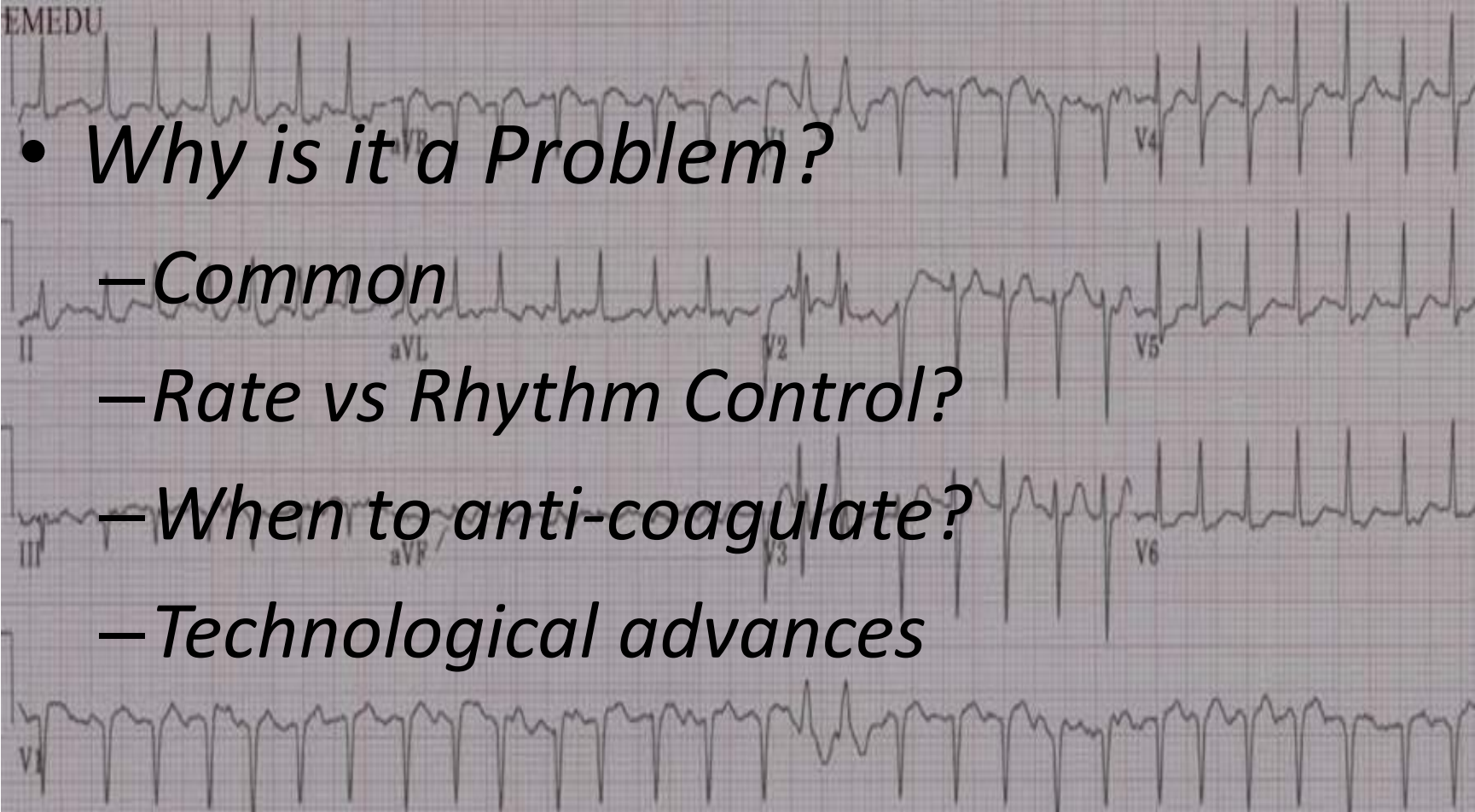


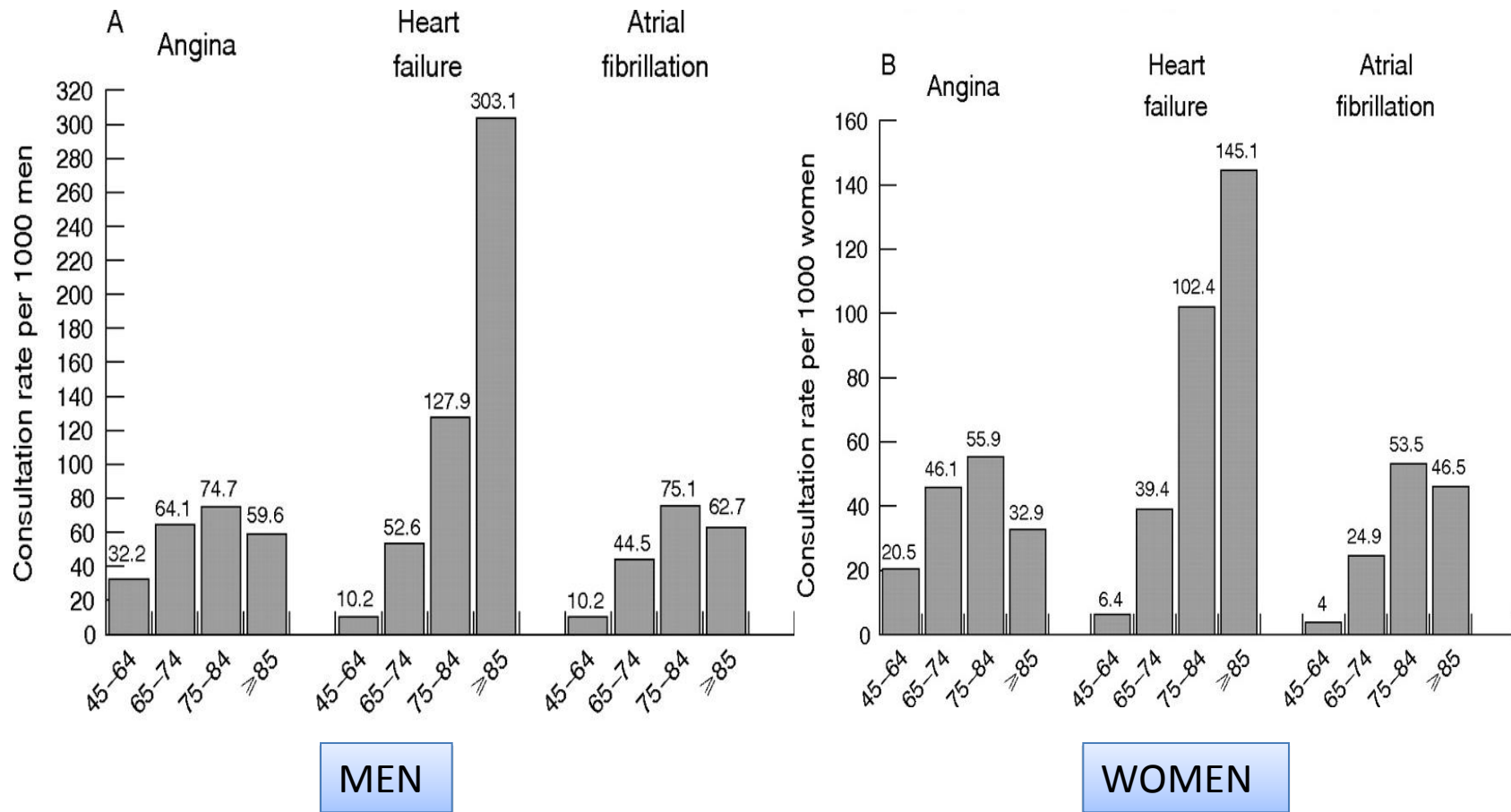
# From Evidence to Practice: Atrial Fibrillation

Dr Chris Davidson  
Brighton & Sussex Medical School

# The Problem of Atrial Fibrillation

- 
- An ECG strip on a grid background. The top left corner has the text 'EMEDU'. The strip shows multiple leads: I, II, III, aVL, aVF, V1, V2, V3, V4, V5, and V6. The rhythm is irregularly irregular, with no discernible P waves, which is characteristic of atrial fibrillation. The QRS complexes are narrow and appear normal in morphology.
- *Why is it a Problem?*
    - *Common*
    - *Rate vs Rhythm Control?*
    - *When to anti-coagulate?*
    - *Technological advances*

# Age-stratified general practitioner consultation rates per 1000 population for heart failure, angina and atrial fibrillation in men (A) and women (B).



Murphy N F et al. Heart 2007;93:606-612

# Case Studies in AF

- Case 1:
  - 50 yr old University Lecturer
  - Hypertension Rx Nifedipine
  - Palpitations lasting 8-12 hours about once/month

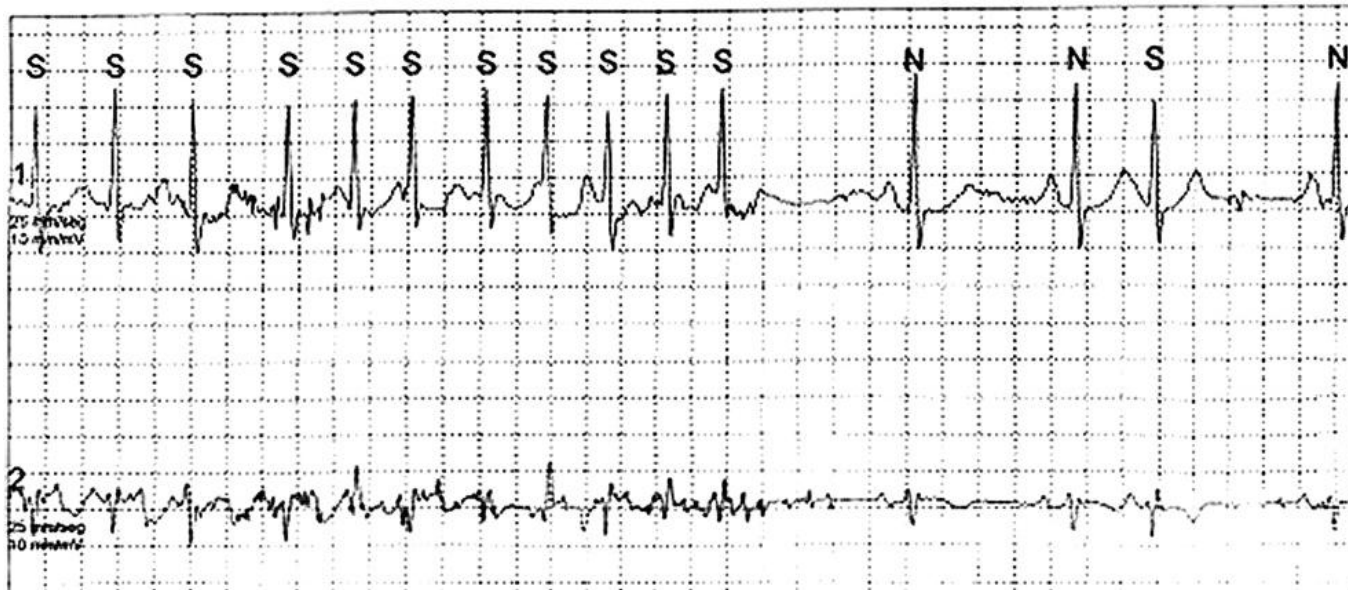
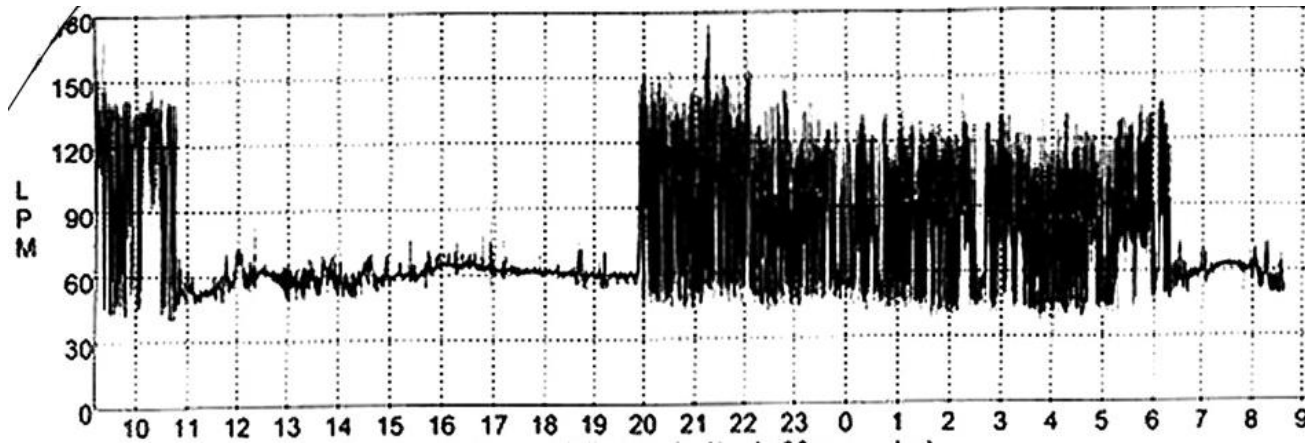


# Case 1: Evaluation



- Clinical Examination:
  - Healthy, but stressed
  - BP 172/96, Cardiac normal, no evidence vascular disease
- Investigations:
  - Normal (routine blood tests, ECG, CXR)
- Current drugs:
  - Nifedipine

# HOLTER Monitor





# Case Studies in AF

*What other information would you seek from the patient at this stage?*

*What further investigations would you carry out?*

*What is your treatment strategy?*



# Case 1: Paroxysmal AF

## Choice of Treatment



*Beta-Blocker or ACE Inhibitor?*

**Either or Both!**



# Case 1: Choice of Treatment

## ACE Inhibitors are Beneficial in PAF



“Overall, ACEIs and ARBs revealed statistically significant preventive effects on AF (odds ratio (OR), 0.65; 95% confidence interval (CI), 0.55-0.76). The preventive effect was similar in the two classes of drugs (ACEI: OR, 0.68; ARB: OR, 0.69).”

*The Role of renin-angiotensin system blockade therapy in the prevention of Atrial Fibrillation: a Meta-Analysis. Zhang, P et al Clin. Pharm. Ther. (2010), 521-31*


# Case 1: Choice of Treatment

## Paroxysmal AF




*Should he receive Warfarin?*

# CHADS-2 Score in AF



RISK FACTOR	SCORE
Cardiac Failure	1
Hypertension	1
Age >75 years	1
Diabetes	1
Stroke / TIA	2



*JAMA 2001;285:2864 – 2870.*

# CHADS<sub>2</sub> Score in AF

**Table 7** CHADS<sub>2</sub> score and stroke rate

CHADS <sub>2</sub> score	Patients (n=1733)	Adjusted stroke rate (%/year) <sup>a</sup> (95% confidence interval)
0	120	1.9 (1.2–3.0)
1	463	2.8 (2.0–3.8)
2	523	4.0 (3.1–5.1)
3	337	5.9 (4.6–7.3)
4	220	8.5 (6.3–11.1)
5	65	12.5 (8.2–17.5)
6	5	18.2 (10.5–27.4)

Adapted from Gage BF  
et al. JAMA 2001;  
285:2864–2870.

ESC recommendation 2010:  
Treat if Score 2 or more

# Case 1: Choice of Treatment

## Intermittent AF



*Is he at lower Risk with  
intermittent AF?*

“Patients with paroxysmal AF should be regarded as having a stroke risk similar to those with persistent or permanent AF, in the presence of risk factors.” *ESC Guideline 2010*

# Case 1: Progress



- Remains Symptomatic on combination:
  - Nifedipine, atenolol, ramipril
  - In spite of good BP control
- What would you do next?
- Referred to cardiologist:
  - Fails to tolerate flecainide
  - Photosensitivity with Amiodarone



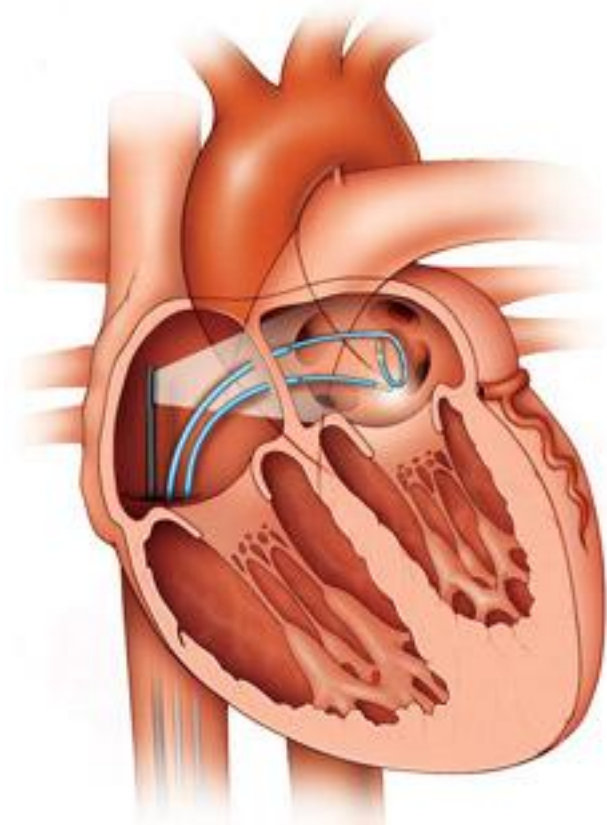
# What's New?



## DRUGS

- **Dronedarone**
  - Amiodarone related
  - Twice daily
  - Contains no Iodine
  - Licensed for AF
  - Contra-indicated in Heart Failure

## TECHNOLOGY

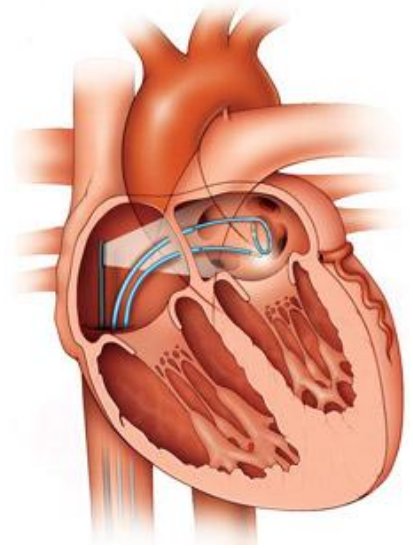


# Radiofrequency Ablation in AF

## Catheter Ablation for Atrial Fibrillation: Are Results Maintained at 5 Years of Follow-Up?

Hopital Cardiologique du Haut-Leveque, Bordeaux-Pessac, France

*JACC* 2011; 57; 160-6



- 100 Patients: 86% male, 64% paroxysmal, mean age 55.7 yrs
- 175 procedures (median 2/patient)
- Complications: Tamponade 3%
- AF free: 87%, 81%, and 63% at 1, 2, and 5 years
- Adverse factors:
  - Persistent AF
  - Valve disease or dilated cardiomyopathy

# Case 1: Take-Home Messages:



- *ACE inhibitors (and Angiotensin receptor blockers) can prevent the development of recurrent AF*
- *Embolic risk in paroxysmal AF is equivalent to permanent AF and depends on the CHADS-2 score*
- *Radio-frequency ablation is now available for those unresponsive to drug treatment but long term benefit uncertain*

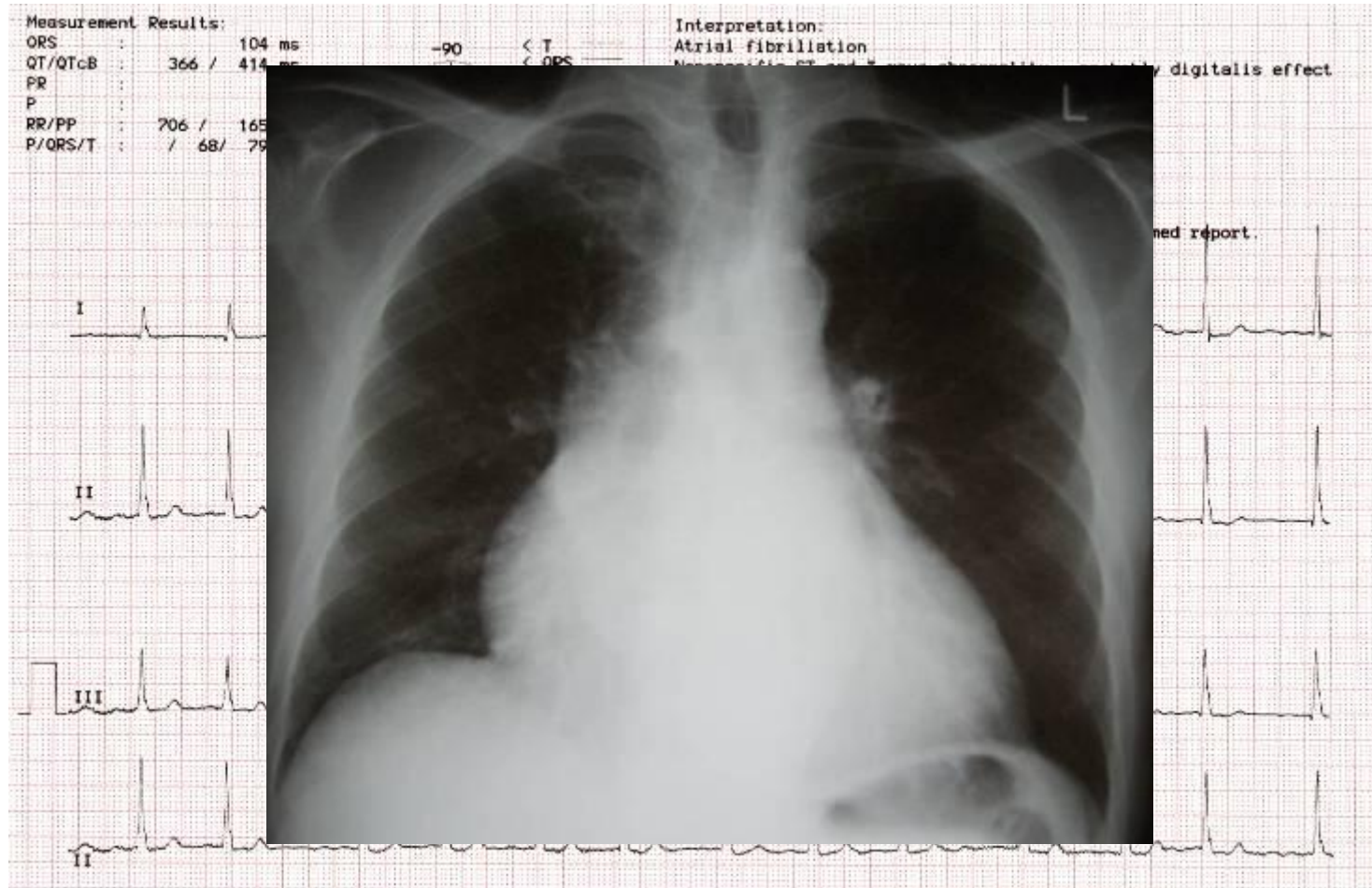
# Atrial Fibrillation: Case 2

- Male smoker, 69 years with HT
- Rx Atenolol + thiazide
- AF found on routine examination
- Mild dyspnoea only
- Examination:
  - No heart failure
  - No murmurs



What proportion of patients with AF are asymptomatic?

# Atrial Fibrillation: Case 2



# Atrial Fibrillation: Case 2

## Hypertensive Heart Disease



- Should sinus rhythm be restored:
  - By Electrical cardioversion?
  - OR drugs eg Amiodarone?
  - OR a combination of these?

### *Rhythm-control vs. Rate-control controversy*

“The AFFIRM, RACE, the Pharmacologic Intervention in Atrial Fibrillation (PIAF) trial, and the Strategies of Treatment of Atrial Fibrillation (STAF) trial found no differences in quality of life with rhythm control compared with rate control.” *ESC AF Guideline 2010*




# Atrial Fibrillation: Case 2

Hypertensive Heart Disease




*Should he be started on long-term anti-coagulants?*

# CHADS-2 Score in AF



RISK FACTOR	SCORE
<b>C</b> ardiac Failure	1
<b>H</b> ypertension	1
<b>A</b> ge >75 years	1
<b>D</b> iabetes	1
<b>S</b> troke / TIA	2



*JAMA 2001;285:2864 – 2870.*

# Atrial Fibrillation: Case 2

## Hypertensive Heart Disease



- *Should he be started on long-term anti-coagulants?*
  - *CHADS-2 score = 1*
  - *2.4 % per annum stroke risk (2.0-3.8)*

What are the problems with the CHADS-2 Score?

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

## Major Risk Factors

- Prior Stroke / TIA
- Prior Systemic Embolus
- Age > 75 years
- Valvular disease (rheumatic, prosthetic)

## Minor Risk Factors

- Heart Failure or LV dysfunction
- Hypertension
- Diabetes
- Age > 65 years
- Vascular Disease
- Female sex

Lip GY, Nieuwlaat R, Pisters R, Lane DA, Crijns HJ. Refining clinical risk stratification for predicting stroke and thromboembolism in atrial fibrillation using a novel risk factor-based approach: the Euro Heart Survey on atrial fibrillation. *Chest* 2010;137:263 – 272.

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

**(b) Risk factor-based approach expressed as a point based scoring system, with the acronym CHA<sub>2</sub>DS<sub>2</sub>-VASc**  
 (Note: maximum score is 9 since age may contribute 0, 1, or 2 points)

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

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

(c) Adjusted stroke rate according to CHA<sub>2</sub>DS<sub>2</sub>-VASc score

CHA <sub>2</sub> DS <sub>2</sub> -VASc score	Patients (n = 7329)	Adjusted stroke rate (%/year) <sup>b</sup>
0	1	0%
1	422	1.3%
2	1230	2.2%
3	1730	3.2%
4	1718	4.0%
5	1159	6.7%
6	679	9.8%
7	294	9.6%
8	82	6.7%
9	14	15.2%

ESC recommendation 2010:  
Treat if Score 2 or more



# Atrial Fibrillation: Case 2

## Hypertensive Heart Disease



- *Should he be started on long-term anti-coagulants?*
  - *CHA<sub>2</sub>DS<sub>2</sub>-VASc score = 2*
  - *2.2 % per annum stroke risk*

*BUT you note that he has been a heavy smoker –  
does that change his risk?*

# Atrial Fibrillation: Case 2

- Male smoker, 69 years with HT
- Re-Examination
  - ? Abdominal bruit
  - Peripheral pulses: dorsalis pedis absent bilaterally

*What further test would help?*



# Peripheral Vascular disease: A growing problem for the internist

EFIM Vascular Medicine Working Group  
Eur. J Int Med 2009; 20; 130-8

- PVD present in 16% over age 55 yrs
- Readily identified by **A**nkle-**B**rachial **I**ndex
- Significant additional Risk factor for vascular events

Patient: ABI = 0.86



# Atrial Fibrillation: Case 2

## Hypertensive Heart Disease



- *Should he be started on long-term anti-coagulants?*
  - *CHA<sub>2</sub>DS<sub>2</sub>-VASc score = 3*
  - *3.2 % per annum stroke risk*
  - *Risk of Significant haemorrhage on warfarin = 1-2% per annum*

5 years ago had gastric haemorrhage requiring hospitalisation

# Atrial Fibrillation: Case 2

## Hypertensive Heart Disease



*What further information would you like to know to decide whether to prescribe him warfarin or aspirin or neither?*

# Bleeding Risk in AF Population

Chest November 1, 2010 138:1032-1033;

## Bleeding Risk – HAS-BLED Score

Letter	Clinical characteristic <sup>a</sup>	Points awarded
H	Hypertension	1
A	Abnormal renal and liver function (1 point each)	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INRs	1
E	Elderly (e.g. age >65 years)	1
D	Drugs or alcohol (1 point each)	1 or 2
		Maximum 9 points

[www.escardio.org](http://www.escardio.org)



Overall bleeding rate low (1.5% per year) and Score <3 represents ‘low-risk’

# Comparative Validation of a Novel Risk Score for Predicting Bleeding Risk in Anticoagulated Patients With Atrial Fibrillation: the HAS-BLED (Hypertension, Abnormal Renal/Liver Function, Stroke, Bleeding History or Predisposition, Labile INR, Elderly, Drugs/Alcohol Concomitantly) Score

*Gregory Y.H. Lip, MD, Lars Frison, PhD, Jonathan L. Halperin, MD and Deirdre A. Lane, PhD*

J Am Coll Cardiol, 2011; 57:173-180

*Applied HAS-BLED and other Scores to 7329 patients from the SPORTIF III and IV trials*

**Conclusions:** This analysis identifies diabetes and heart failure or left ventricular dysfunction as potential risk factors for bleeding in AF beyond those previously recognized. Of the contemporary bleeding risk stratification schemas, the new HAS-BLED scheme offers useful predictive capacity for bleeding over previously published schemas and may be simpler to apply.

# What's New in Atrial Fibrillation?

## Problems with Warfarin

- Poor control of INR
- Inconvenience for patients
- Medical resources for testing and follow-up
- Drug interactions

## New Anti-Thrombins

- DABIGATRAN
  - No testing required
  - Few drug interactions
  - Efficacy equivalent to warfarin

Currently licenced in some countries for prevention of venous thrombosis and prophylaxis in AF (FDA Oct 2010)



# The NEW ENGLAND JOURNAL of MEDICINE

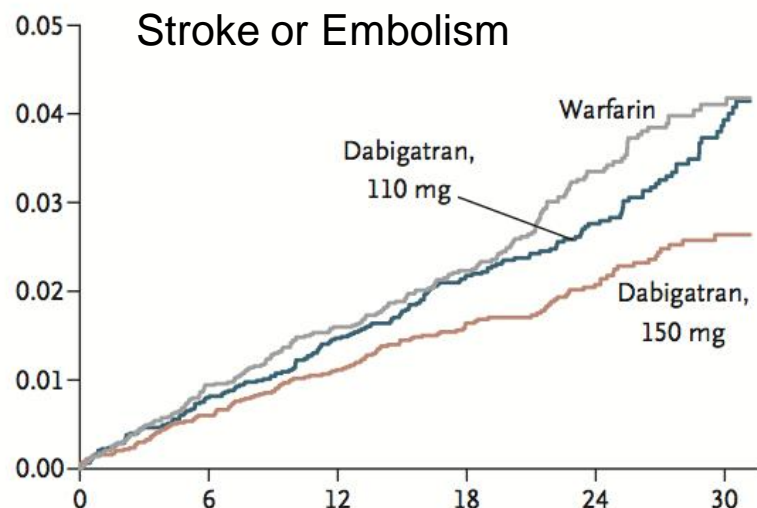
ESTABLISHED IN 1812

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## Dabigatran versus Warfarin in Patients with Atrial Fibrillation

Stuart J. Connolly, M.D., Michael D. Ezekowitz, M.B., Ch.B., D.Phil., Salim Yusuf, F.R.C.P.C., D.Phil., John Eikelboom, M.D., Jonas Oldgren, M.D., Ph.D., Amit Parekh, M.D., Janice Pogue, M.Sc., Paul A. Reilly, Ph.D., Ellison Themeles, B.A., Jeanne Varrone, M.D., Susan Wang, Ph.D., Marco Alings, M.D., Ph.D., Denis Xavier, M.D., Jun Zhu, M.D., Rafael Diaz, M.D., Basil S. Lewis, M.D., Harald Darius, M.D., Hans-Christoph Diener, M.D., Ph.D., Campbell D. Joyner, M.D., Lars Wallentin, M.D., Ph.D., and the RE-LY Steering Committee and Investigators\*



Non-Inferiority to Warfarin:

No significant difference in mortality, major bleeding or primary outcome

BUT apparent increase in MI:  
RR 1.38 (150mg)

# Atrial Fibrillation:

## Take Home Messages

- *Most patients require effective Rate-Control rather than multiple cardioversion*
- *Most patients need long-term warfarin*
- *New Risk scores( $CHA_2DS_2$ -VASc and HAS-BLED) enable more informed decision making*
- *New drugs may revolutionise our approach to prophylactic anti-coagulation*

# REFERENCE:

## Guidelines for the Management of Atrial Fibrillation

*Task Force for the Management of AF of the European Society of Cardiology*

Eur. Heart J 2010: 31;2369-2429

*Contains 200 contemporary references*