

Atrial Fibrillation

(A-Fib)

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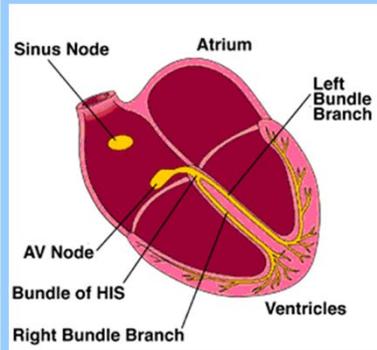
Outline

- **Definition** - What is Atrial Fibrillation?
- **Epidemiology**
- **Treatment:** Anticoagulation
Rate vs. Rhythm
- **Drugs**
- **Afib ablation** – success, complications, costs
- **What's Next**

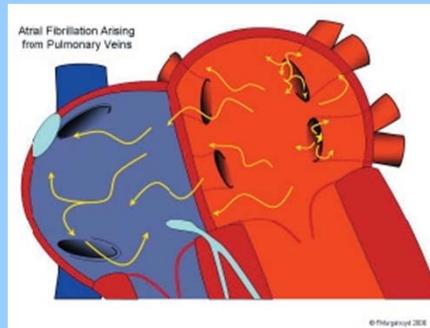


Cardiac Conduction System

Normal



Atrial Fibrillation



What is A-Fib?

- Atrial fibrillation is chaotic electrical rhythm from the Left upper chamber (300 beats per min)
- The atrium quiver, instead of organized contraction
- The electrical impulses travel to the ventricles → irregular and usually rapid heart rate.



Symptoms of A-fib

- Heart palpitations - Sudden pounding, fluttering or racing sensation in the chest.
- Lack of energy or feeling over-tired.
- Dizziness - Feeling lightheaded or faint.
- Chest discomfort - Pain, pressure, or discomfort in the chest.
- Shortness of breath - Having difficulty breathing during normal activities or even at rest
- No Symptoms

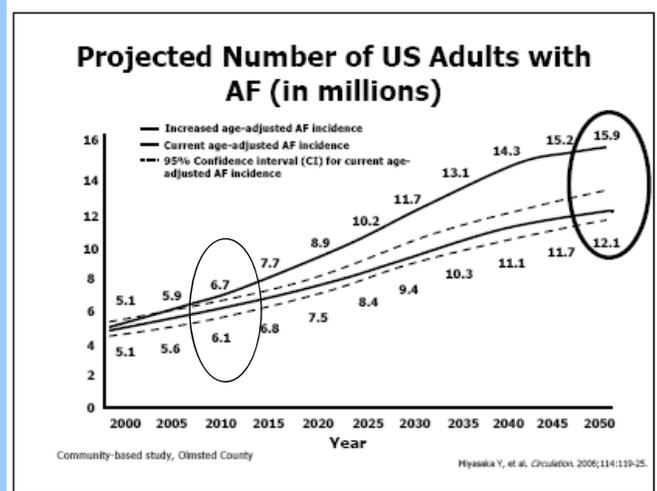


What Causes Afib?

- **Unknown**
 - Heart failure
 - Thyroid Abnormality
- Hypertension (high blood pressure)
 - Congenital heart disease
 - Chronic lung disease
 - Coronary artery disease
 - Heart valve disease
 - After heart surgery
- Cardiomyopathy (Heart Failure)
 - Pulmonary embolism

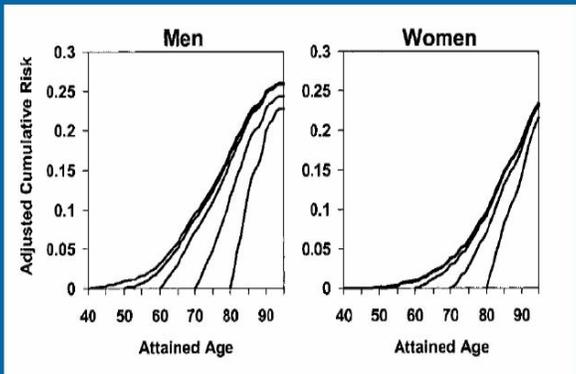


EPIDEMIOLOGY



EPIDEMIOLOGY

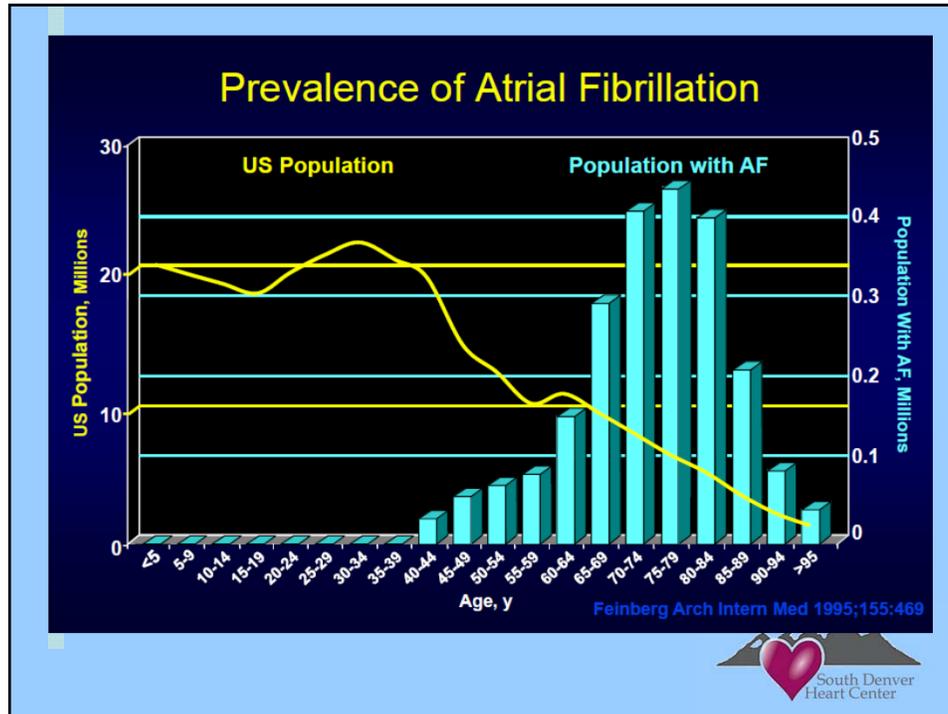
Framingham analysis



Lloyd-Jones et al., Circ. 110:1042-6, 2004

Men and women have a **1 in 4 lifetime risk** of developing AF





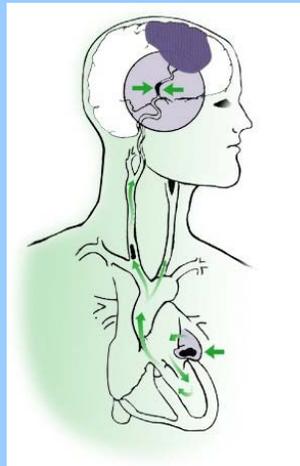
Why is A-Fib Dangerous?

- Usually progressive gets worse over time
- **Decrease the heart's pumping ability by as much as 20 to 25 percent.**
- Atrial fibrillation, combined with a fast heart rate over a long period of time, can result in heart failure.

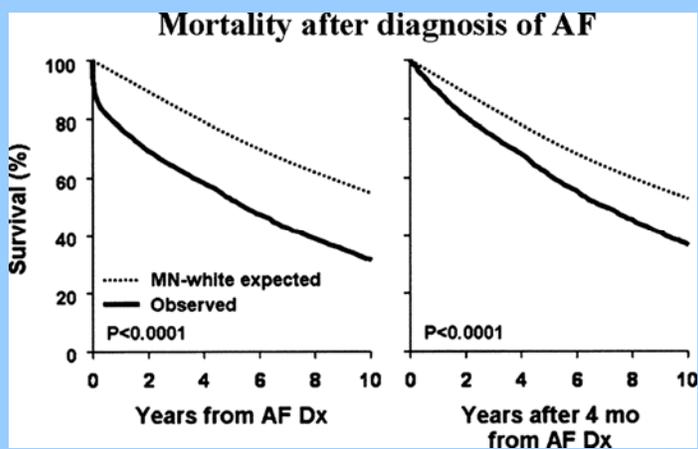


Stroke

- Blood clots form because blood doesn't move well
- Clot can travel to brain → Stroke
- **5-7x more likely to have a stroke** than the general population.



Mortality

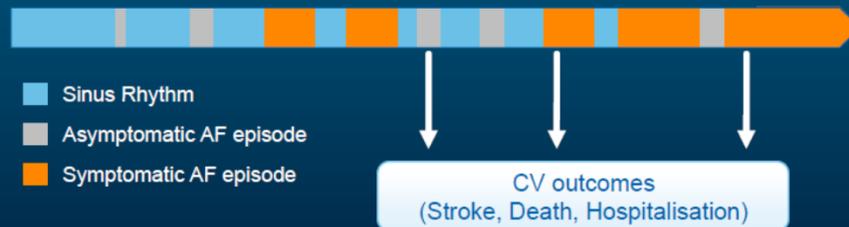


Anter, E. et al. Circulation 2009;119:2516-2525



Progression of Atrial Fibrillation

From first onset to permanent
From uncomplicated to significant co-morbidities/consequences



Tests for Afib

1. A review of your medical history
2. Echocardiogram (echo)
3. Complete physical examination
4. Holter monitor test
5. Electrocardiogram (ECG)
6. Other tests, as needed



Treatment

- Anticoagulation (Blood Thinning)
 - Rate Control
 - Rhythm Control



Anticoagulation with non-valvular A-Fib = **CHADS₂**

C	CHF	=1	} =0 → Aspirin 325mg = 1 → Aspirin 325mg or warfarin =2+ → warfarin/ New direct Thrombin Inhibitors
H	Hypertension	=1	
A	Age ≥ 75	=1	
D	Diabetes	=1	
S₂	Stroke/embolic	= 2	

ACC/AHA Atrial Fibrillation Anticoagulation Guidelines, JACC 2012.



Old vs. New Blood Thinners

OLD

Warfarin (Coumadin)

- + Well known
- + Easy to reverse
- + Cheap
- + Once a day
- Need frequent monitor
- Vit K dependant

New

Dabigatran (Pradaxa)
Rivaroxaban (Xarelto)
Abixiban (Eliquis)

- + Not Vit K
- + No monitoring
- + 34% better at preventing stroke
- \$
- Stomach upset
- can be twice a day



Approaches

Symptoms

No

Yes

Rate Control

Rhythm Control

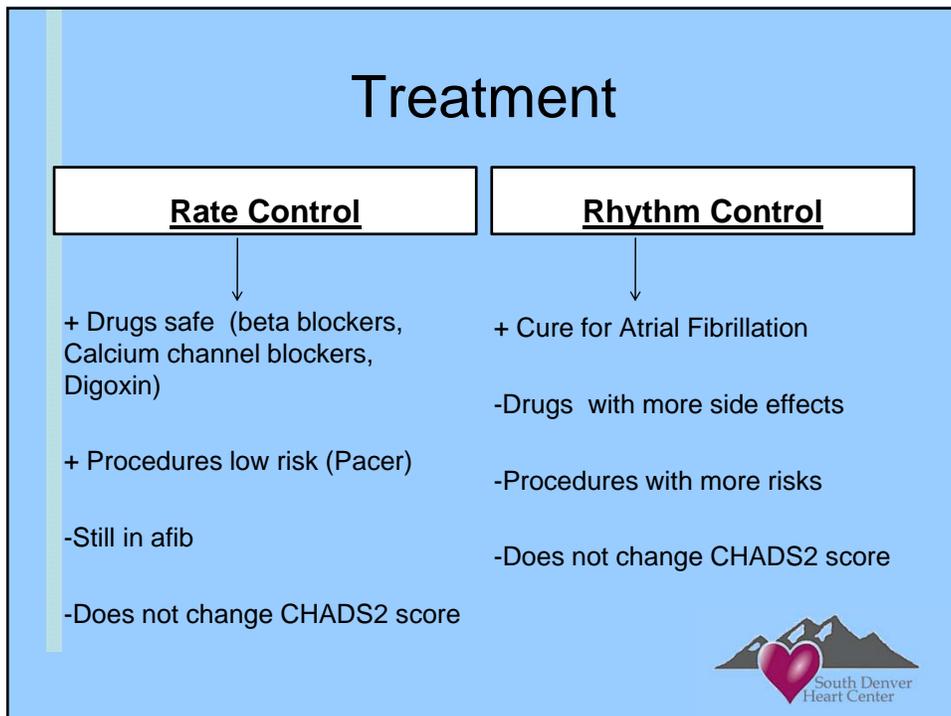
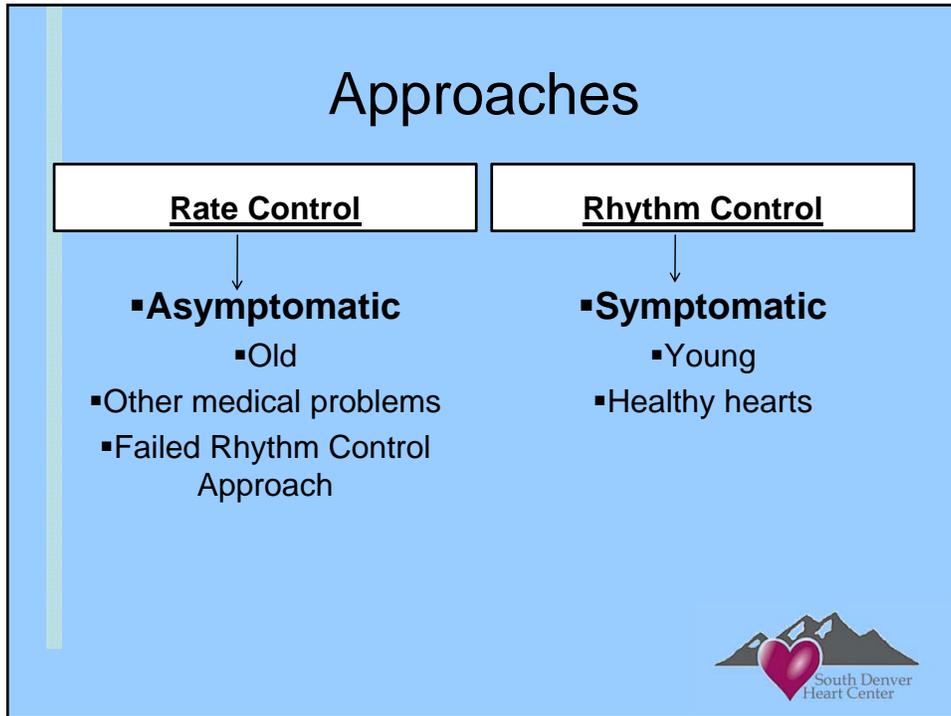
Avoid fast or slow rates

Keep normal rhythm

Feel bad when heart rates not controlled

Much harder to do





Cardioversion (Electrical Shock)

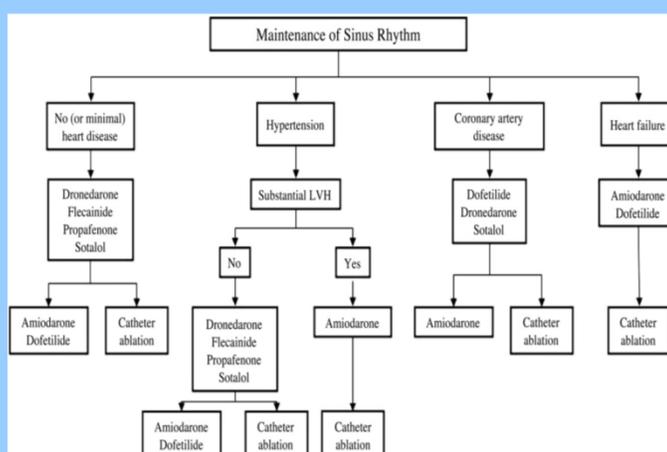
3 days → 86% in Normal Rhythm
 1 year → 23% in Normal Rhythm
 2 Years → 16% in Normal Rhythm

- Temporary measure only
- **Main Purpose** → Determine symptoms (which approach?)

ACC/AHA/ESC Atrial Fibrillation Guidelines 2006



Rhythm Control Drugs



ACC/AHA/ESC Atrial Fibrillation Guidelines 2012



Traditional Results of Antiarrhythmic Drugs at One Year

Beta Blockers - 0-10%

Dronedaronone – 30%

Propafenone, Flecainide, Sotalol – 50% → 30%

Dofetilide – 60%

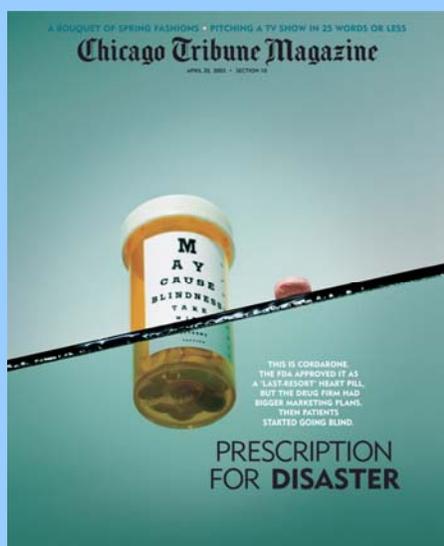
Amiodarone – 65%

Ablation – 70% → 80%

Surgical Maze – 80%



Side Effects of Amiodarone



Side Effects of Amiodarone



Pigmentation Related to Amiodarone

N Engl J Med, Vol. 345, No. 20 - November 15, 2001



Side Effects of Amiodarone

Table 1. Adverse Effects of Oral Amiodarone.

Adverse Effect	Incidence	Recommended Monitoring	Special Considerations
Cardiac			
Bradycardia	5%	Baseline electrocardiogram at least once during loading period, especially if conduction disease is present; yearly thereafter	Consider reduction of loading dose in elderly patients and those with underlying sinoatrial or atrioventricular conduction disease; reduce dose or discontinue if QT interval exceeds 550 msec
Prolonged QT interval	In most patients		
Torsades de pointes	<1%		
Hepatic	15%	Aspartate and alanine aminotransferase measurements at baseline and every 6 months thereafter	Avoid in patients with severe liver disease
Thyroid		Thyroid-function tests at baseline and two or three times a year thereafter	Avoid in presence of preexisting, non-functioning thyroid nodule; higher incidence of thyroid effects in patients with autoimmune thyroid disease
Hyperthyroidism	3%		
Hypothyroidism	20%		
Pulmonary	<3%	Pulmonary-function tests at baseline and if symptoms develop; chest radiograph at baseline and yearly thereafter	Discontinue amiodarone immediately if pulmonary effects suspected
Dermatologic	25-75%	Routine	Recommend use of sunscreen with a high sun protection factor
Neurologic	3-30%	Routine	Consider dose reduction
Ophthalmologic		Examination at baseline if there is underlying abnormality; examinations as needed thereafter	Avoid in presence of preexisting optic neuritis
Corneal deposits	100%		
Optic neuritis	<1%		

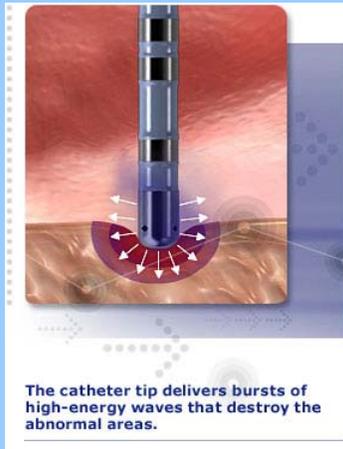
Side Effects:
75%

Side Effects
→
discontinue drug:
33%

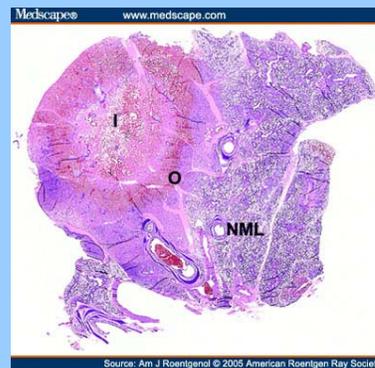
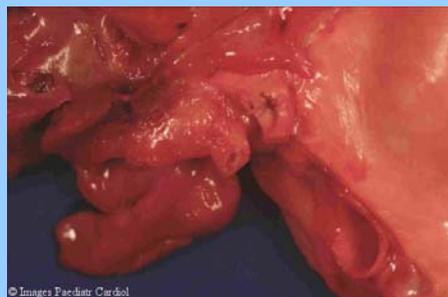
Zimetbaum, P. NEJM 2007. Vorperian VR. JACC 1997.



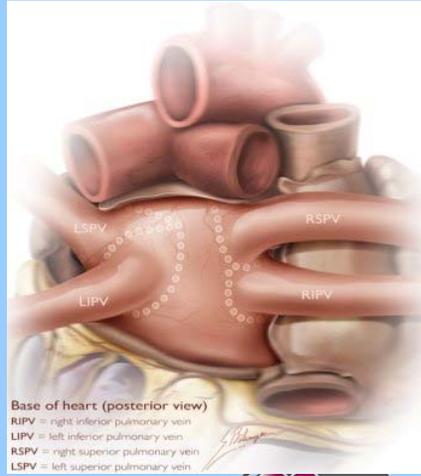
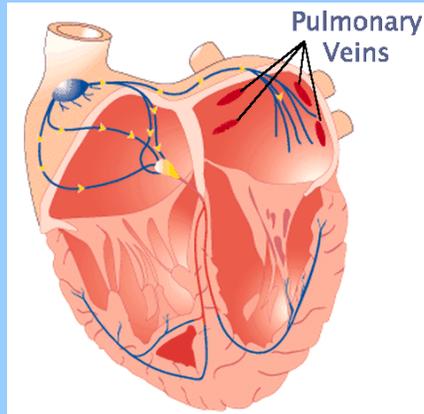
Ablation



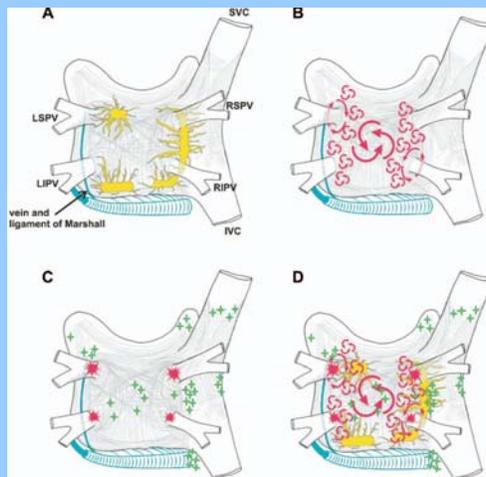
Ablation Lesion



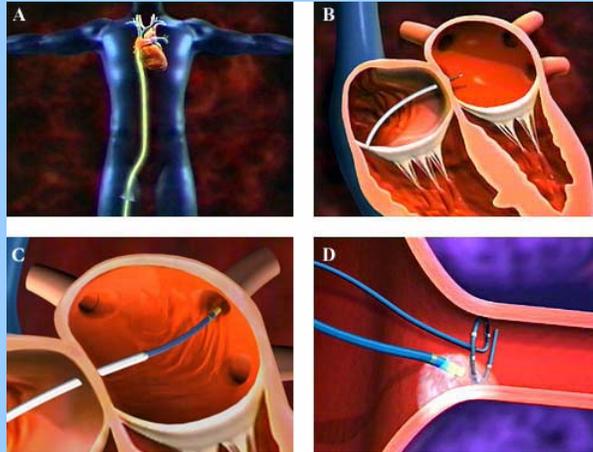
Pulmonary Veins



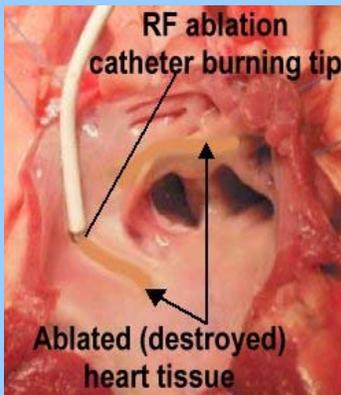
Mechanisms of A-fib



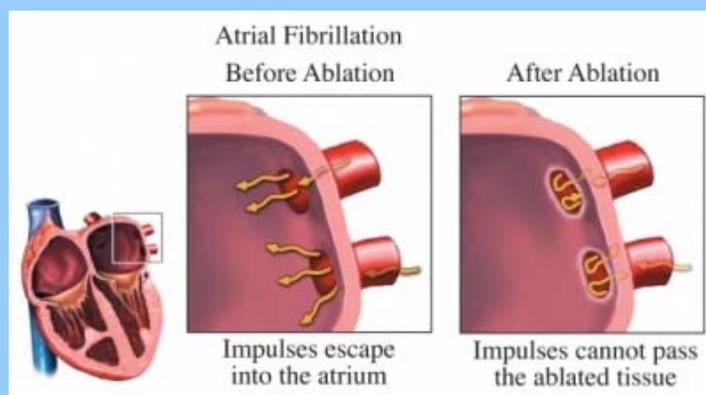
Atrial Fibrillation



Wide Area Circumferential Ablation (WACA)



Ablation



Who is candidate for A-fib ablation?

Optimal

Highly symptomatic
Paroxysmal afib
Age < 75
LA < 50 ml
No Sleep Apnea

Less Optimal

Minimally symptomatic
Persistant/Permanent
Age > 75
LA > 50 ml
Sleep Apnea



Atrial Fib Ablation Results

Paroxysmal

(Comes and goes):

-1 ablation → 70%

-2 ablations → 80%

Persistent:

(in all the time)

-1 ablation → 60%

-2 ablations → 70%

Atrial Fibrillation Ablation Summit, HRS, Boston 2012



Complications

1000 Atrial Fibrillation Ablation Procedures:

5-6% Total Procedure Complications

- 1 death (4 weeks later)
- 1.3% Tamponade – hole in heart
- 1.1% Vascular Complications (Groin)
- 0.4% Stroke
- 1 Atrioesophageal Fistula
- 1 Endocarditis – heart infection

Dagres, N. et al. J Cardiovasc Electrophysiology, May 2009.



Cost of Drugs vs. Ablation

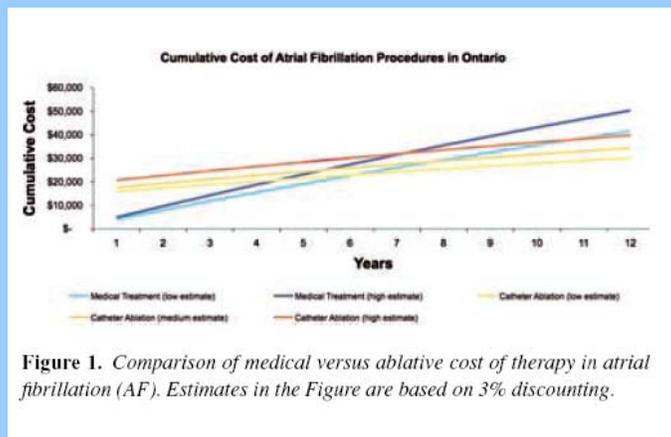
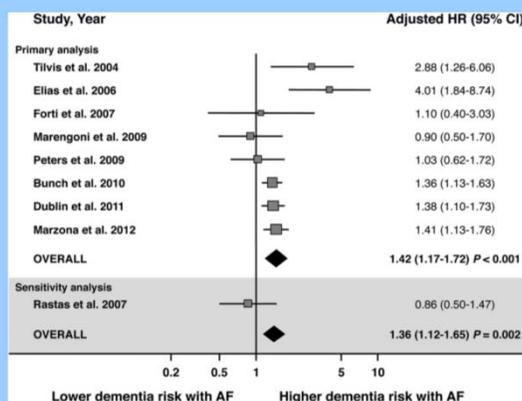


Figure 1. Comparison of medical versus ablative cost of therapy in atrial fibrillation (AF). Estimates in the Figure are based on 3% discounting.

... (J Cardiovasc Electrophysiol, Vol. 18, pp. 907-913, September 2007)



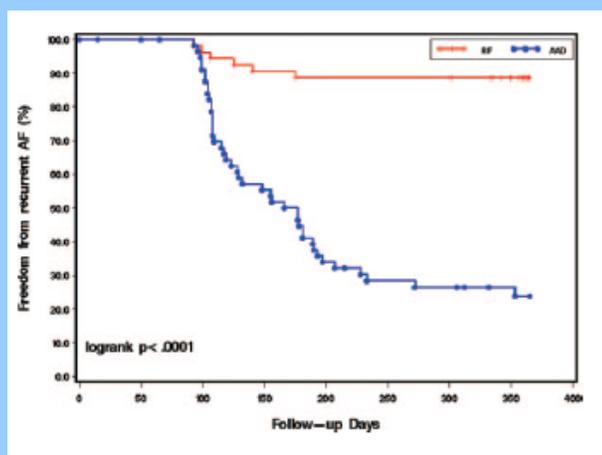
Dementia and Atrial Fibrillation



Santigelli, P, et al. Atrial Fibrillation and the Risk of Incident Dementia. Heart Rhythm 2012.



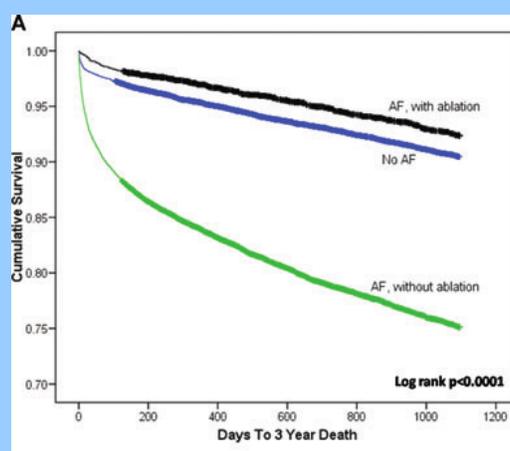
Ablation vs. Drugs



Jais P, et al. Circulation. 2008;118;2498-2505.



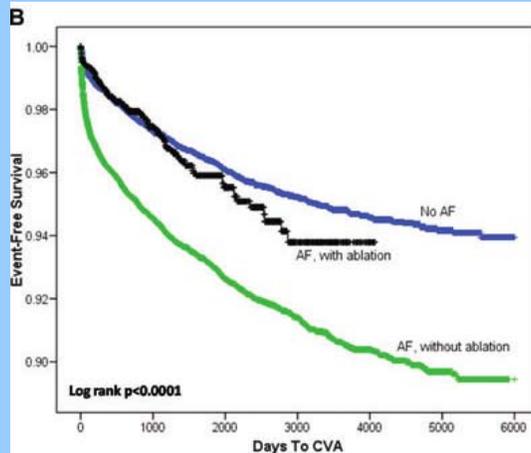
Reduction in Mortality



Bunch, J., et al, Journal Cardiovascular Electrophysiology, 2011.



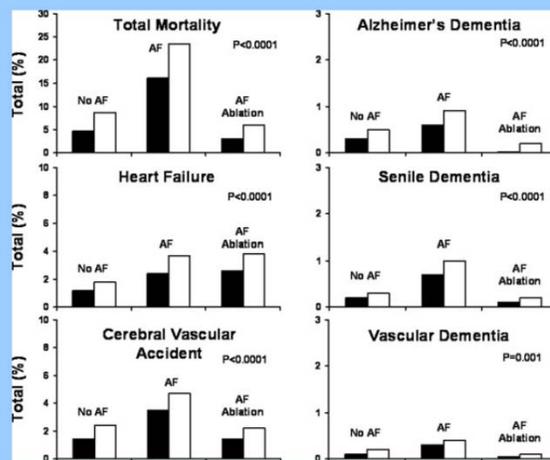
Reduction in Stroke



Bunch, J., et al, Journal Cardiovascular Electrophysiology, 2011.



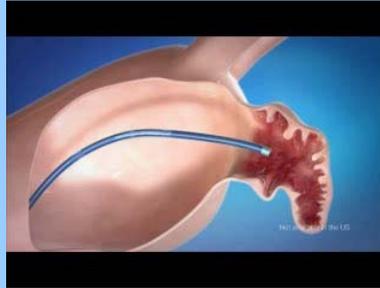
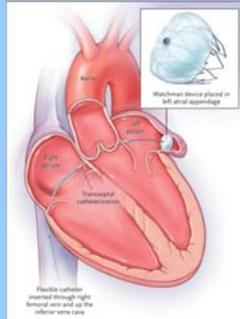
Reduction in Stroke, Heart Failure and Dementia



Bunch, J., et al, Journal Cardiovascular Electrophysiology, 2011.



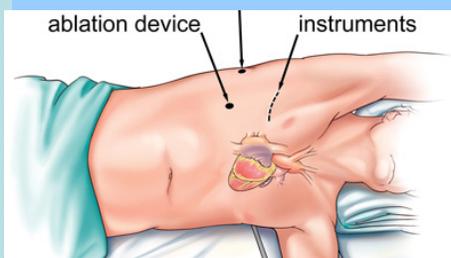
LA Appendage Occlusion



**Reduces Risk of stroke
(Same reduction as
warfarin/coumadin)**



Hybrid Approach – EP and Surgery



More Information

www.HRSonline.org

www.stopafib.org

www.A-fib.com



Conclusion

