Atrial Fibrillation

Suzanne Walsh
Stroke Nurse Specialist

Atrial fibrillation overview – definition

- AF is the most common sustained heart rhythm condition (arrythmia). Abnormal electrical impulses firing in the atria override hearts natural pacemaker(sinus node)
- Atria contract fast and irregularly so the heart muscle cannot relax properly – leading to blood pooling and risk of clot formation .

Mechanism

- Normally the heart contracts and relaxes in a regular beat.
- Cells in the heart make electric signals that cause the heart to contract and pump blood around the body.
- These electrical signals are shown upon an Electrocardiogram.
- In Atrial Fibrillation the two small upper chambers of the heart (Atria) do not beat in a regular fashion and instead beat irregularly and too fast(quivering) instead of in a strong filling and emptying regular pattern.

Atrial fibrillation Prevalence

- 1-2% prevalence in general population (generally accepted as underestimated – asymptomatic cases up to 20%)
- 1.4% greater risk in men v women
- 25% lifetime risk in those who reach 40 yrs (1 in 4)
- Incidence expected to increase in next few decades as population ages . 2.3% over 40 yrs 5.9% over 65yrs ,11-14% over 75 yrs **.Feinberg et al 1995**

AF – related stroke is associated with significant mortality and morbidity.

Mortality

- AF increases risk of Stroke by approx . 5 fold compared to risk of stroke in patients with no AF.(Wolf et al 1991)

Morbidity

- Strokes due to AF are associated with an increased risk of death (30- day mortality rate 33% vs 16% Non AF strokes .
- 1 yr mortality rate 50% vs 27% for patients with no AF.(Marini et al 2005)

Possible causes Atrial Fibrillation

- High blood pressure.
- Heart attack.
- Coronary artery disease.
- Abnormal heart valves.
- Heart defects you're born with (congenital)
- An overactive thyroid gland or other metabolic imbalance.
- Exposure to stimulants, such as medications, caffeine, tobacco or alcohol

Atrial Fibrillation

- Etiology: due to multiple re-entrant wavelets conducted between the R & L atria and the impulses are formed in a totally unpredictable fashion.
- The AV node allows some of the impulses to pass through at variable intervals (so rhythm is irregularly irregular).

Signs and Symptoms

- Irregular and often rapid heartbeat
- Heart palpitations or rapid thumping inside the chest
- Dizziness ,sweating and chest pain or pressure
- Shortness of breath or anxiety
- Fatigue particularly on exertion
- Feeling lightheaded, dizzy, or like you might pass out or faint

Atrial fibrillation may be:

- **Occasional.** In this case it's called paroxysmal atrial fibrillation. You may have symptoms that come and go, lasting for a few minutes to hours and then stopping on their own.
- **Persistent.** With this type of atrial fibrillation, your heart rhythm doesn't go back to normal on its own. If you have persistent atrial fibrillation, you'll need treatment such as an electrical shock or medications in order to restore your heart rhythm.
- **Long-standing persistent.** This type of atrial fibrillation is continuous and lasts longer than 12 months.
- **Permanent.** In this type of atrial fibrillation, the abnormal heart rhythm can't be restored. You'll have atrial fibrillation permanently, and you'll often require medications to control your heart rate

Problems

- Risk of clots due to pooling of blood in the Atria (Stroke)
- Heart rate control as can be fast at times
- Risk of heart failure due to heart not pumping the blood around the body as efficiently as it should.
- Chronic fatigue
- Additional heart rhythm problems

Diagnostic Tests and Evaluation

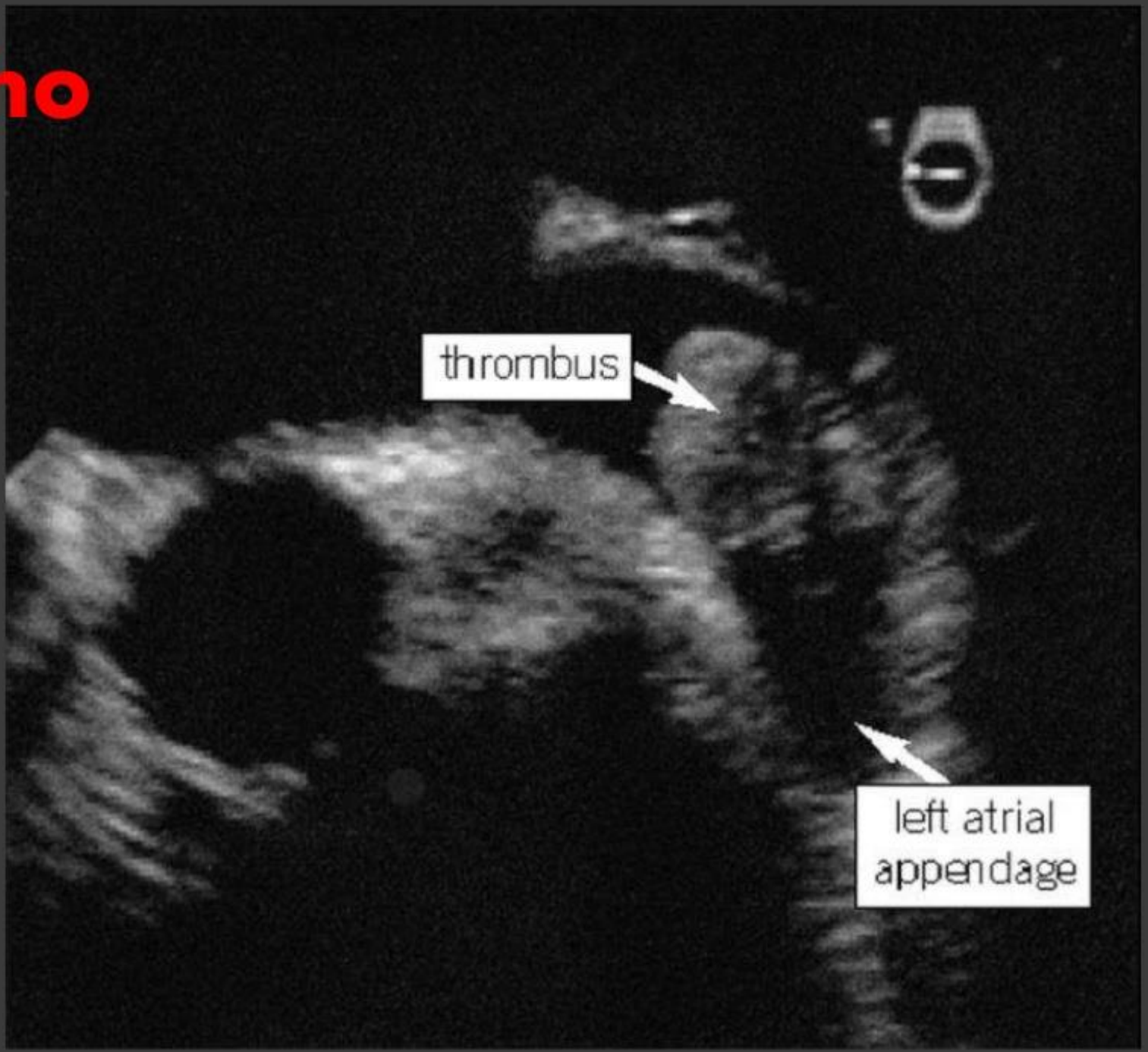
- ECG
- Cardiac monitoring
- R –test/ Holter monitoring
- Implantable loop recorder
- CXR
- ECHO
- Blood tests including thyroid
- Stress test

Holter monitoring

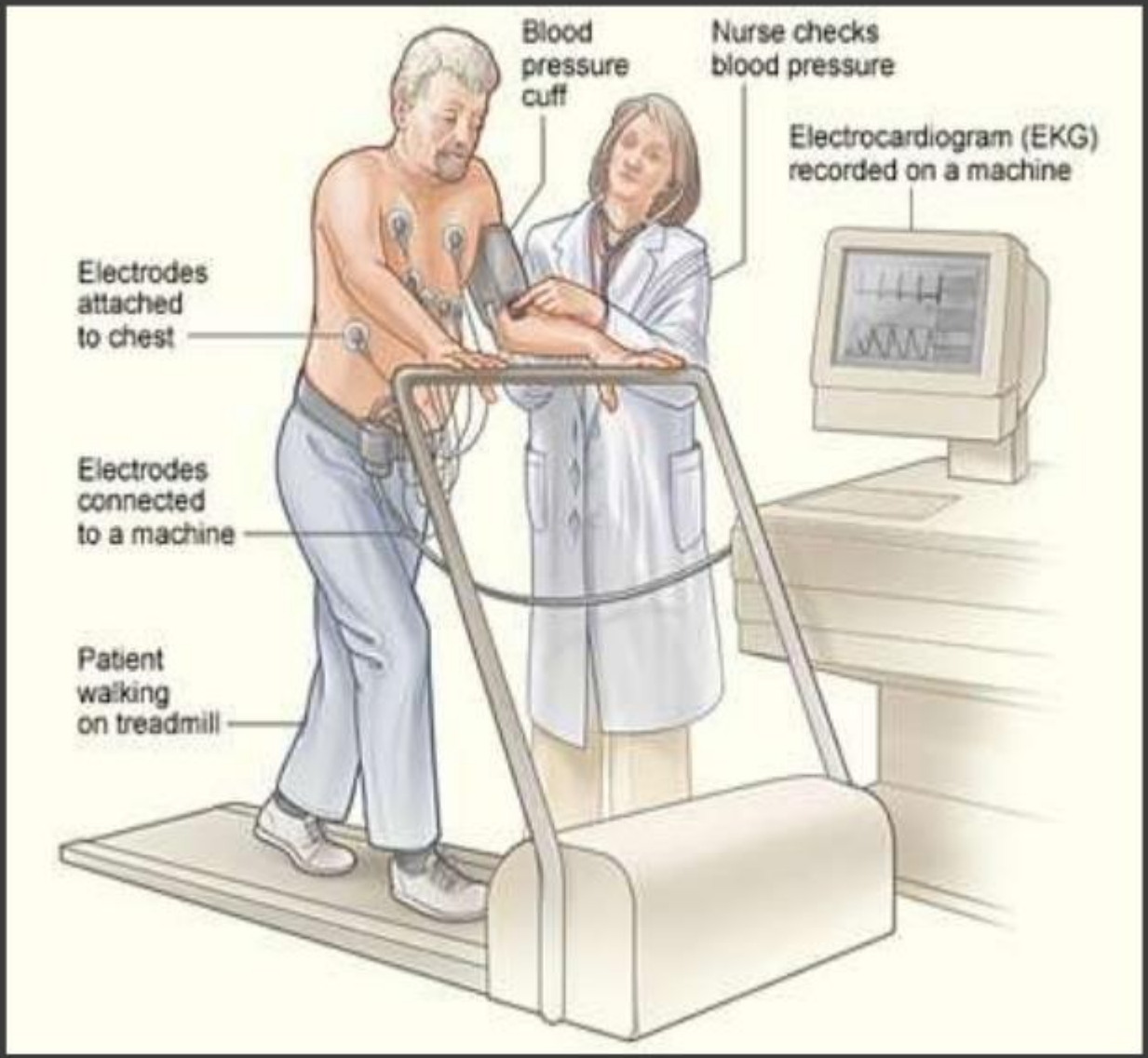
Electrocardiogram (ECG)

Holter monitoring

Echo



Stress test


Blood pressure cuff
Nurse checks blood pressure
Electrocardiogram (EKG) recorded on a machine
Electrodes attached to chest
Electrodes connected to a machine
Patient walking on treadmill

Treatment Options

- Medicines to control the speed or rhythm of the heartbeat
- Medicines to keep clots from forming
- A treatment called "cardioversion" that involves applying a mild electrical current to the heart to fix its rhythm
- Treatments called "ablation," which use heat ("radiofrequency ablation") or cold ("cryoablation") to destroy the small part of the heart that is sending abnormal electrical signals
- A device called a pacemaker that is implanted in your body and sends electrical signals to the heart to control the heartbeat

Strategies for treating Atrialfibrillation

- Rhythm control (including cardioversion)

  OR

- Rate control

  PLUS

- **Thromboembolic risk prevention:**

  based on CHA_2DS_2-VAS_2C score

Common drugs for rate/rhythm control

- Antiarrythmic drugs – eg amioderone, flecanide, propafonone , sotolol
- rate control eg betablockers or digoxin or amioderone , certain calcium channel blockers such as diltiazem and verapramil
- Side effects hypotension , collapse , bradycardia , worsening cardiac arrythmia , shortness of breath ,
- confusion , hallucinations ,Visual changes , fatigue , seizures- Digoxin levels

Thrombo-embolic Risk and Treatment Risk Based Antithrombotic Therapy

- CHA_2DS_2-VASc score recommended to assess stroke risk (Class I)

Table 2—*The 2009 Birmingham Schema Expressed as a Point-Based Scoring System, With the Acronym CHA_2DS_2-VASc*

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

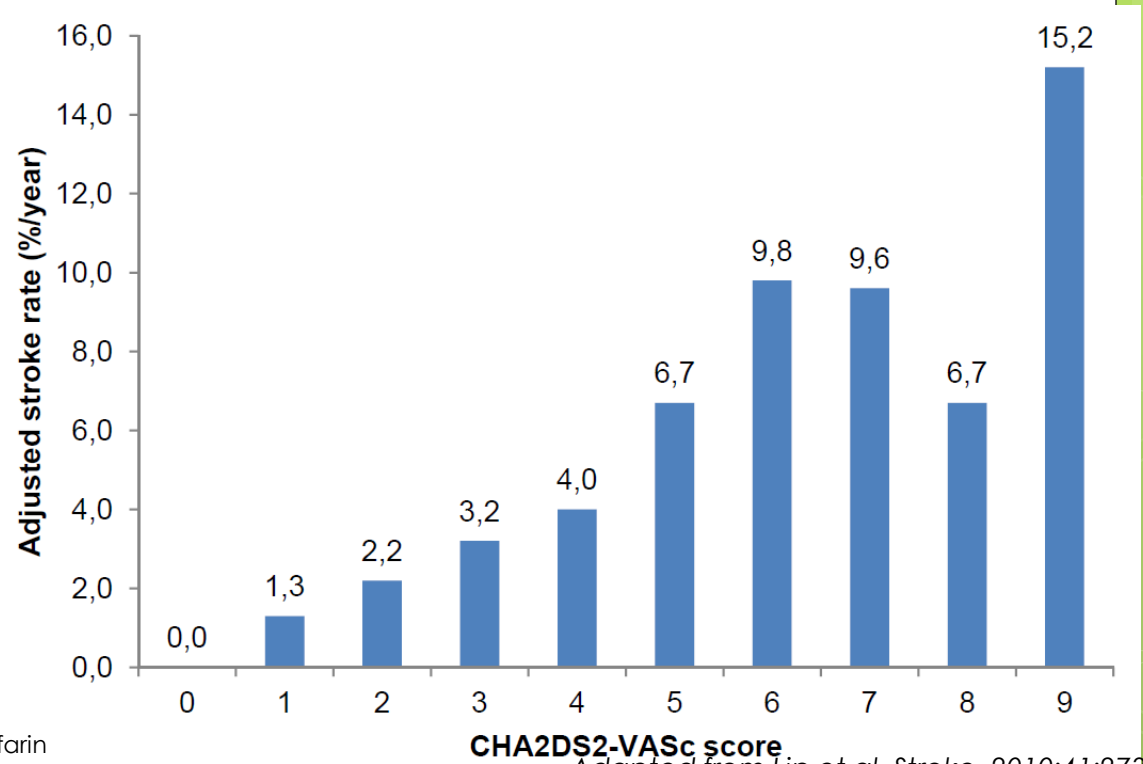
Stroke Rate in AF Patients According to CHA_2DS_2-VASc Score

CHA_2DS_2VASc – a comprehensive score to assess stroke risk and guide use of anticoagulant treatment (≥1) – recommended in the 2012 ESC guidelines[1]

Adapted from Lip et al. Stroke. 2010;41:2731-2738[3]

CHA_2DS_2-VASc Score	*Adjusted Stroke Rate (%/year)
0	0
1	1.3
2	2.2
3	3.2
4	4.0
5	6.7
6	9.8
7	9.6
8	6.7
9	15.2

*Theoretical TE rates without therapy: assuming that warfarin provides a 64% reduction in TE risk, based on Hart et al[2]



Adapted from Lip et al. Stroke. 2010;41:2731-2738[3]

ESC, European Society of Cardiology;CHA_2DS_2-VASc, Congestive heart failure, Hypertension, Age ≥75 (doubled), Diabetes, Stroke (doubled), Vascular disease, Age 65–74, and Sex category (female);

1. ESC 2012 Guidelines: Camm et al 2012 focused update of the ESC Guidelines for the management of atrial fibrillation, European Heart Journal (2012) 33, 2719–2747
2. Hart RG, Pearce LA, Aguilar MI. Meta-analysis: antithrombotic therapy to prevent stroke in patients who have nonvalvular atrial fibrillation. *Ann Intern Med.* 2007;146:857– 867. 3 Lip et al **Identifying Patients at High Risk for Stroke Despite Anticoagulation *Stroke*. 2010;41:2731-2738**

HAS-BLED

Letter	Clinical Characteristic	Points
H	Hypertension	1
A	Abnormal Liver or Renal Function	1 or 2
S	Stroke	1
B	Bleeding	1
L	Labile INR	1
E	Elderly (age > 65)	1
D	Drugs or Alcohol	1 or 2
Maximum Score		9

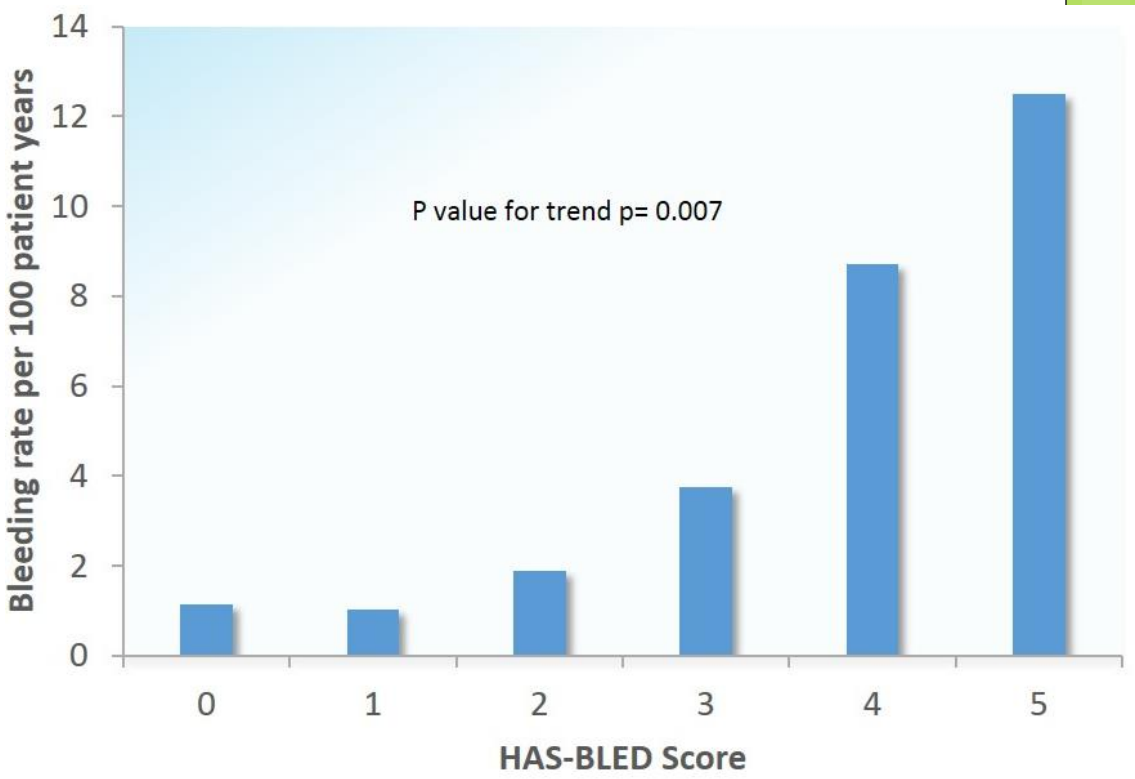
- Scores 0-2 low risk bleeding, ≥3 associated w/ high bleeding risk
- 1 point awarded for each of the abnormal renal or liver function and drugs or alcohol

Bleeding Rate in AF Patients According to HAS-BLED Score

Clinical Characteristics Composing the HAS-BLED Bleeding Risk Score

HAS-BLED Score	Bleeds per 100 patient years
0	1.13
1	1.02
2	1.88
3	3.74
4	8.70
5	12.50
Any Score	1.56

1 year risk of major bleeding increases with HAS-BLED Score in Patients With AF - from Euro Heart Survey (n = 3,978)



Adapted from Pisters et al; A Novel User-Friendly Score (HAS-BLED) o Assess 1-Year Risk of Major Bleeding in Patients With Atrial Fibrillation: The Euro Heart Surve; CHEST / 138 / 5 / NOVEMBER, 2010

HAS-BLED, Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile INR, Elderly (>65), Drugs/alcohol concomitantly; SBP, systolic blood pressure; INR, International Normalised Ratio; NSAID, non-steroidal anti-inflammatory drug

Antithrombotic Options

- Antiplatelet agents
- Vitamin K antagonists (warfarin)
- Direct oral anticoagulation

Aspirin +/- Clopidogrel

- Aspirin monotherapy not supported by evidence
  - No benefit in preventing stroke except in one study (SPAF-1 trial)
- Aspirin plus clopidogrel may be a reasonable alternative in the patient who cannot be treated with anticoagulation
  - Small non-significant benefit to combination therapy as opposed to aspiring monotherapy*
  - Aspirin + clopidogrel inferior to warfarin (ACTIVE-W trial)

Warfarin

Preferred for patients with:

- Mechanical heart valves
- Valvular afib: mitral stenosis or mitral valve replacement
- Breastfeeding
- End stage renal disease

Direct Oral Anticoagulation (DOAC) Examples

- **Direct thrombin inhibitor**
  - Dabigatran (Pradaxa)
- **Direct factor Xa inhibitor**
  - Rivaroxaban (Xarelto)
  - **Apixaban (Eliquis)**
  - Edoxaban (Lixiana)

Need for follow up bloods fbc, rp , liver .plus weight and symptom review

What can I do to reduce my risk?

- Controlling your blood pressure
- Not drinking a lot of alcohol in one sitting (limit to 1 to 2 drinks in one day)
- Cutting down on caffeine
- Getting treatment for an overactive thyroid gland
- Getting regular exercise
- Losing weight (if you are overweight)