Management of Atrial Fibrillation

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Case 1

- 51 year old male in AF at regular medical
- Asymptomatic

Three point plan for AF

- Stroke prevention
- Rate control
- Rhythm control

= prognostic benefit

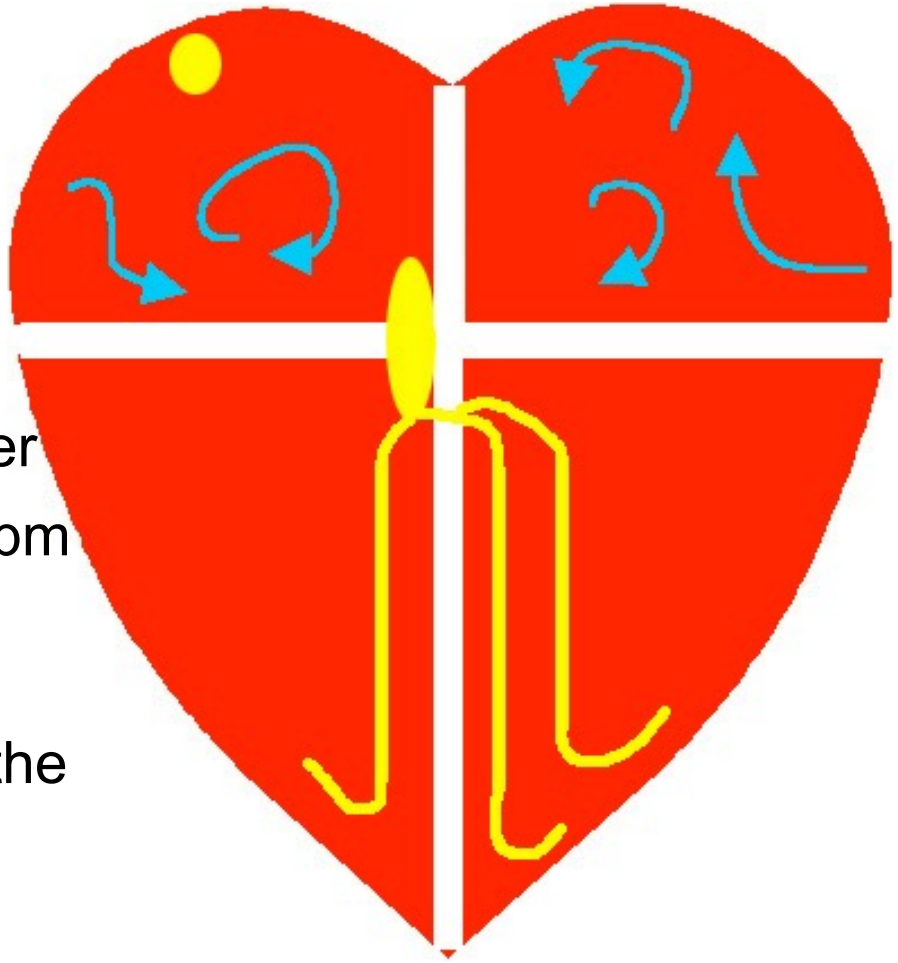
=?prognostic benefit

Camm et al EHJ 2010

AF mechanism

Key points that will help you explain AF

- The atria are minimally contractile hallways
- The AV node is a rate limiter
- Heart rate will reach 180 bpm during exercise in normal rhythm
- AF is associated with, not the cause of stroke



Why do I have AF?

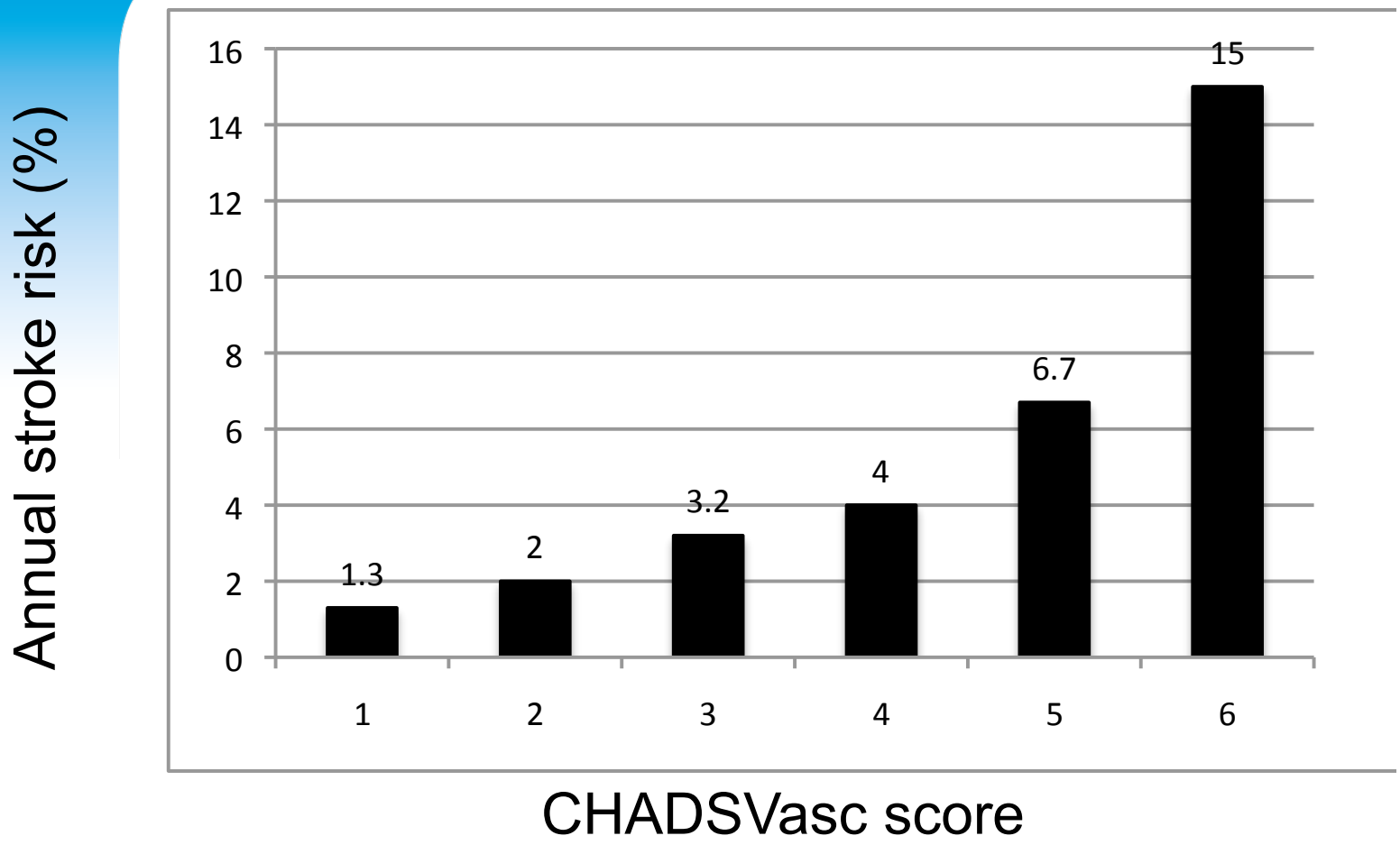
No causes, just factors:

- Mammal heart design
- Genetics
- Age
- Weight
- Alcohol
- Exercise
- Not caffeine

1) Stroke - Is he at risk?

Risk factor	Score
Congestive heart failure/LV dysfunction	1
Hypertension	1
Age ≥75	2
Diabetes mellitus	1
Stroke/TIA/thrombo-embolism	2
Vascular disease[a]	1
Age 65–74	1
Sex category (i.e. female sex)	1
Maximum score	**9**

Annual stroke risk per CHADSVasc score



Prevention of stroke

- Don’t bother with HASBled
- CHADSVasc>0 - I would
- CHADSVasc>1 - encourage
- DOAC - unless contraindication:
  - renal failure
  - extreme weight
  - extreme age

2) Heart rate

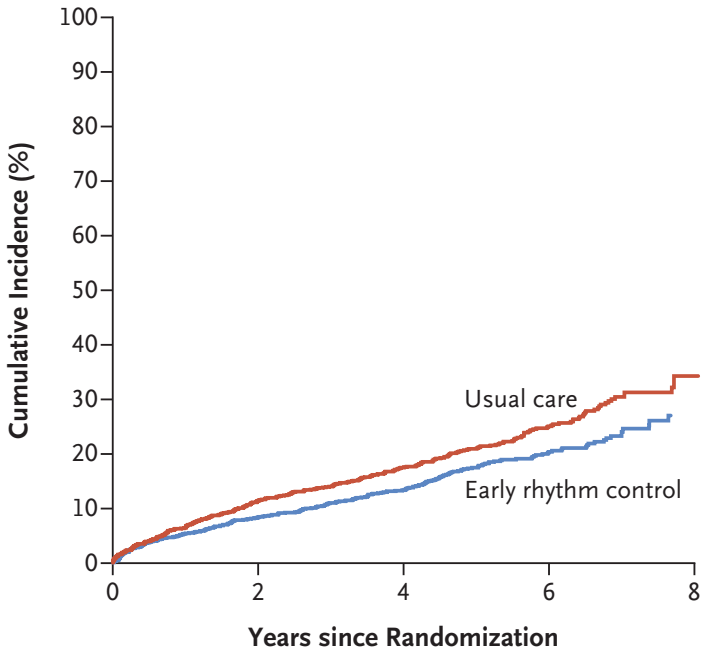
- Anything <110bpm on average is ok
- Check on ECG and confirm on Holter
- Options:
  - Bisoprolol - best but side effects
  - Adizem XL - start 120mg OD
  - Combinations of both

Rhythm control

- Conflicting evidence as to prognostic benefit
  - Original cardioversion/antiarrhythic drug trials - no benefit/harm
  - CABANA - positive for ablation but only when analysed by treatment
  - EAST - positive for rhythm control

Early rhythm control

- EAST:
  - 1395 rhythm
  - 1394 rate



No. at Risk					
Usual care	1394	1169	888	405	34
Early rhythm control	1395	1193	913	404	26

Figure 2. Aalen–Johansen Cumulative-Incidence Curves for the First Primary Outcome.

The first primary outcome was a composite of death from cardiovascular causes, stroke, or hospitalization with worsening of heart failure or acute coronary syndrome.

What do we do with our patient

- Stroke prevention - nothing (unless we intervene)
- Rate control (if heart rate >110 bpm)
- Rhythm control ?
  - Are you really asymptomatic - cardioversion
  - If not, is long term rhythm control your desire?
    - risk factor reduction (weight, alcohol, exercise)
    - long term antiarrhythmic drugs
    - catheter ablation

How do we monitor him?

- 3 month formal ECG/7-day Holter post intervention
- Patient owned ECG monitor
- Self administered pulse check
- ?annual follow up in primary care

Rhythm control is more dangerous than AF

- RACE
  - Mortality 22.6% vs 17.2%
  - 39% vs 10% in SR
- AFFIRM
  - Mortality 23.8% vs 21.3 %
  - ↑ hospitalisation
  - ↑ Side effects
  - SR has a prognostic benefit

Van Gelder et al NEJM 2002
AFFIRM investigators NEJM 2002

Rhythm control is more dangerous than AF

- AFFIRM sub-study

TABLE 2. Covariates Significantly Associated With Survival Results With Echocardiographic Data Included

Covariate	*P*	HR	HR: 99% Confidence Limits Lower	Upper
Age at enrollment*	<0.0001	1.06	1.05	1.08
Coronary artery disease	<0.0001	1.56	1.20	2.04
Congestive heart failure	<0.0001	1.57	1.18	2.09
Diabetes	<0.0001	1.56	1.17	2.07
Stroke or transient ischemic attack	<0.0001	1.70	1.24	2.33
Smoking	<0.0001	1.78	1.25	2.53
Left ventricular dysfunction	0.0065	1.36	1.02	1.81
Sinus rhythm	<0.0001	0.53	0.39	0.72
Warfarin use	<0.0001	0.50	0.37	0.69
Rhythm-control drug use	0.0005	1.49	1.11	2.01

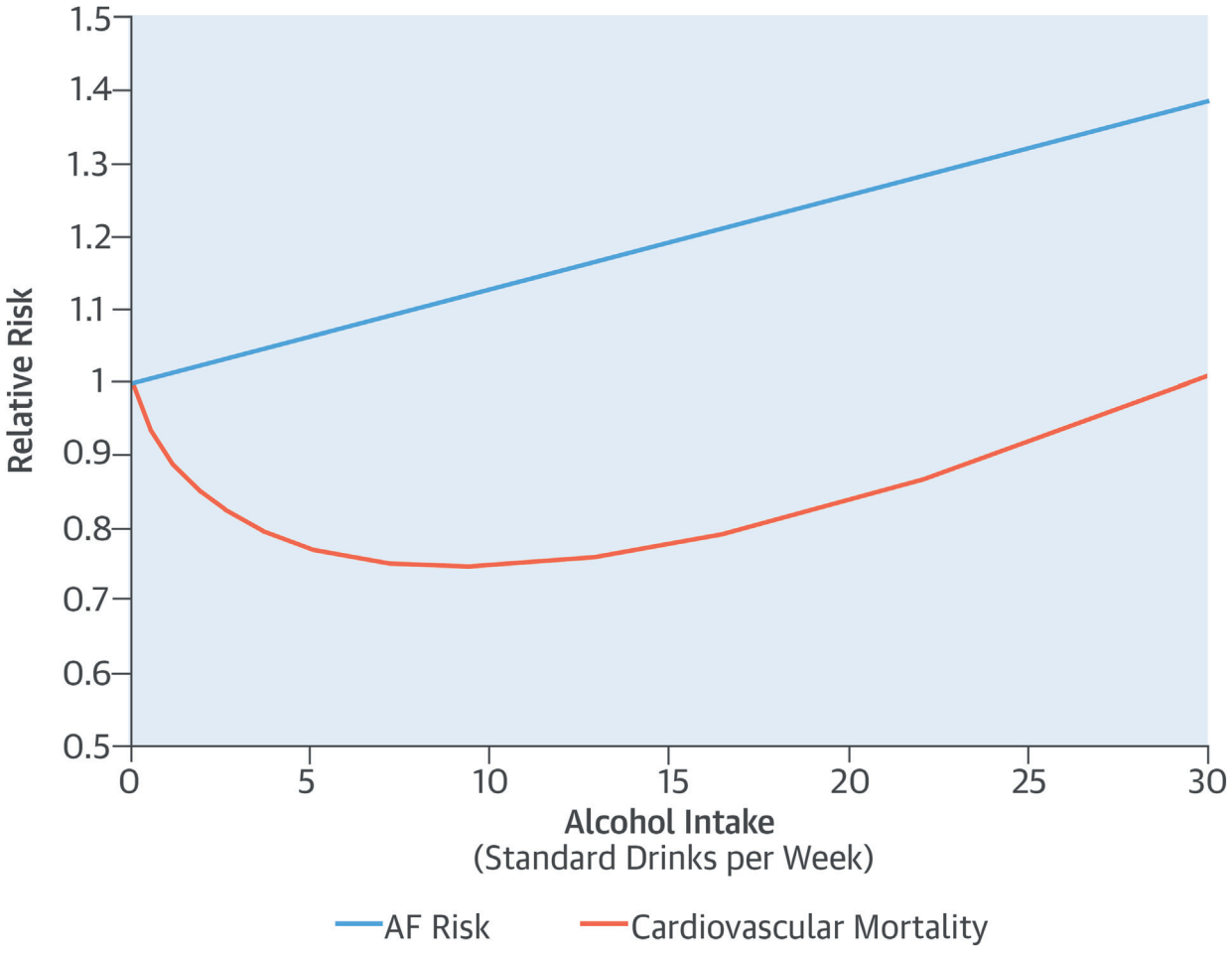
*Per year of age.

Epstein et al. Circ 2004

Factors promoting AF

- Age
- Genetics
- Mammalian design
- Hypertension
- Alcohol
- Obesity
- Fitness

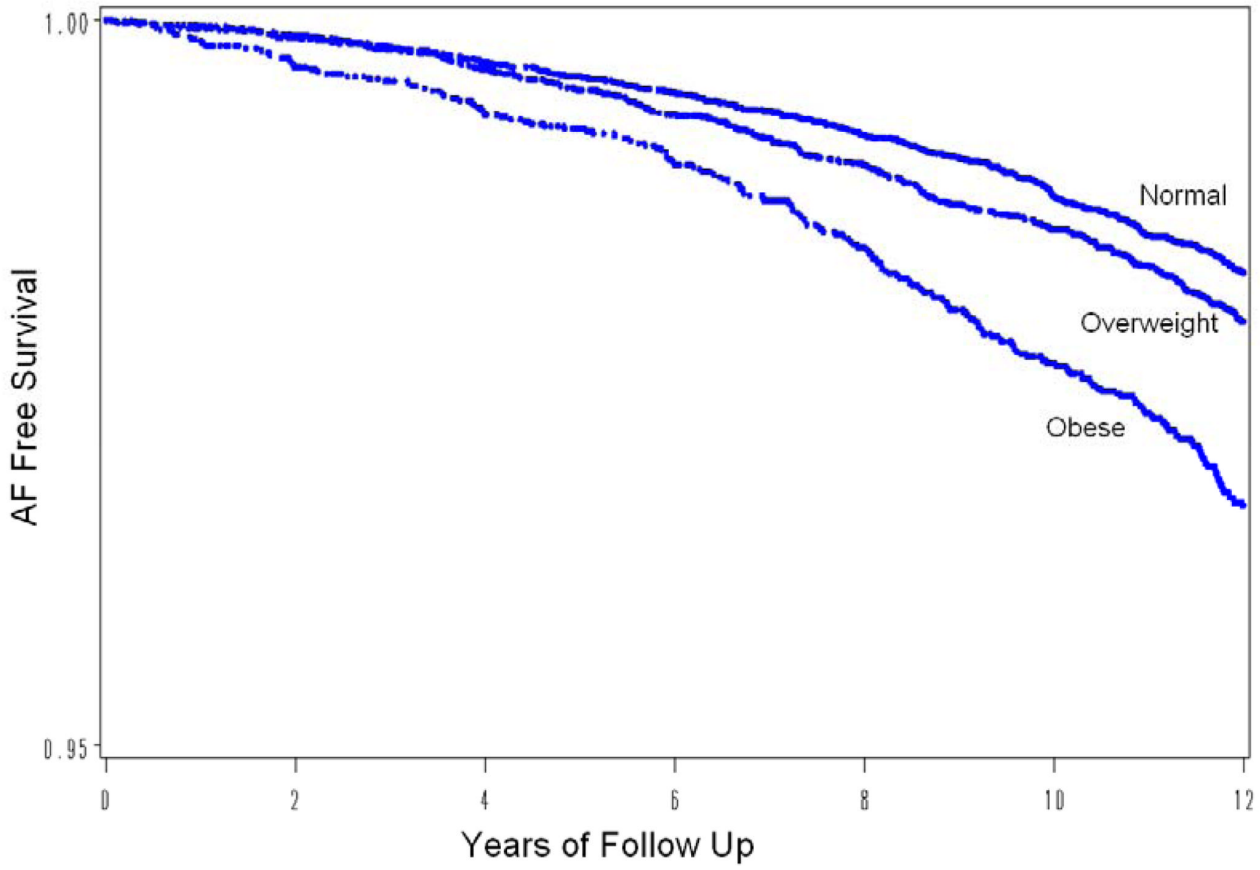
Alcohol and AF



Voskoboinik et al JACC 2016

Obesity and AF

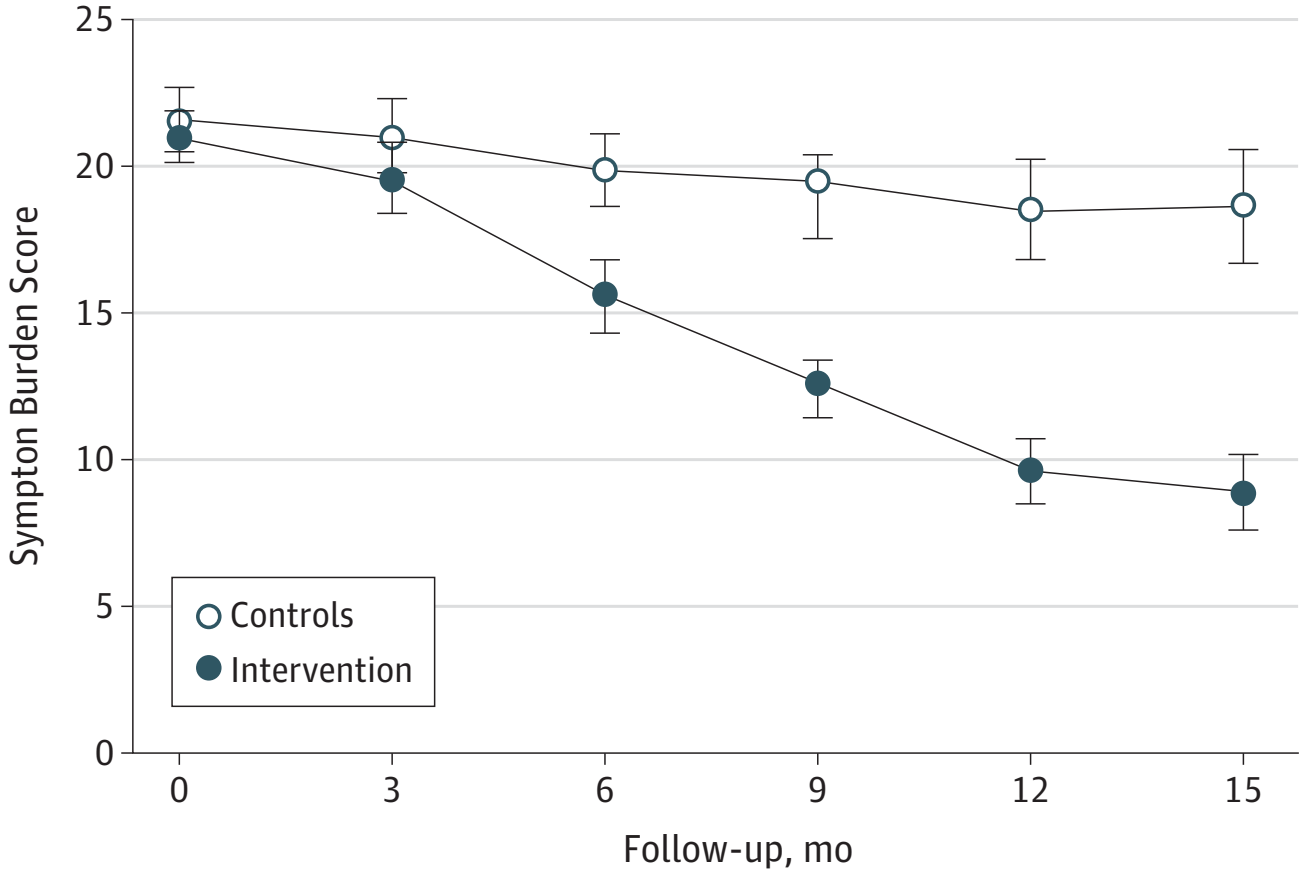
- Womens health study - 34,309 participants with 834 AF events



Tedrow et al JAMA 2010

Effect of intervention on AF

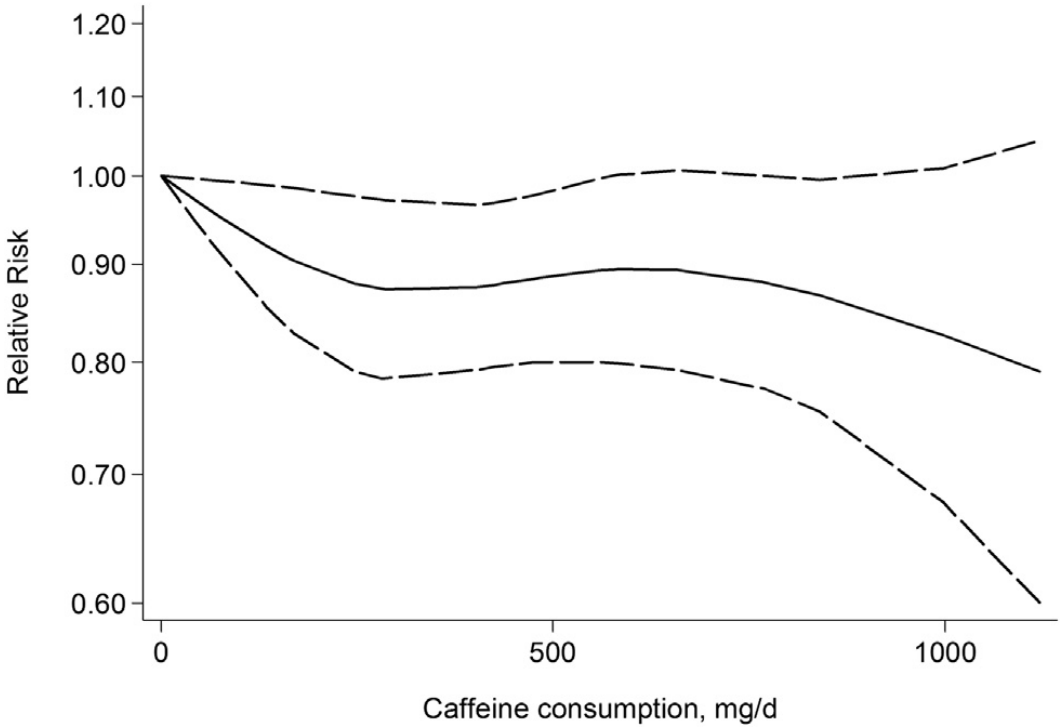
- 178 pts BMI >27 randomised to intervention vs control



Abed et al JAMA 2013

Caffeine and AF

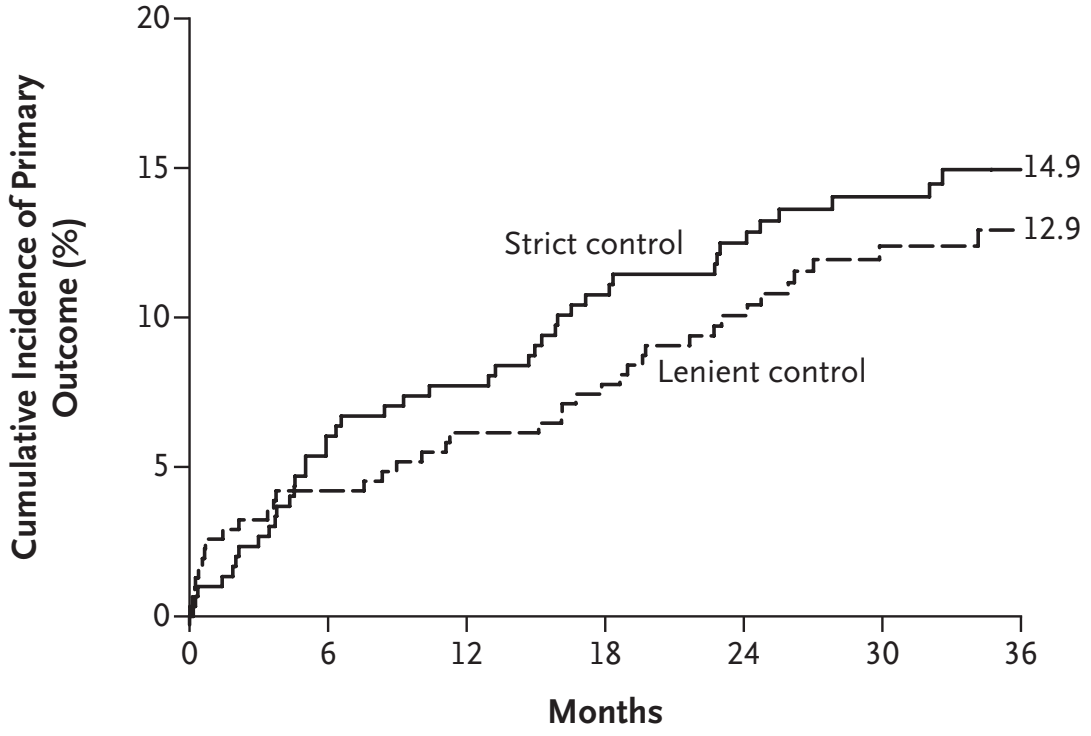
- Meta analysis 6 studies, 228,465 pts



Cheng et al Can J Cardiol 2014

Rate control

- Strict rate control has no advantage over lenient



No. at Risk							
Strict control	303	282	273	262	246	212	131
Lenient control	311	298	290	285	255	218	138

Van Gelder et al NEJM 2010

Step 2 Rate control

- A lenient heart rate control strategy is acceptable (resting HR<110) if asymptomatic
- Drugs of choice
  1. Beta-blockers
  2. Calcium channel blocker
  3. Both
  4. Digoxin

Step 2 Rate control

- Exceptions:
  - Reversible cause of AF
  - Heart Failure and AF
  - Acute onset AF (A+E)

Step 3 Rhythm control

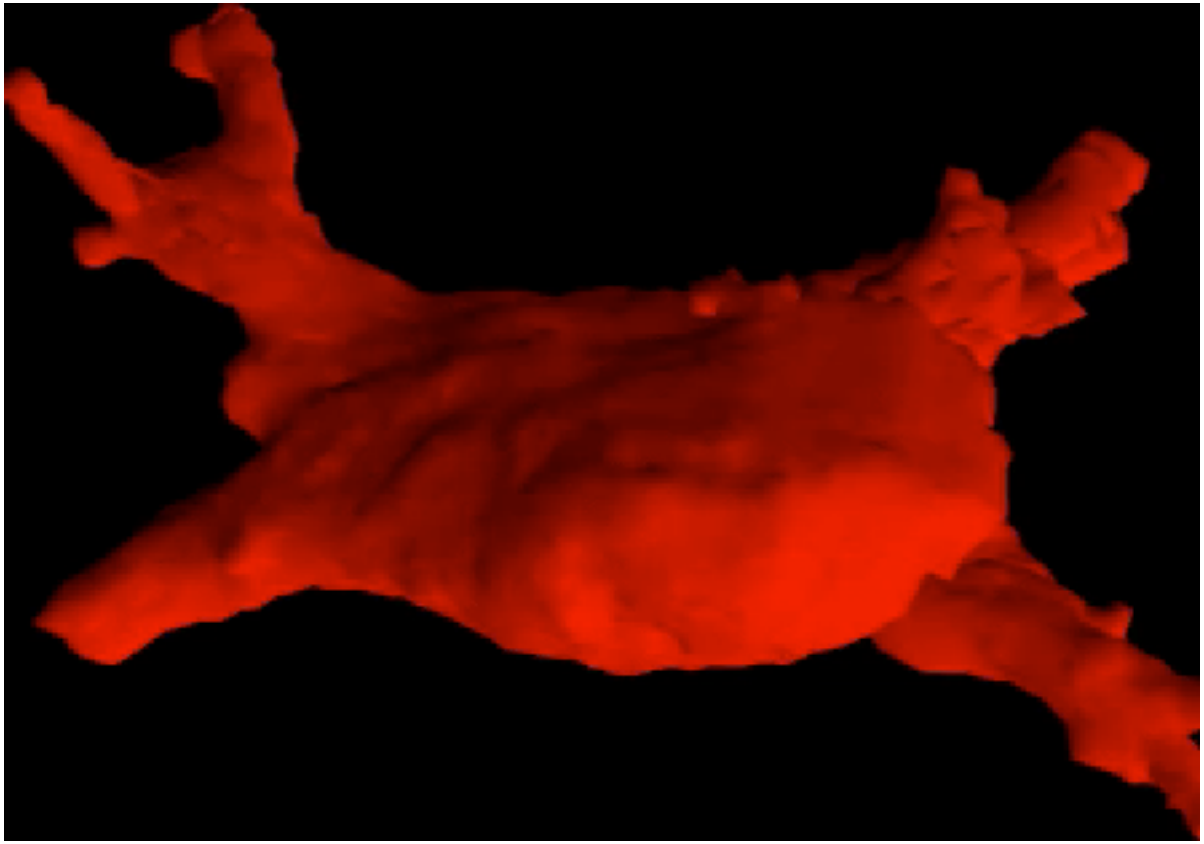
- Drug therapy
  - Normal heart - Flecainide
  - IHD - Sotalol
  - Structural heart disease - Dronedarone/Amiodarone
  - Heart failure - Amiodarone

DC cardioversion

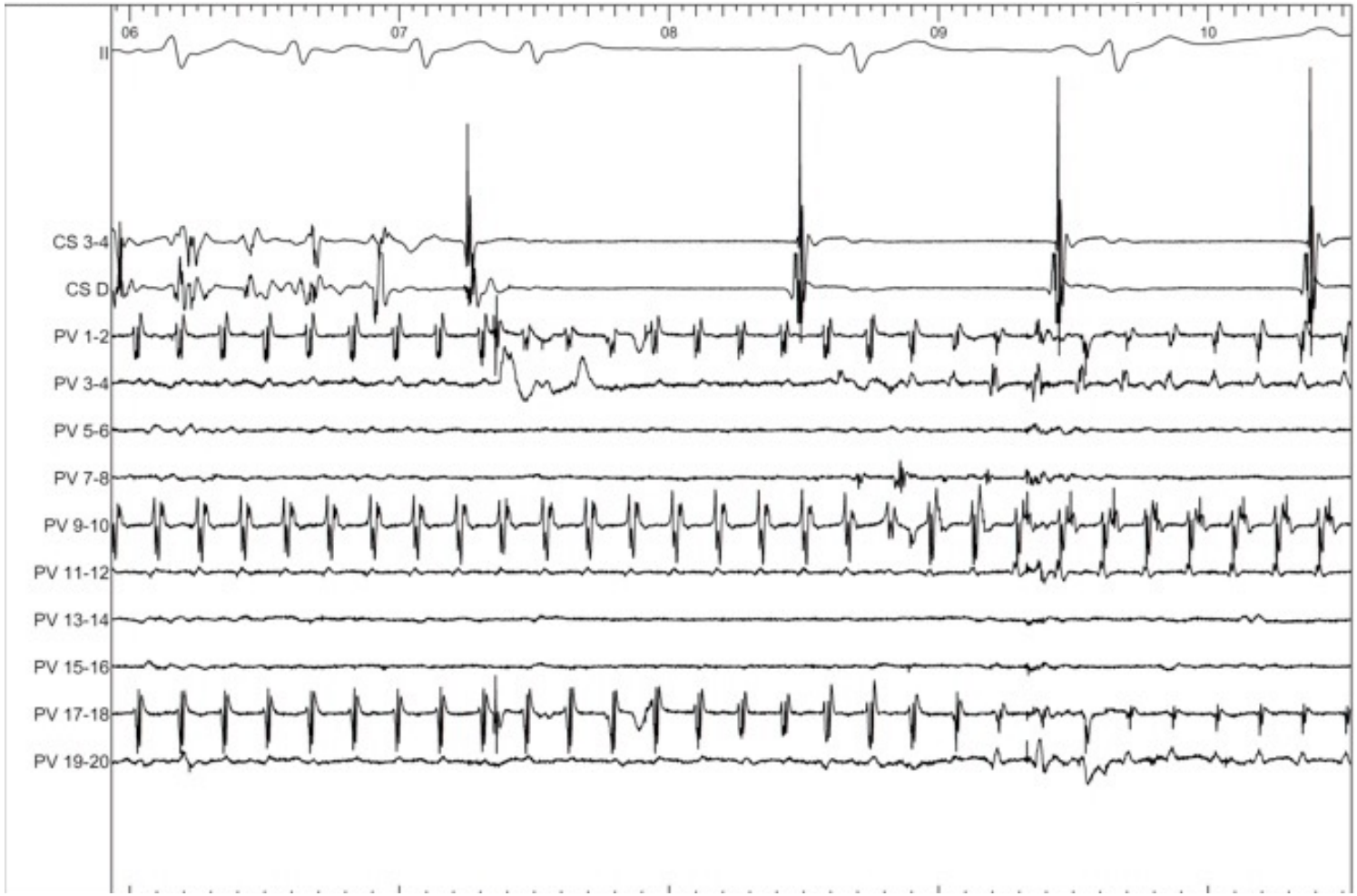
- At 1 year:
  - AF recurs 75% without antiarrhythmic
  - 40% with best antiarrhythmic (amiodarone)
- NICE - amiodarone 4 weeks and 12 months post CVersion

Step 4 - Catheter ablation

- Offer if drugs failed/contraindicated



PAF ablation



Persistent AF

- Atrial remodelling makes non-PV tissue "fibrillatory"

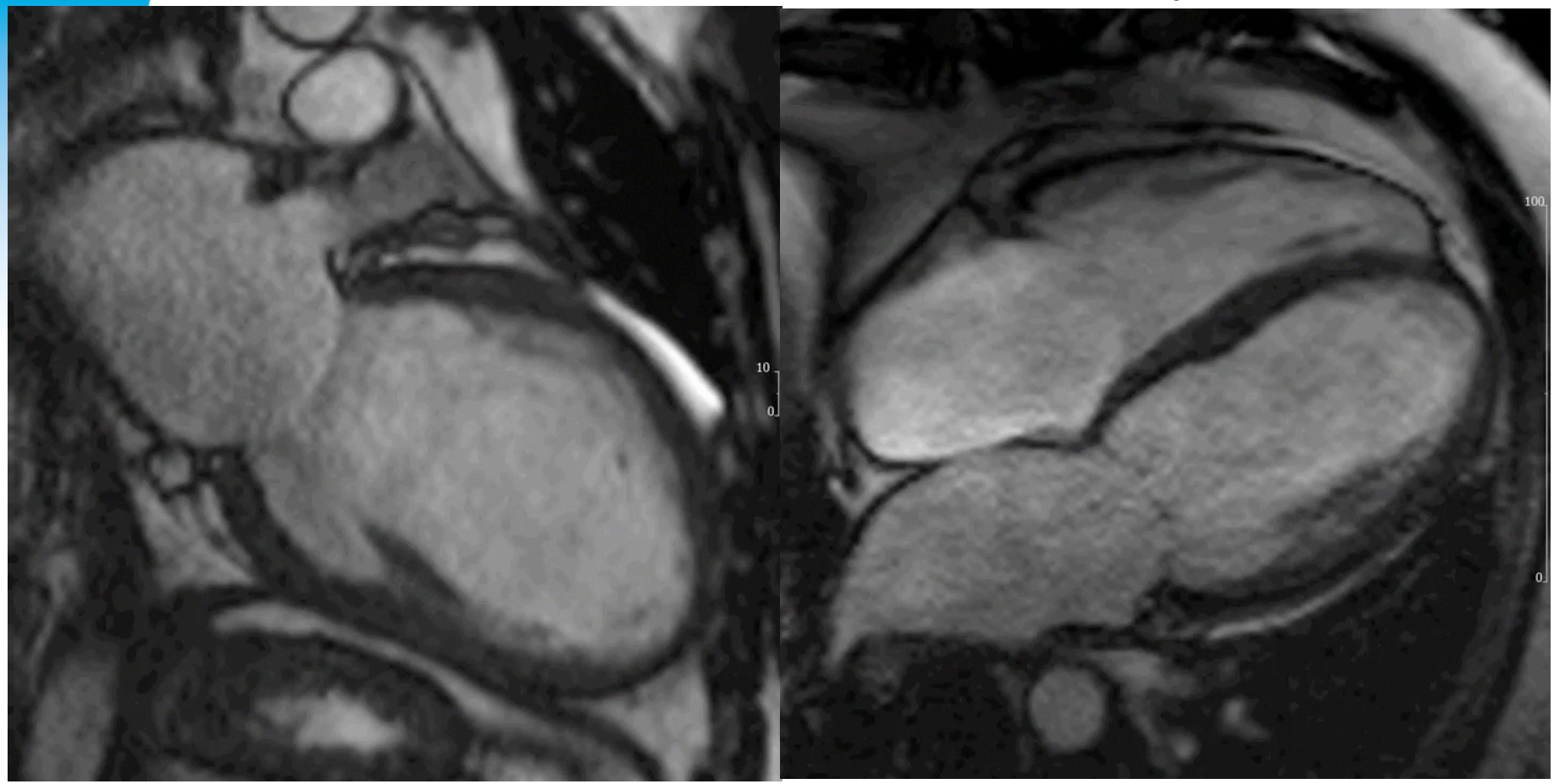
  PAF → Persistent → Permanent

  Genetic and environmental factors influence the rate

  - NICE 2014 - progress steps in < 4 weeks

AF ablation the outcome

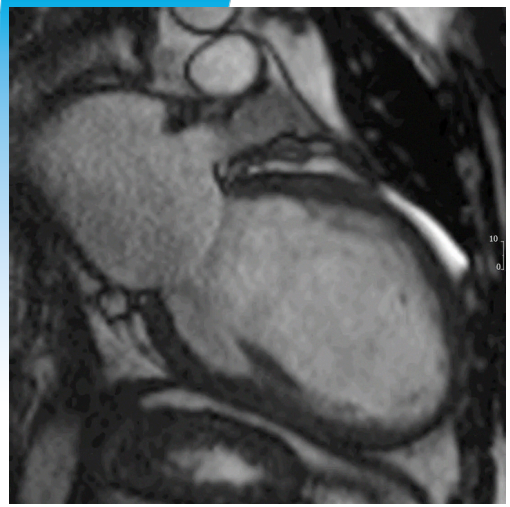
38 male 2 week incr SOB then pulmonary oedema



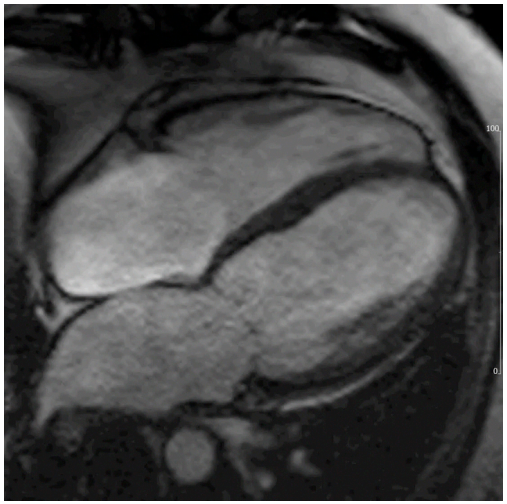
courtesy Dr Sam Mohiddin Barts Heart centre

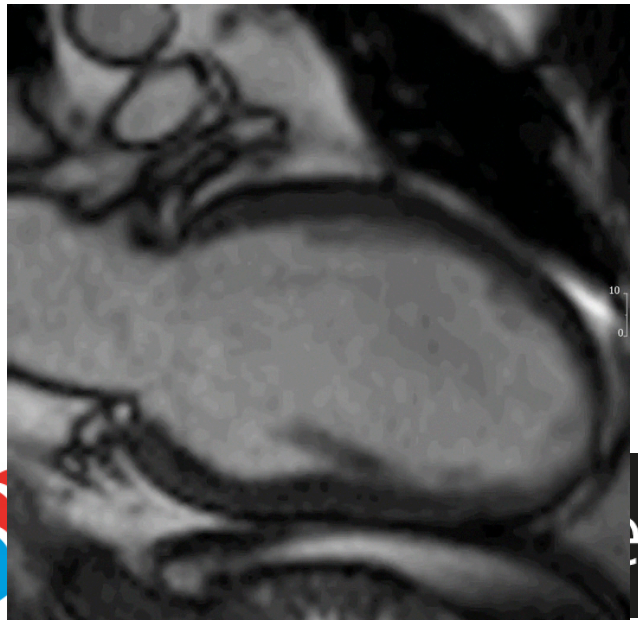
AF ablation the outcome

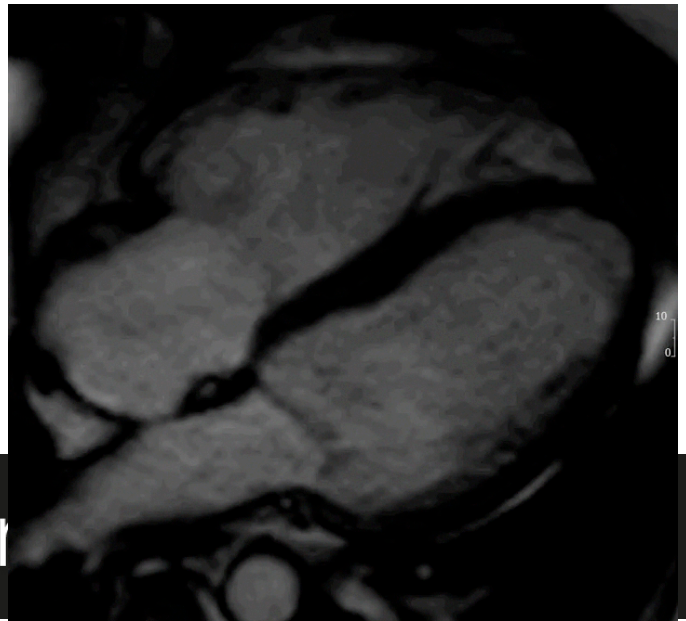
courtesy Dr Sam Mohiddin Barts Heart centre



Before



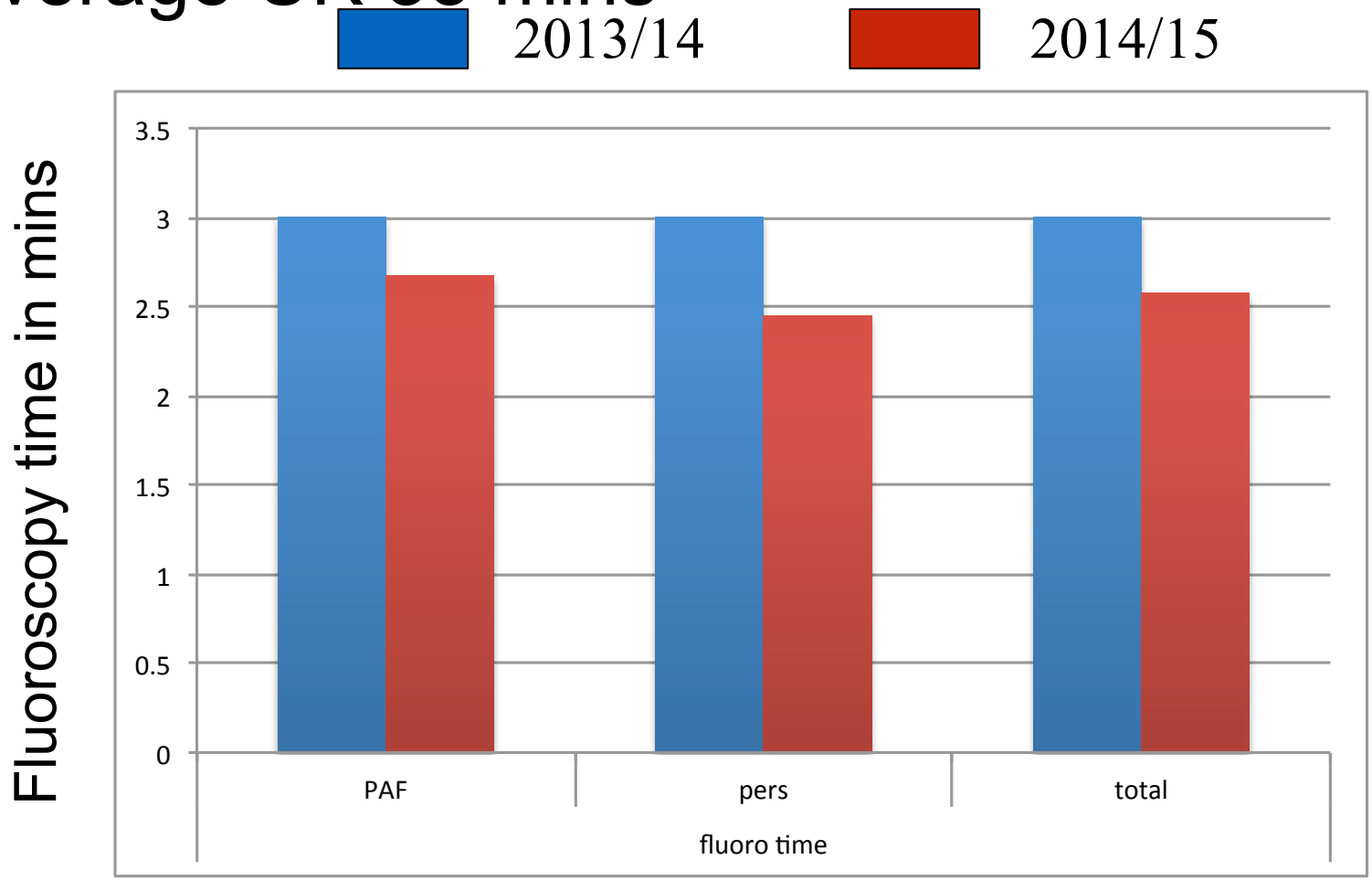




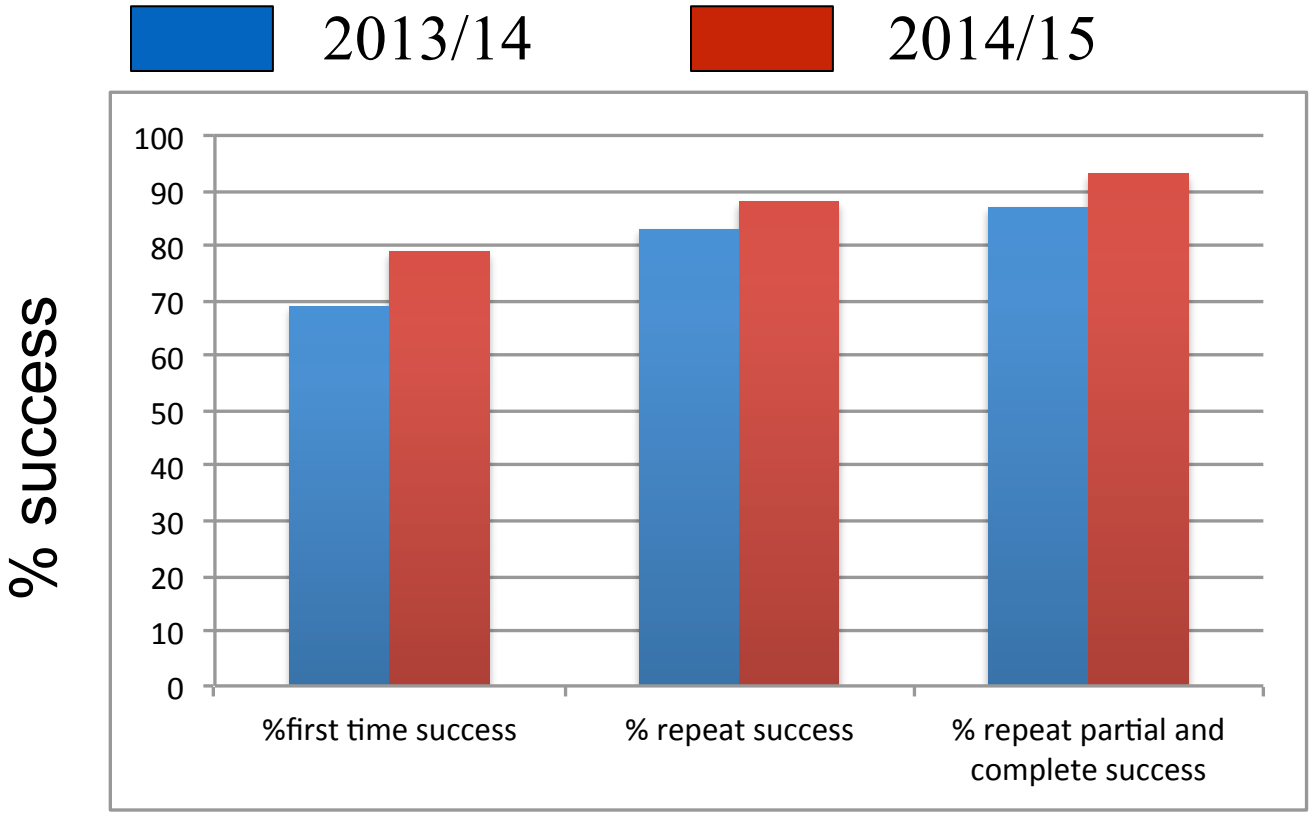
After

Impact of aviation safety philosophy

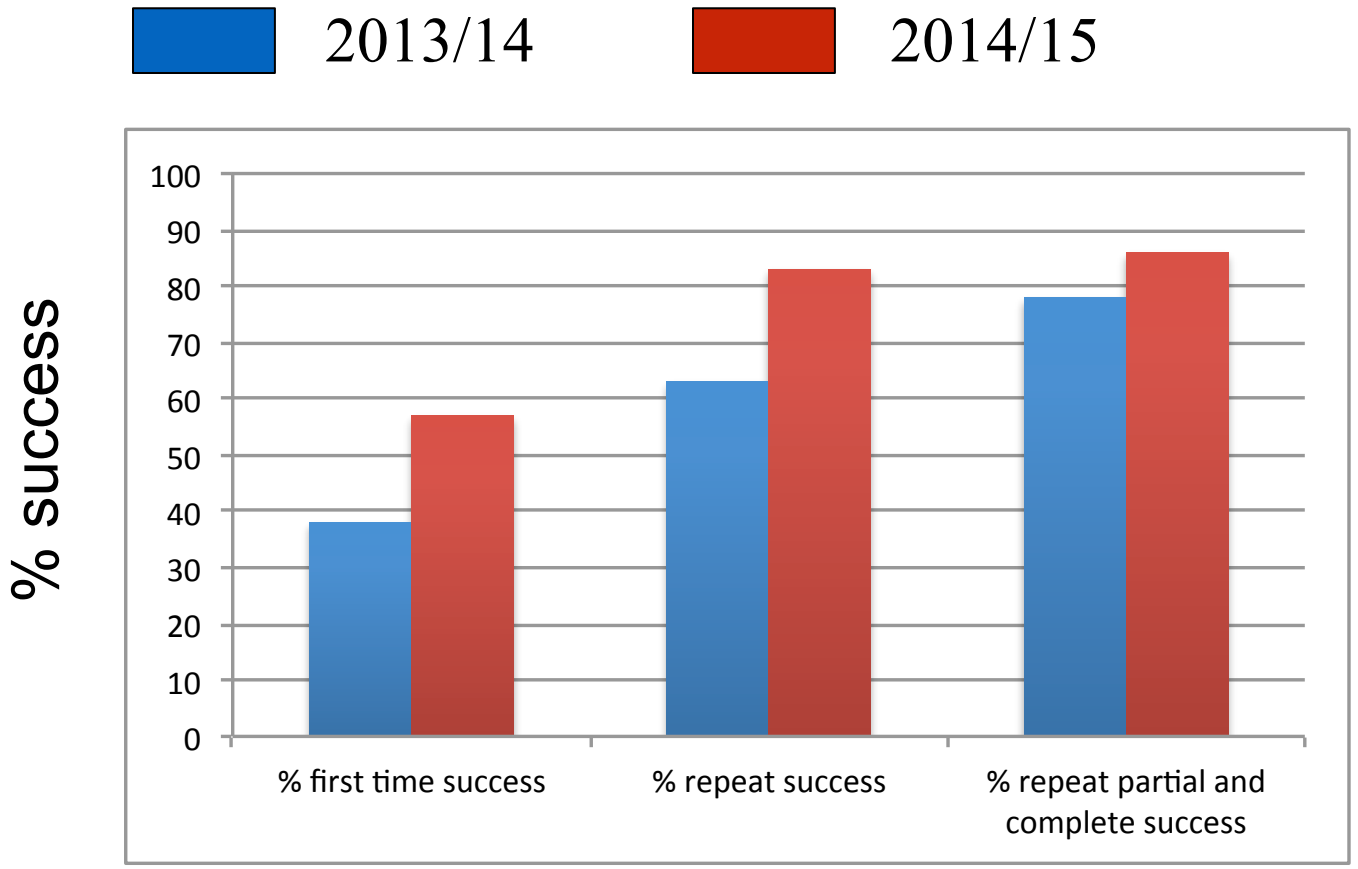
- Average UK 35 mins



PAF ablation outcomes



Persistent AF ablation outcomes



Conclusion

- Patients make the choice

1. Stroke prevention based on CHADSVasc score not symptoms or AF type
2. Rate vs Rhythm control
3. If rhythm:
   - Drugs (pill in pocket/regular meds)
   - Cardioversion and AAD for life
   - Catheter ablation

More info

- www.londonAFcentre.com

Case 1

- 35 year old man found to have AF on ECG at routine medical
  - Investigations?
  - Treatment?

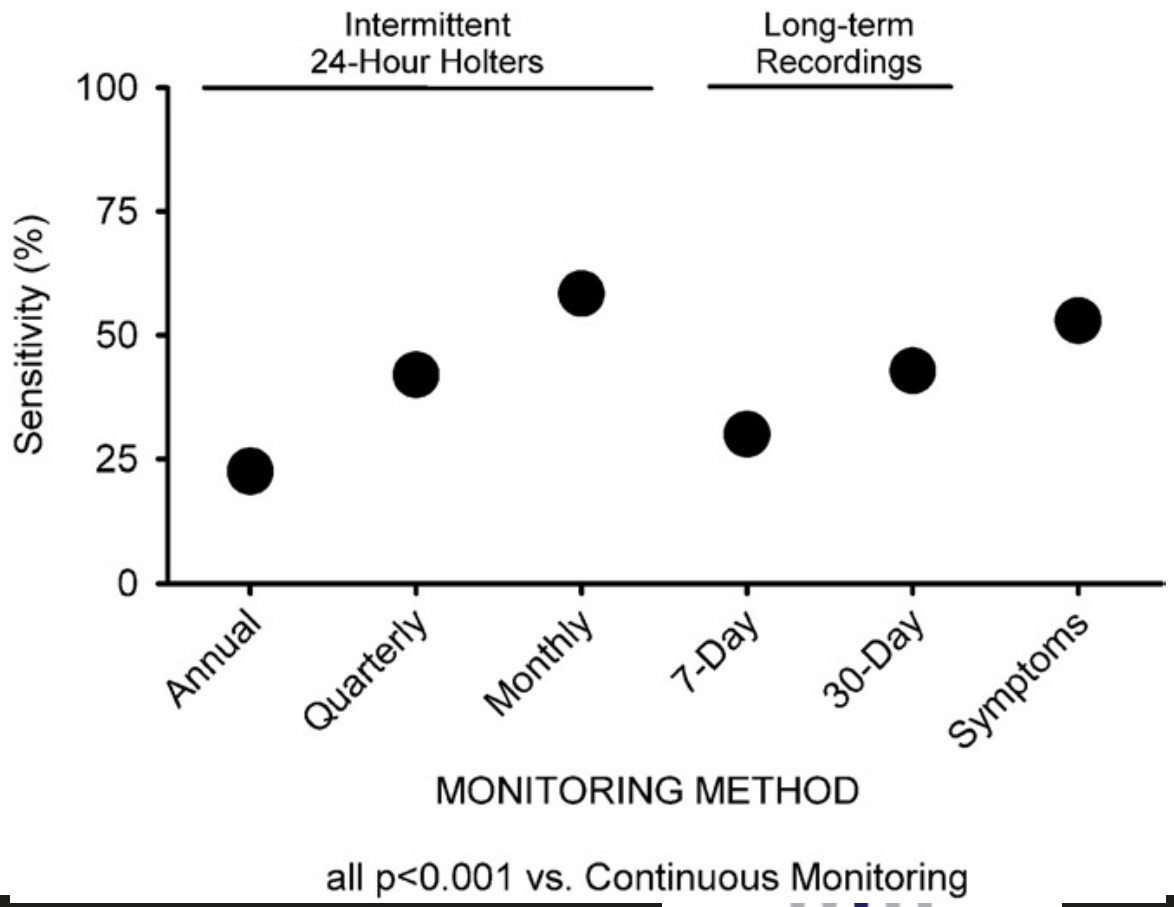
Case 1

- Investigations:
- TFT
- ?Holter
- Echo +/- bubble contrast (unusual to have AF at that age - is there a cause?)
- Treatment
  - No stroke prevention

Case 2

- 76 year old with TIA but not cardiac symptoms
- Investigations?
- Treatment?

Holter monitoring for AF screening



Ziegler et al Heart Rhythm 2006

Case 2

- ECG
- Teach pulse taking and keep pulse diary
- Consider prolonged monitoring or event recorder depending on pulse diary
- If AF proven - anticoagulant

Case 3

- 68 year old man SOB and new onset persistent AF
- Investigations?
- Treatment?

Case 3

- Investigations:
  - Echo when rate controlled
- Treatment
  - Rate control and if still symptomatic:
    - Cardioversion and lifelong antiarrhythmic
    - Catheter ablation

AF ablation the risks

- Pericardial tamponade 1.5%
- Stroke 1:400 (c.f. 1.8% annual CHADS 1)
- Death 1:2500
- More ablation = more risk
- Persistent > PAF

AF ablation

Success defined as freedom from AF off drugs incl. 7 day ECG monitoring

- PAF 1st time success 55 - 85%
- PAF final success 95%
- Persistent AF 1st time success 40%
- Persistent final success 80-85%

Conclusions

- Stroke prevention guided by risk
- Rate control guided by rate and symptoms
- Rhythm control guided by symptoms (or mode of presentation)
- Early treatment impacts outcome

NICE stroke prevention

1. Offer anticoagulants for CHADSVasc >1
2. Consider anticoagulants for men with CHADSVasc = 1
3. Do not offer aspirin
4. Consider aspirin/clopidogrel for CHADSVasc >1 if anticoagulants refused/contraindicated
5. Offer LAA occlusion if anticoagulant contraindicated because of bleeding risk
6. Consider bleeding risk with HASBled score