their provider on their own.

**Patient Result Card For Possible Atrial Fibrillation**

Patient Result Card given to patient.

**Education and Post Card:**

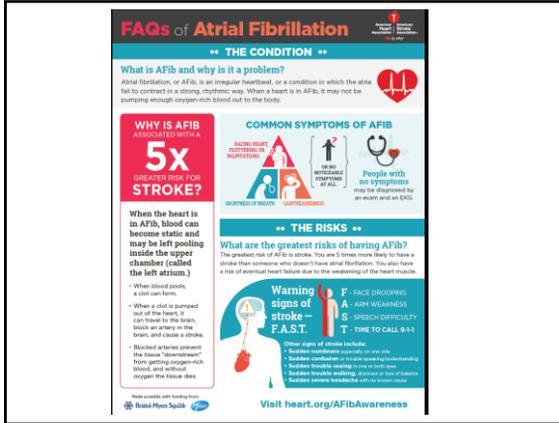
AHA Flyer was presented to the patient  AHA Flyer was discussed with the patient

Postcard given to Patient

**Time**

The time frame for this patient encounter for Afib assessment and education (circle one):

<30 minutes  30-60 minutes  > 60 minutes



Dear Doctor,

Your patient recently participated underwent screening for atrial fibrillation at your patient's community pharmacy provided by the University of New Mexico College of Pharmacy students and faculty on \_\_\_\_\_. We screened for atrial fibrillation using Alivecor's KardiaMobile EKG monitor which uses a FDA-approved algorithm to detect atrial fibrillation. During the screening the KardiaMobile detected possible atrial fibrillation in your patient. We discussed the results with your patient and recommended that they schedule a visit with you as soon as possible. If you have any questions, please feel free to contact Dr. Barry Bleske at 505-272-1525 (bbleske@salud.unm.edu) or Dr. Joe Anderson at 505-272-3664 (janderson@salud.unm.edu). Thank you.

Dear Patient,

As we talked about, we possibly detected an irregular heart rhythm known as atrial fibrillation. Atrial fibrillation is a very serious health condition that can lead to stroke if not treated. Treatment often consists of using a blood thinner to decrease the risk of stroke. We strongly recommend that you see your doctor **AS SOON AS POSSIBLE** to further evaluate your heart rhythm. Please present this card to your doctor which explains our findings from today on the other side. Thank you.

Dear patient,

Thank you for talking with us about the irregular heart rhythm called atrial fibrillation (AFib) and participating in the screening. To help us figure out how well we are doing, we would like to ask you a few questions. These questions are voluntary and the answers will be kept anonymous. We greatly appreciate your participation and feedback!

- Do you feel that the screen for irregular heart rhythm, AFib, was (please circle):
 

Worth the time	Somewhat worth the time	Not worth the time
----------------	-------------------------	--------------------
- Do you feel that learning about AFib, an irregular heart rhythm, from your pharmacy is (please circle):
 

Important	Somewhat important	Not important at all
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- If recommended that you follow-up with your doctor regarding our findings today of an irregular heart rhythm and we did not contact your doctor for you, did you contact the doctor in about a one week time frame? (please circle)
 

Yes	No	I did not have atrial fibrillation
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Please provide any additional comments:

- ## UNM Process – Students
- ◆ Training – P4
    - ◆ Review Online Modules (Moodle)
    - ◆ Pass competency Quiz (70%)
    - ◆ Review patient simulation video
    - ◆ Demonstrate competency with Kardia Mobile
    - ◆ Demonstrate competency with patient education and counseling.
    - ◆ Familiarity with forms and process

- ## Community Pharmacies
- ◆ Preceptor, Pharmacy Tech option
    - ◆ Review online modules (can receive 2hr CPE credit)
  - ◆ Study Folder
    - ◆ I-phone with app, charger
    - ◆ Kardia mobile device with extra battery
    - ◆ Counseling Forms, Patient Script
    - ◆ Data collection forms
    - ◆ Dear Doctor Cards
    - ◆ Post Cards
  - ◆ Store signage if interested

- ## Outcomes
- Early detection can prevent stroke and other complications associated with atrial fibrillation.
    - Potential to decrease health care costs
  - Important public health initiative *driven by Community Pharmacies and Colleges of Pharmacies!*
    - Evolve into innovative clinical program in the community setting. Change practice. Reimbursement?
    - Unique learning opportunity for pharmacy students
  - HELPS PATIENTS