Heart Health

Common Cardiac Dysrhythmias and Seeking Medical Care

Goals

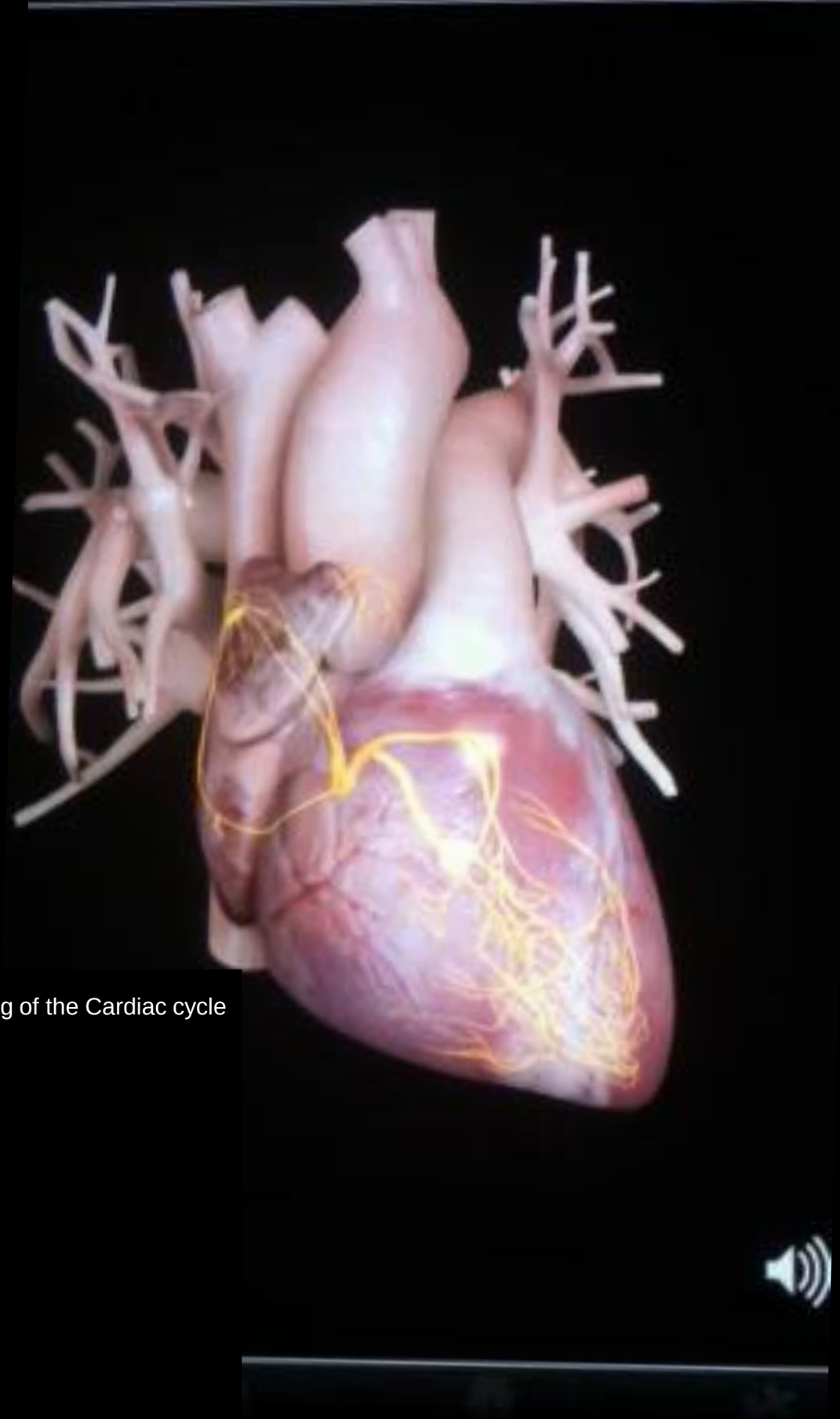
- Define Cardiac Dysrhythmia
- Main Dysrhythmias
- Devices for confirming dysrhythmia
- Atrial Fibrillation
  - Prevalence
  - Importance
  - Management
  - Prevention

Cardiac Dysrhythmia

Abnormal, disordered, or disturbed rhythm.

Taber’s Medical Dictionary

Dictionary

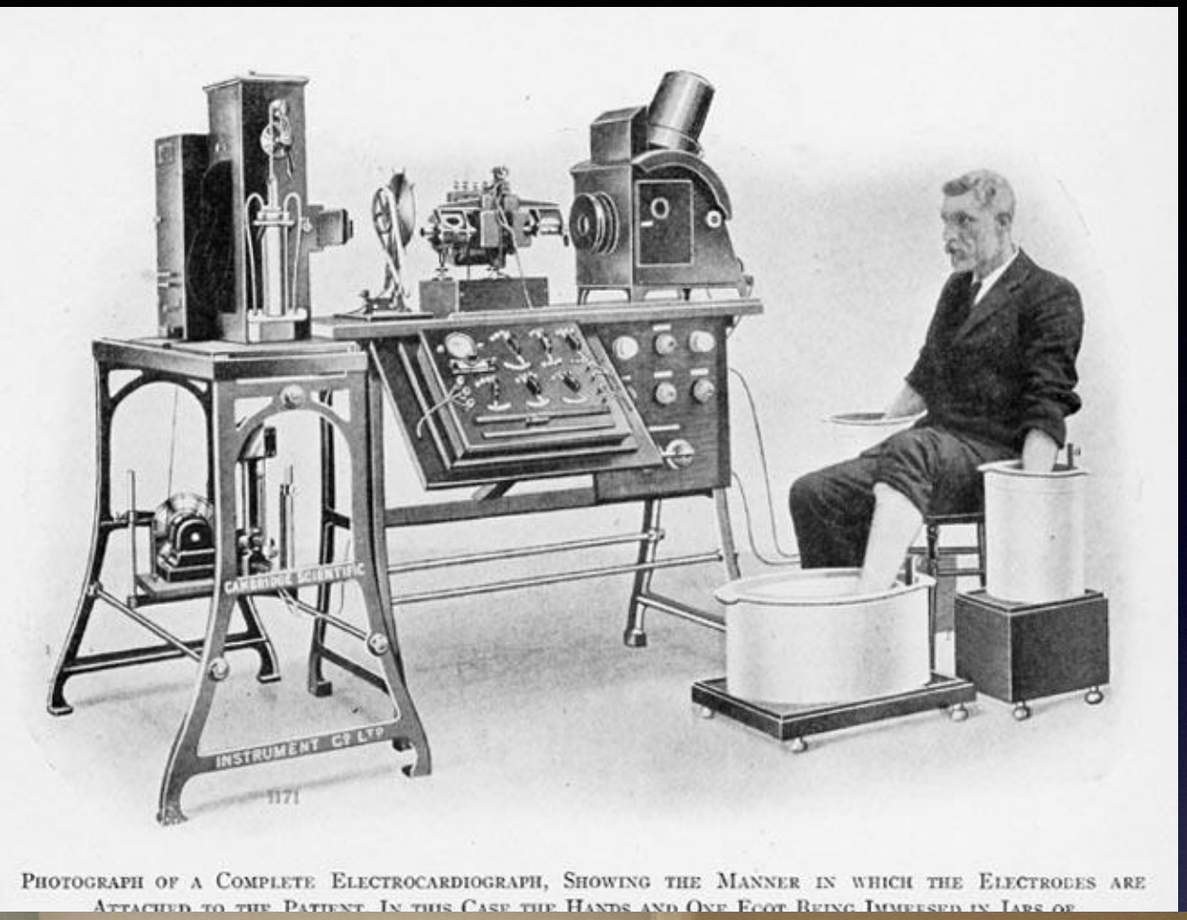


Graphical Recording of the Cardiac cycle

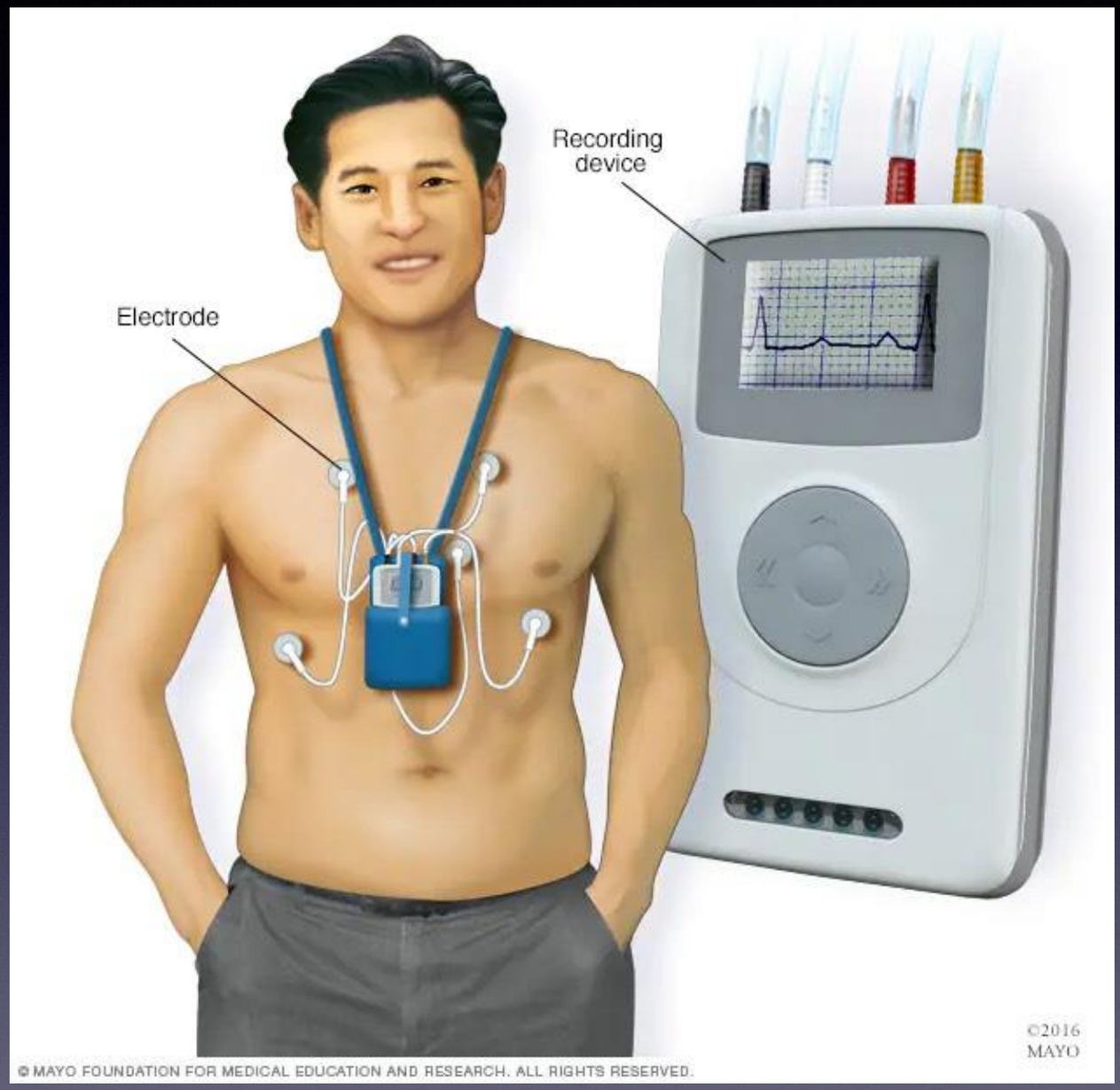
The Main Types of ARRHYTHMIA (DYSRHYTHMIA)

- **ATRIAL FIBRILLATION** – this is the most common type, where the heart beats irregularly irregular and usually faster than normal
- **SUPRA-VENTRICULAR TACHYCARDIA** – episodes of abnormally fast heart rate at rest
- **BRADYCARDIA** – the heart beats more slowly than normal
- **HEART BLOCK**– the heart beats more slowly than normal and can cause people to collapse
- **VENTRICULAR FIBRILLATION** – a rare, rapid and disorganized rhythm of heartbeats that rapidly leads to loss of consciousness and sudden death if not treated immediately

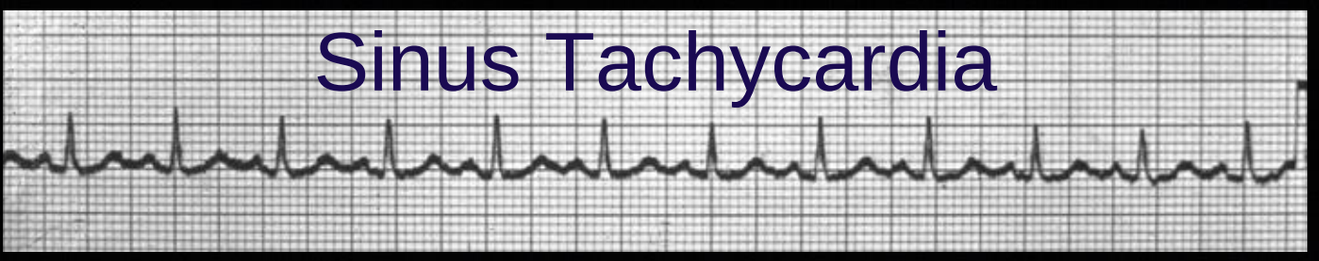
Recording Devices



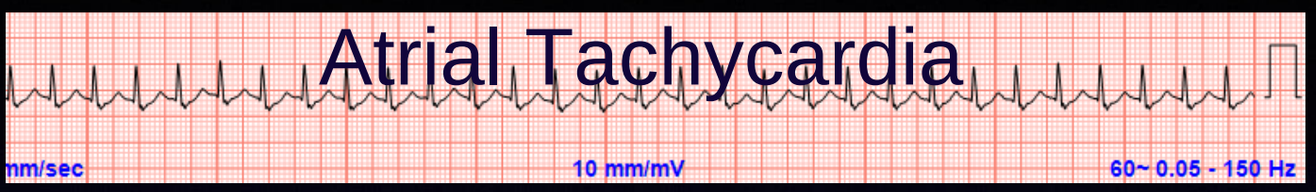
Photograph of a Complete Electrocardiograph, Showing the Manner in which the Electrodes are Attached to the Patient. In this Case the Hands and One Foot Being Immersed in Jars of



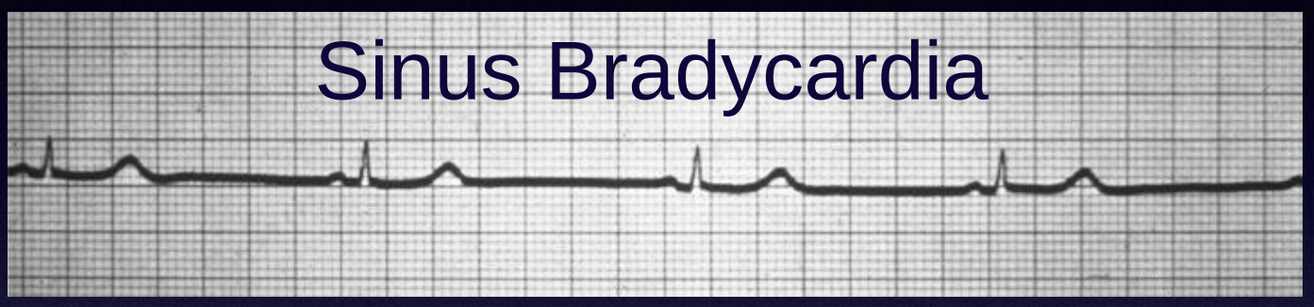
Sinus Tachycardia



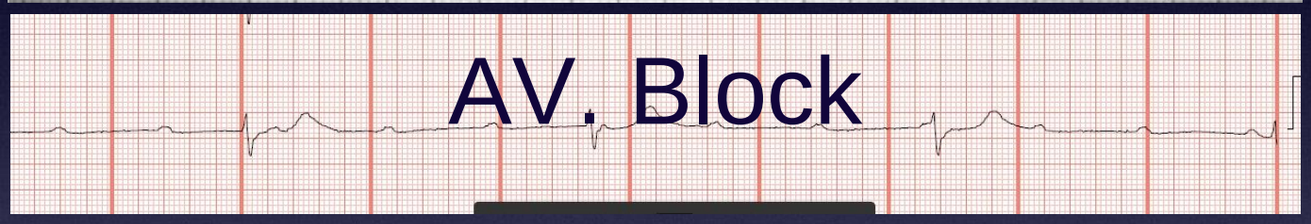
Atrial Tachycardia



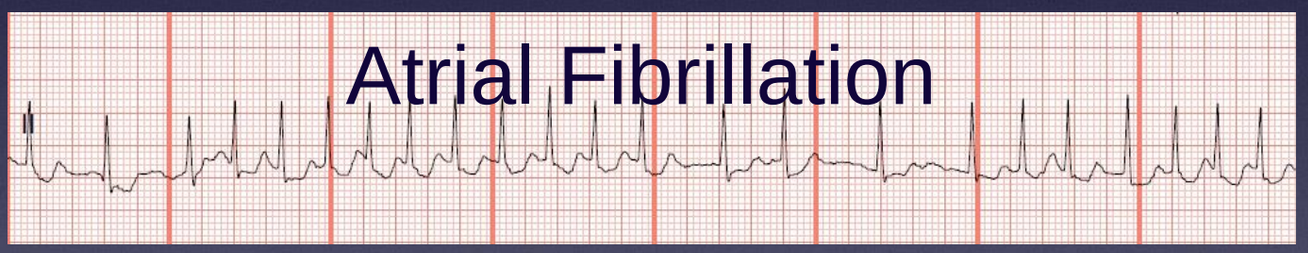
Sinus Bradycardia



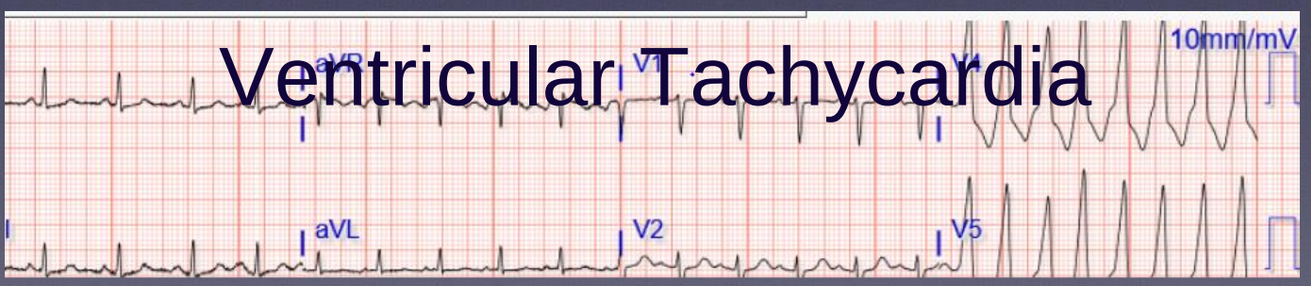
AV. Block



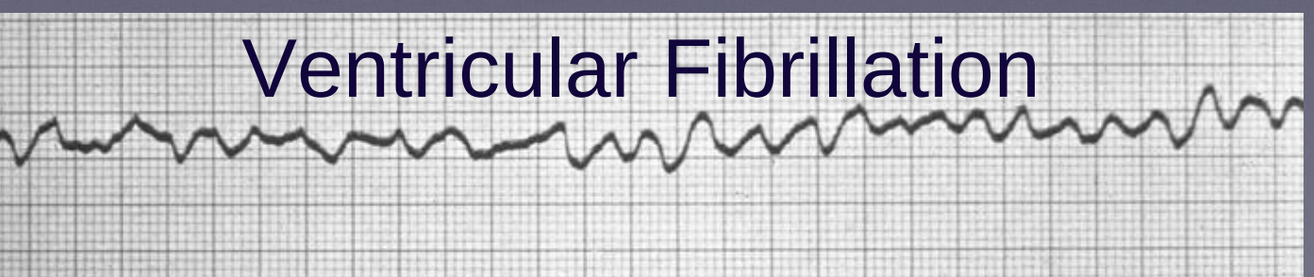
Atrial Fibrillation

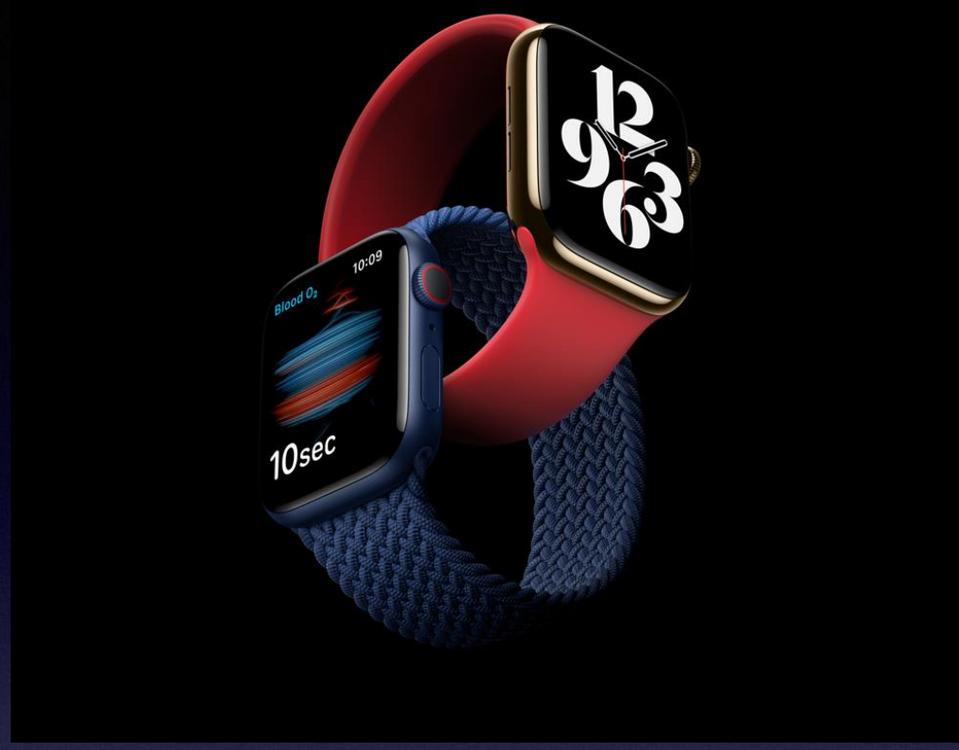


Ventricular Tachycardia

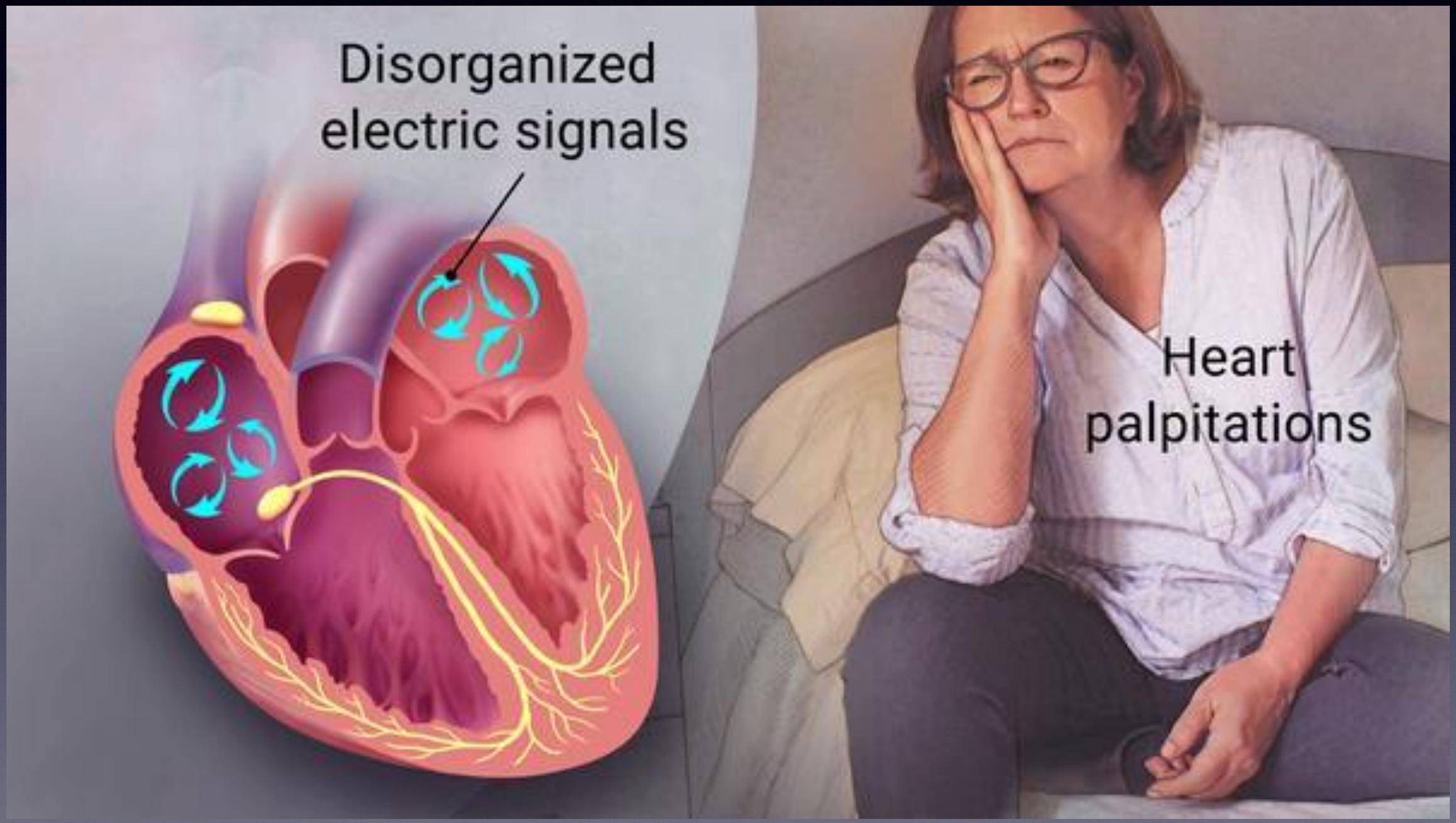


Ventricular Fibrillation





SYMPTOMS ?



Symptoms of Cardiac Dysrhythmias

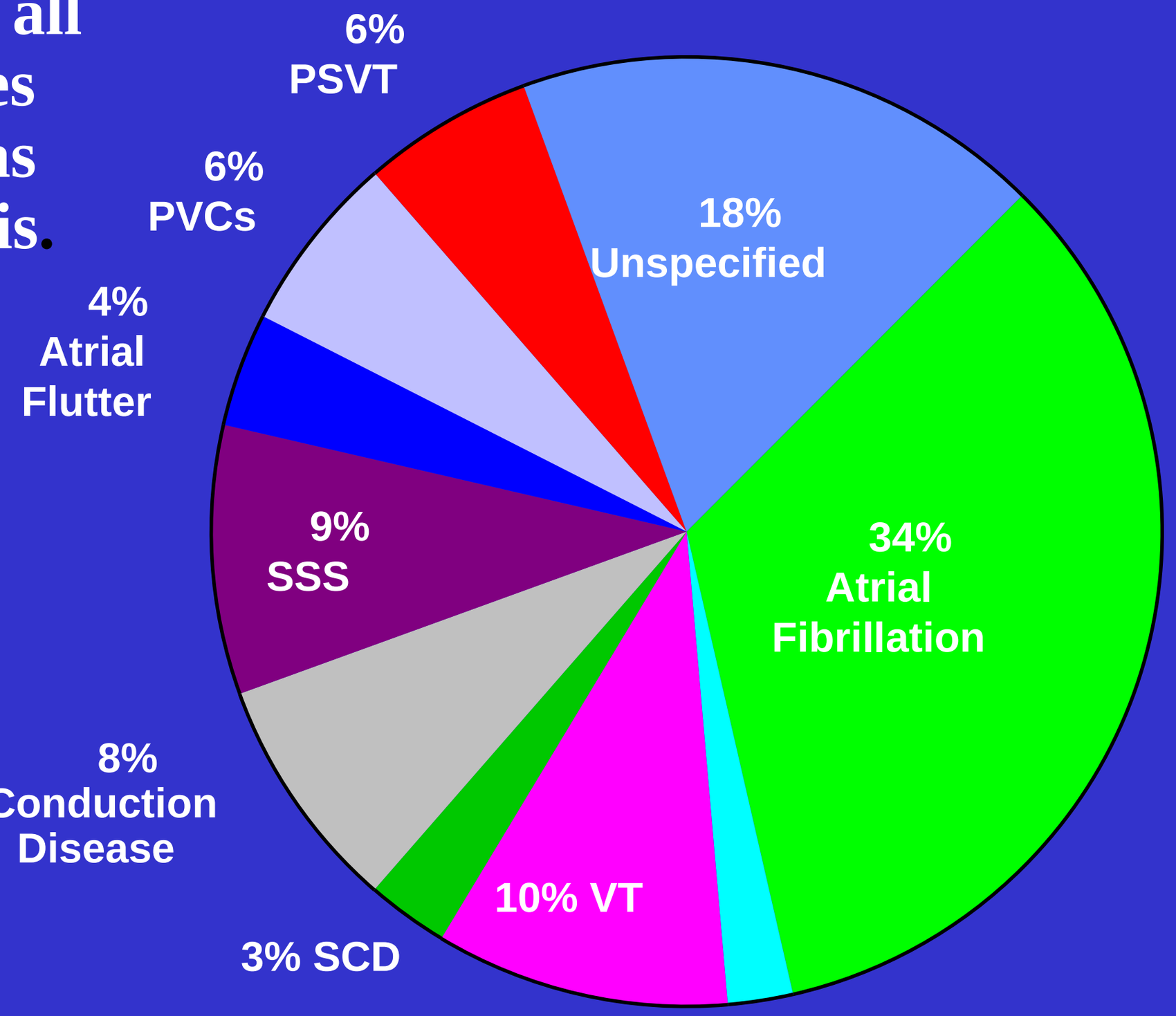
- No Symptoms (Asymptomatic)
- Weakness or Feeling Extremely Tired
- A Pounding Sensation in the Chest
- A Feeling of a Skipped or Extra Heartbeat (Palpitation)
- Chest Pain
- Lightheadedness
- Shortness of Breath
- Fainting
- Labored Breathing

If Persistent - See a Healthcare Provider

When to Seek Emergency Care

- Chest Pain
- Lightheadedness
- Shortness of Breath

Atrial fibrillation accounts for 1/3 of all patient discharges with *arrhythmia* as principal diagnosis.



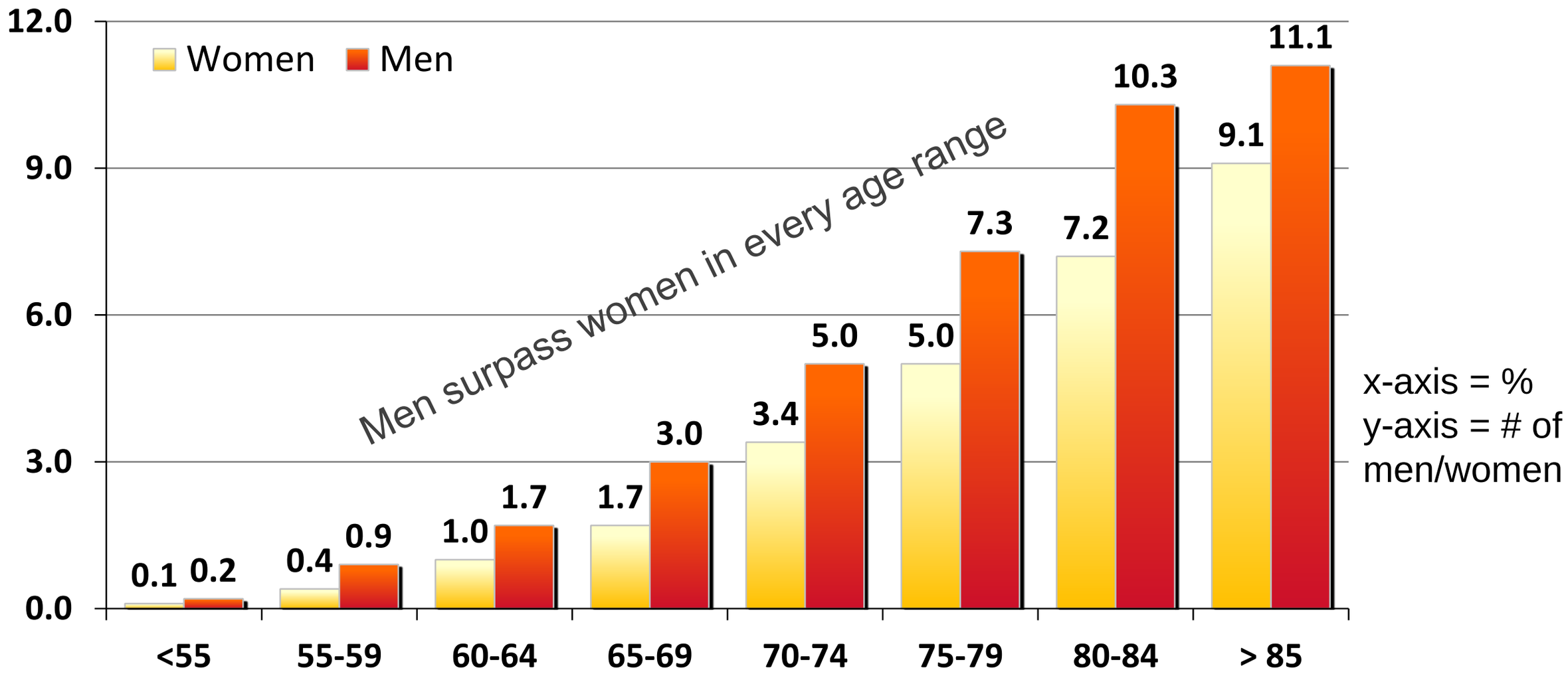
Data source: Baily D. J Am Coll Cardiol. 1992;19(3):41A.

An 82 year old man has what chance of having atrial fibrillation?

1. 1%
2. 5%
3. 10%
4. 25%

Prevalence of Diagnosed AF

Stratified by Age and Sex



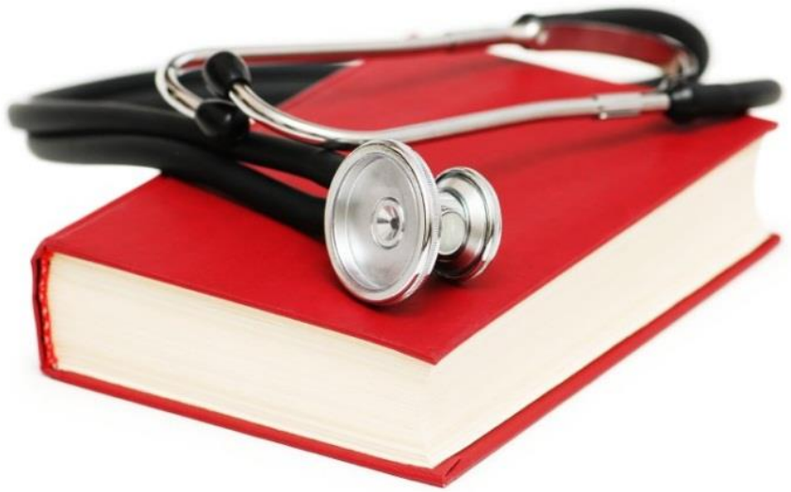
# Women	530	310	566	896	1498	1572	1291	1132
# Men	***1529***	***634***	***934***	***1426***	***1907***	***1886***	***1374***	***759***

Anticoagulation FORUM
BOSTON UNIVERSITY

Go AS, JAMA. 2001 May 9;285(18):2370-5. Pub Med PMID: 11343485

A 46 year old female patient is in for an annual physical exam. What is her lifetime risk of developing AF?

1. 1%
2. 5%
3. 10%
4. 25%



Incidence of AF

Lifetime Risk for AF at Selected Index Ages by Sex

Index Age, yrs	Men	Women
40	***26.0% (24.0 – 27.0)***	***23.0% (21.0 – 24.0)***
50	***25.9% (23.9 – 27.0)***	***23.2% (21.3 – 24.3)***
60	***25.8% (23.7 – 26.9)***	***23.4% (21.4 – 24.4)***
70	***24.3% (22.1 – 25.5)***	***23.0% (20.9 – 24.1)***
80	***22.7% (20.1 – 24.1)***	***21.6% (19.3 – 22.7)***

1 in 4

Men & women ≥40 Years will develop AF

Lifetime risk if currently free of AF

Anticoagulation FORUM

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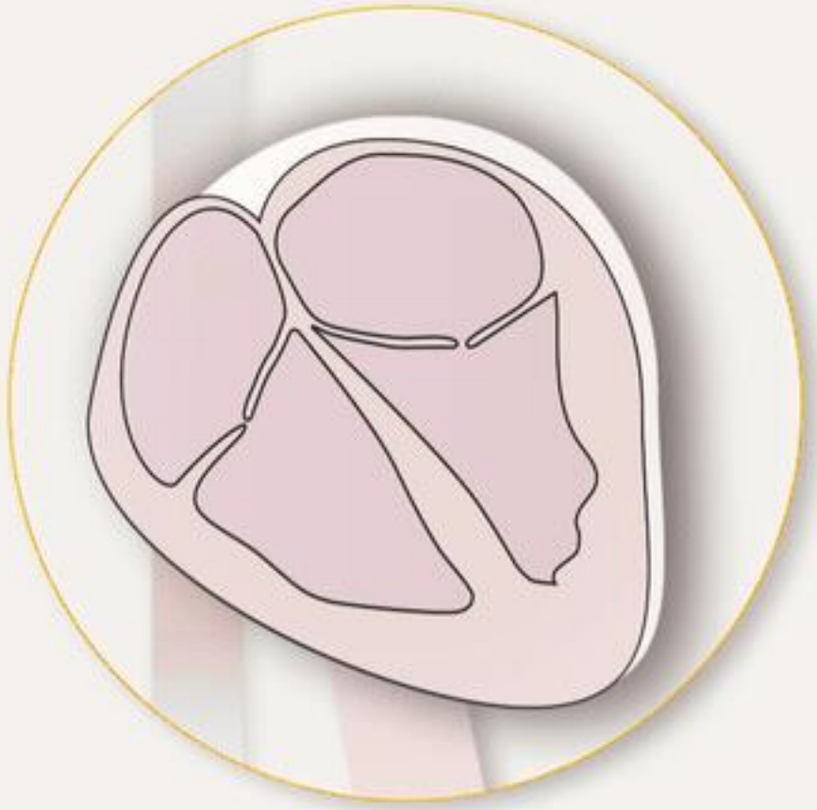
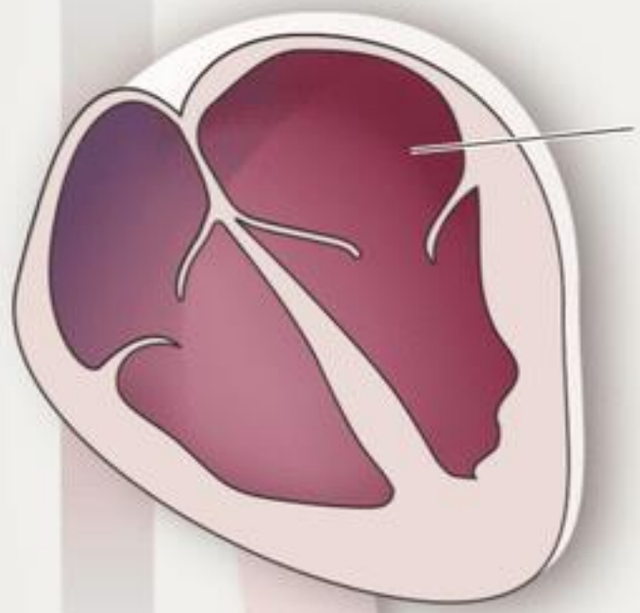
Lloyd-Jones DM, et al. Circulation. 2004 Aug 31;110(9):1042-6. Pub Med PMID: 15313941.

Atrial fibrillation (AFib) is the most common type of heart arrhythmia.





AFib occurs when the upper chambers and lower chambers are not coordinated, causing the heart to beat too slowly, too quickly, or irregularly.

Normal heartbeat

Irregular heartbeat

CDC

Two Major Concerns about Untreated Atrial Fibrillation

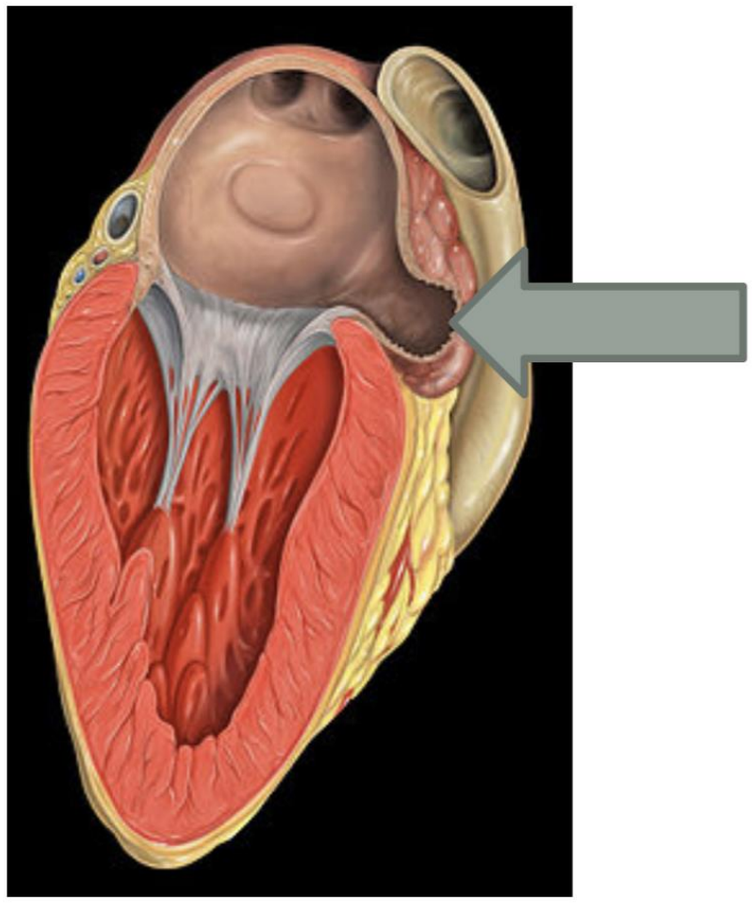
- Tachycardia Induced Cardiomyopathy - Due to Down regulation of Beta Receptors
- Stroke

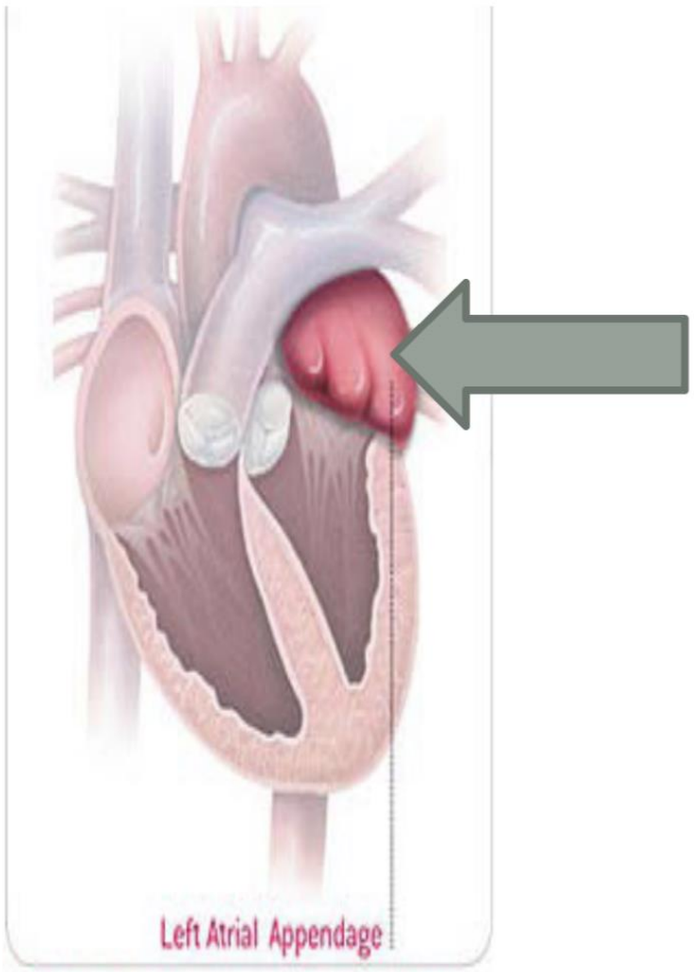
Stroke Risks in Atrial Fibrillation

- Atrial Fibrillation (AF) is the most common arrhythmia
- Affects 3.1 million people in the USA
- 1 % of people < 60 yo, but 10% of people over 80
- Yearly stroke risk in 50s, 1.5 % per year
- Yearly stroke risk in 80s, 23.5 % per year
- Mortality rate of patients with AF is twice those in Normal Sinus Rhythm even when adjusted for severity of underlying heart disease

Left Atrial Appendage Most Common Source of Thrombus

- Muscular sac off of left atrium
- Old name “Left Auricle”
- Our most lethal human attachment

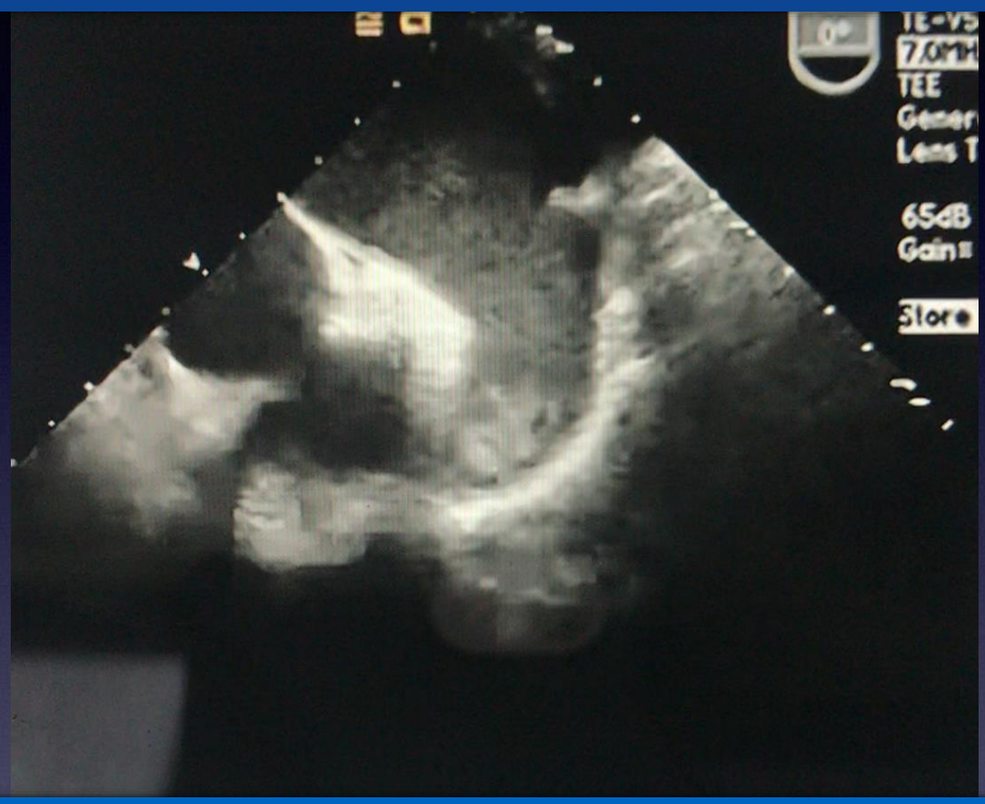




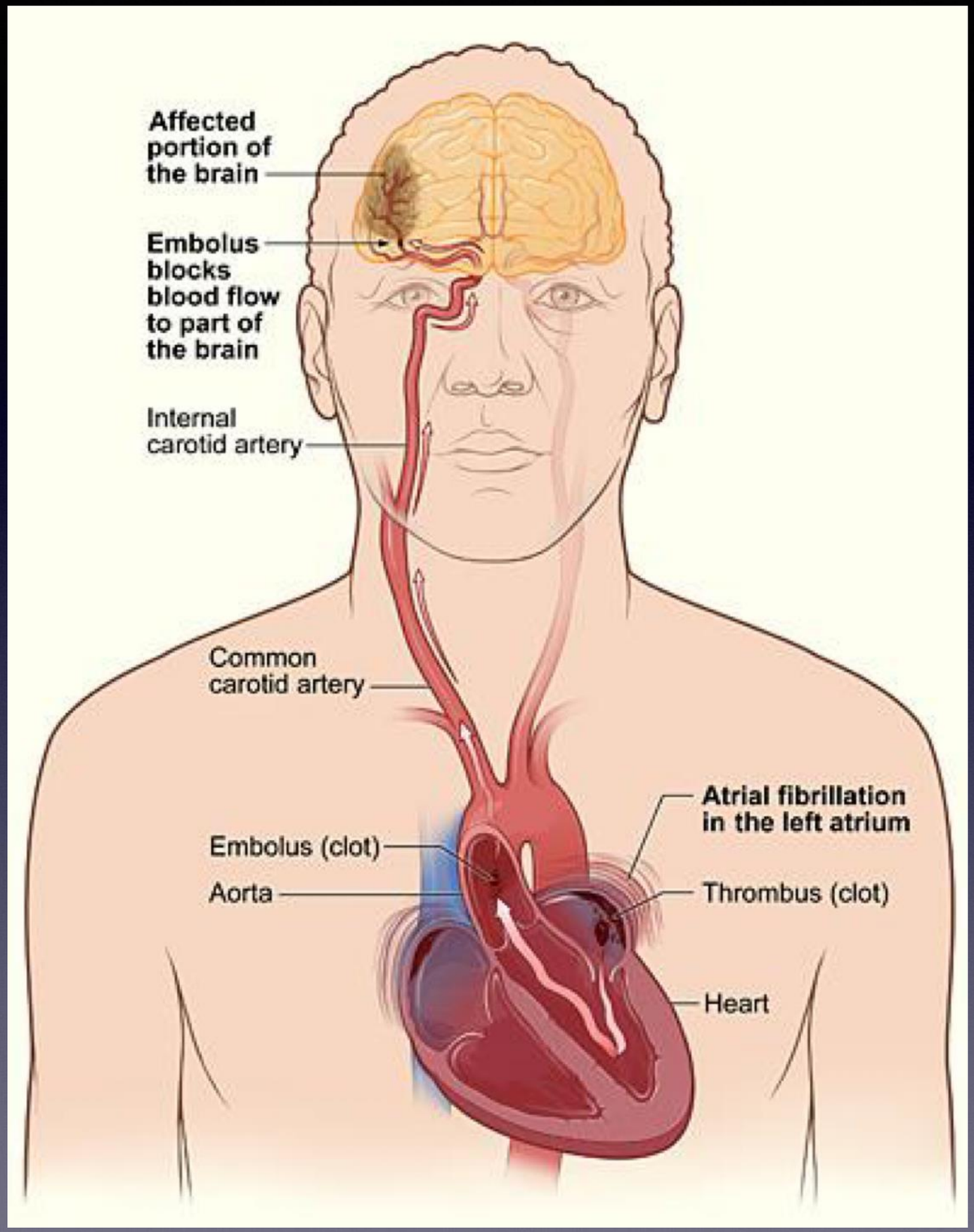
The Left Atrial Appendage (LAA) is a pouch like extension on the left side of the heart

Courtesy of Bostonscientific.com

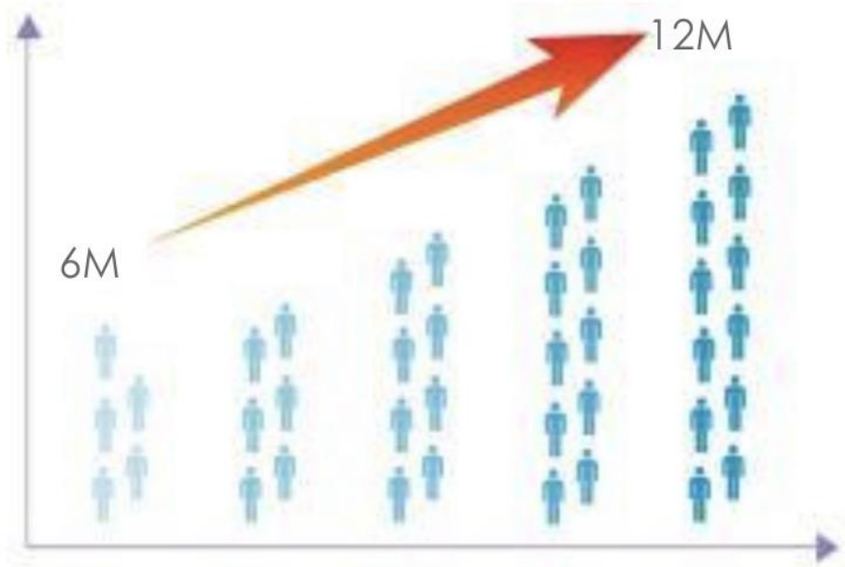
Left Atrial Appendage



THROMBUS


Affected portion of the brain
Embolus blocks blood flow to part of the brain
Internal carotid artery
Common carotid artery
Atrial fibrillation in the left atrium
Embolus (clot)
Aorta
Thrombus (clot)
Heart

Atrial Fibrillation: An Independent Risk Factor for Stroke



~6M

people with AF in U.S., expected to more than double by 2030[1]

5X increased risk of stroke for AF patients[2]

1 in 6 strokes occur in patients with AF[3]

~2X greater likelihood of stroke recurrence in AF patients (within 6 months)[4]

[1]Benjamin EJ. et al, Heart Disease and Stroke Statistics—2018 Update: A Report From the American Heart Association. Circulation. 2018; 137: e67-e492.
[2]Holmes DR, Atrial Fibrillation and Stroke Management: Present and Future, Seminars in Neurology 2010;30:528–536
[3]Hart RG, Halperin JL. Atrial fibrillation and thromboembolism: a decade of progress in stroke prevention. *Ann Intern Med.* 1999.
[4]Wolf PA et al, Duration of Atrial Fibrillation and the Imminence of Stroke: The Framingham Study, Stroke 1983; 14:664-667

Atrial Fibrillation Some Definitions

- First Detected, may be either paroxysmal or persistent
- Paroxysmal (Self-terminating),< seven days, most less than 24 hours
- Persistent(not self-terminating), lasting longer than 7 days, requires treatment to convert to sinus rhythm
- Permanent: longstanding (generally > 1 year) in which sinus rhythm can not be maintained in spite of treatment or treatment has been abandoned, patient is always in AF

Atrial Fibrillation Definitions Cont.

- Recurrent: 2 or more episodes
- Lone Atrial Fibrillation: <60 yo without cardiac disease or hypertension
- Nonvalvular Atrial Fibrillation: AF without evidence of rheumatic heart disease, mitral valve disease, prosthetic heart valve, or mitral valve repair
- Recent Onset Atrial Fibrillation (ROAF): < 48 hours, absolutely known onset, may be lone or recurrent
- New Onset= First Detected

- Different studies use different definitions

Scoring Systems in Stroke Risk

- A variety of systems have been published
  - Outlined on next slide
- All use selected clinical characteristics to predict the risk of stroke
- Most widely used is the CHA_2DS_2-VASc
- All scores provide a rough estimate of risk of thrombosis in a population at similar risk as patient being reviewed

CHA_2DS_2-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 *(prior myocardial infarction, peripheral artery disease, or aortic plaque)*	1
Age 65-74 y	1
Sex category *(i.e. female gender)*	1

LV = left ventricular; TE = thromboembolism

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

CHA_2DS_2-VASc

- Score 9 stroke risk/ year 15.2%
- Score 8 stroke risk/ year 6.7 %
- Score 7 stroke risk/ year 9.6 %
- Score 6 stroke risk/ year 9.8 %
- Score 5 stroke risk/ year 6.7 %
- Score 4 stroke risk/ year 4.0 %
- Score 3 stroke risk/ year 3.2 %
- Score 2 stroke risk/ year 2.2 %
- Score 1 stroke risk/ year 1.3 %
- Score 0 stroke risk/ year 0.0 %

- Note score 8, not a mistake, had less patients in category

- Yip et al, European Guidelines

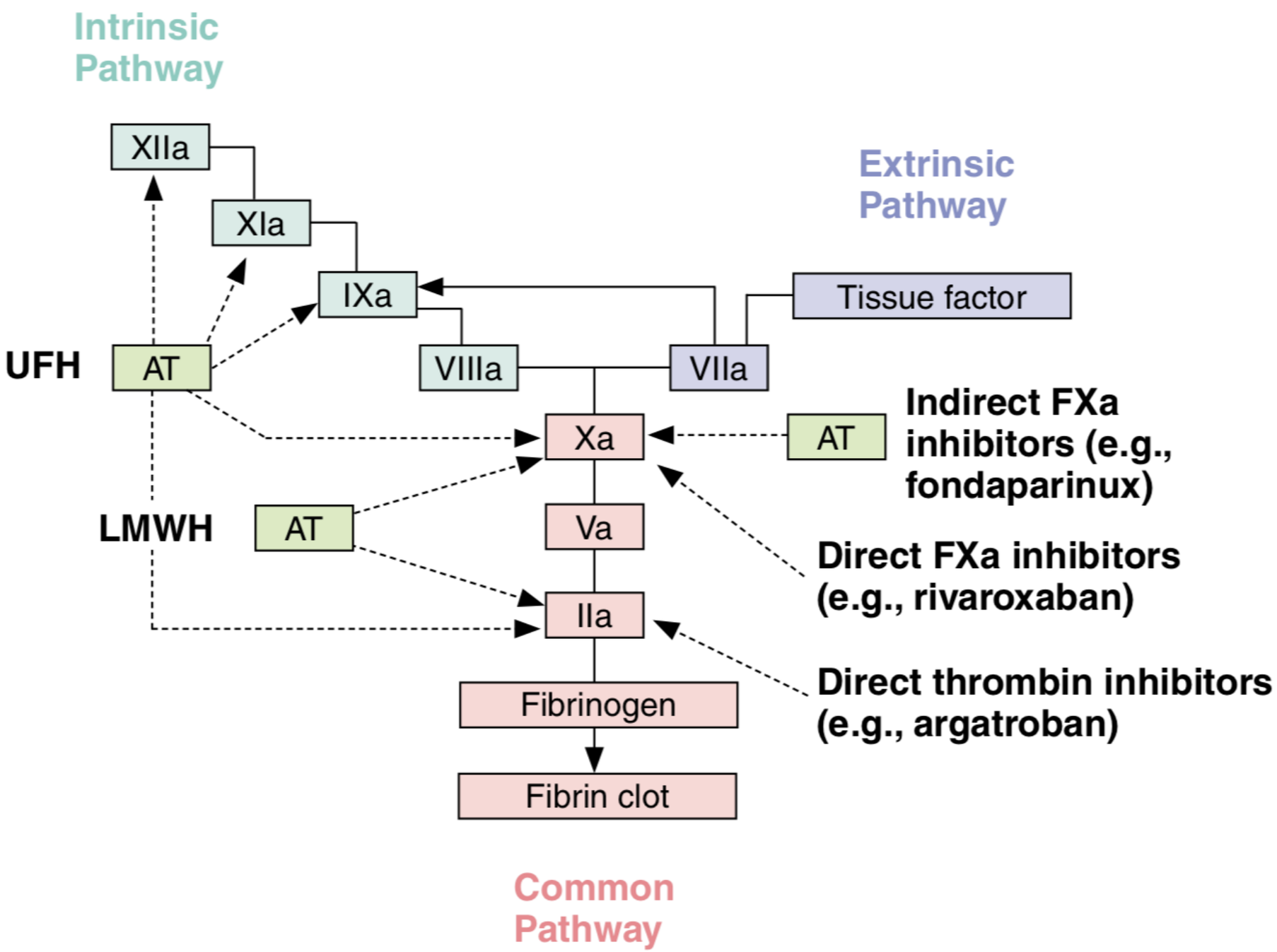
Stroke Prevention in Atrial Fibrillation

Anticoagulants

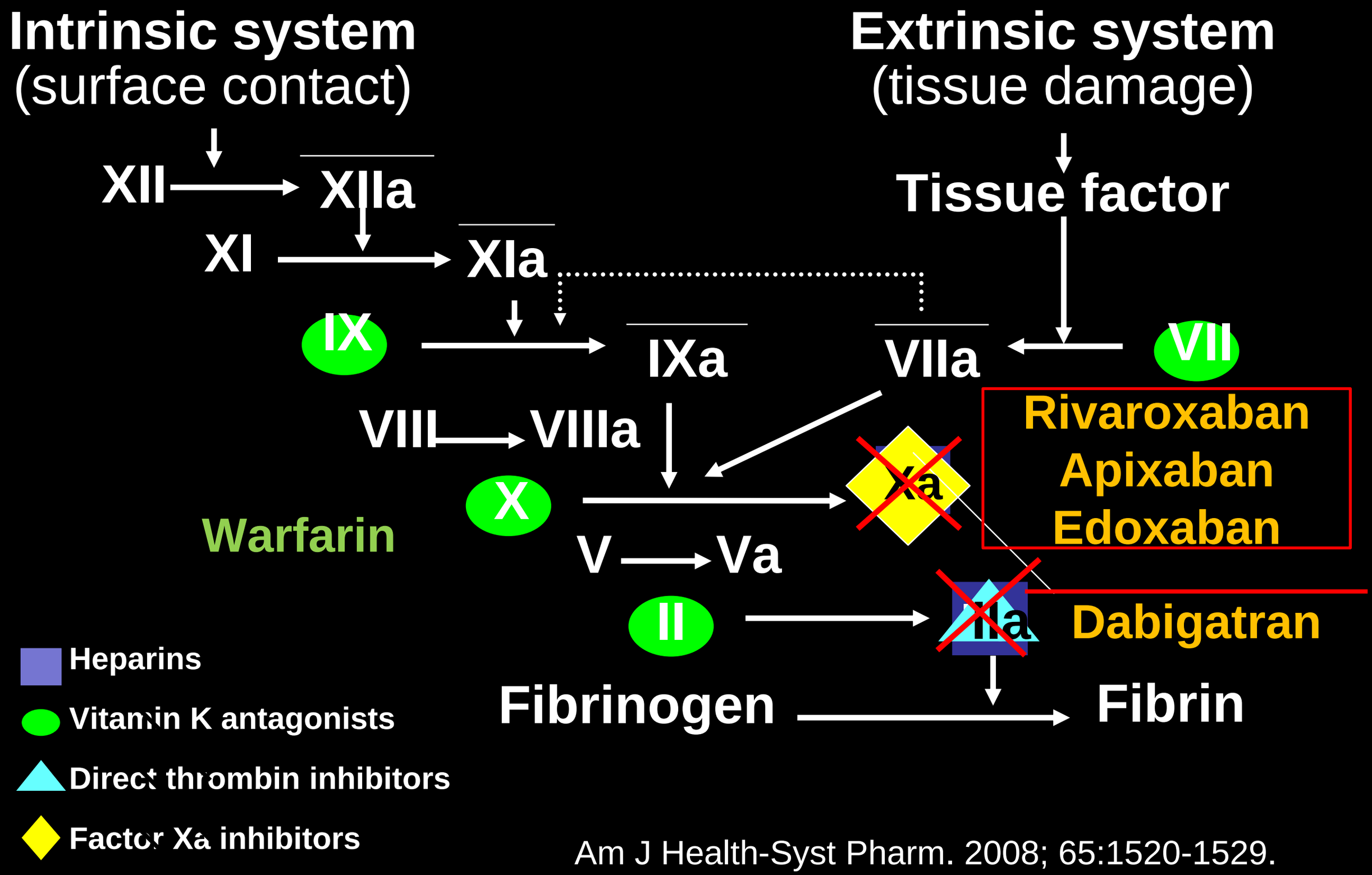
- VKA-Vitamin K Antagonist (warfarin)
- DOAC-Direct Oral Anticoagulant
- TSOAC-Target Specific Oral Anticoagulant
- NOAC-Novel (or New or Non-vitamin K) Oral Anticoagulant

Direct oral anticoagulants (DOACs) are oral medications that specifically inhibit factors IIa or Xa. They are also known as new oral anticoagulants (**NOACs**) or target-specific oral anticoagulants (TSOACs). DOACs are the preferred name according to the International Society of Thrombosis and Haemostasis

Figure 1. Mechanisms of action of antithrombotic agents, other than warfarin, in the clotting cascade. Unfractionated heparin (UFH), low-molecular-weight heparin (LWMH), and indirect factor Xa (FXa) inhibitors bind with antithrombin (AT) and increase its inhibition of certain clotting factors. The UFH–AT complex inhibits factors XIIa, XIa, IXa, Xa, and IIa, whereas the LMWH–AT complex inhibits factors Xa and IIa. Indirect FXa inhibitors in complex with AT inhibit FXa only. Direct inhibitors of FXa and thrombin (factor IIa) exert antithrombotic effects without having to interact with AT. Dotted lines indicate inhibition.



Anticoagulants: Mode of Action



Am J Health-Syst Pharm. 2008; 65:1520-1529.

Risk reduction with warfarin

Reduces relative risk of stroke by approx 65 %

Absolute risk reduction:-

- **Primary stroke** **2.7 %**
- **Secondary stroke** **8.4 %**

Numbers needed to treat for 1 year to prevent 1 stroke:-

- **Primary stroke** **37**
- **Secondary stroke** **12**
- **Overall** **25 (approx)**

- Warfarin is very effective at preventing stroke in patients with atrial fibrillation.

- Warfarin has several limitations, including drug and food interactions, a narrow therapeutic range, need for anticoagulation monitoring, and bleeding.

Available Direct Acting Oral Anticoagulants (DOACs)

- Dabigatran

- Rivaroxaban

- Apixaban

- Edoxaban

NOACS

Studies show to be at least as effective and probably more effective than Warfarin at stroke reduction in AF

Major Results of Phase 3 Trials of New Anticoagulants vs Warfarin in AF

Drug/Trial	Efficacy: Stroke/ Thromboembolism	Hemorrhagic Stroke	Major Bleeding
Dabigatran in RE-LY	34% reduction	74% reduction	Similar
Rivaroxaban in ROCKET	Noninferior to warfarin	40% reduction	Similar
Apixaban in ARISOTLE	20% reduction	50% reduction	30% reduction
Edoxaban ENGAGE AF –TIMI48	Noninferior to warfarin	46% reduction	20% reduction

Apixaban Approved: Now Which Anticoagulant to Use? *Medscape*. Jan 18, 2013. N Engl J Med 2013;369:2093-104. Stroke. 2014;45:2372-2378

ASPIRIN

There is no role for aspirin in the treatment of AF

It may be used in conjunction with an anticoagulant if there is coexisting vascular disease eg MI, PAD

Anticoagulation Regimen – Balancing Risks and Benefits

Recommendations for Selecting an Anticoagulant Regimen—Balancing Risks and Benefits		
COR	**LOE**	**Recommendations**
I	A B	**For patients with AF and an elevated CHA_2DS_2-VASc score of 2 or greater in men or 3 or greater in women, oral anticoagulants are recommended.** **Options include:** • **Warfarin (LOE: A)** • **Dabigatran (LOE: B)** • **Rivaroxaban (LOE: B)** • **Apixaban (LOE: B) or** • **Edoxaban (LOE: B-R)**

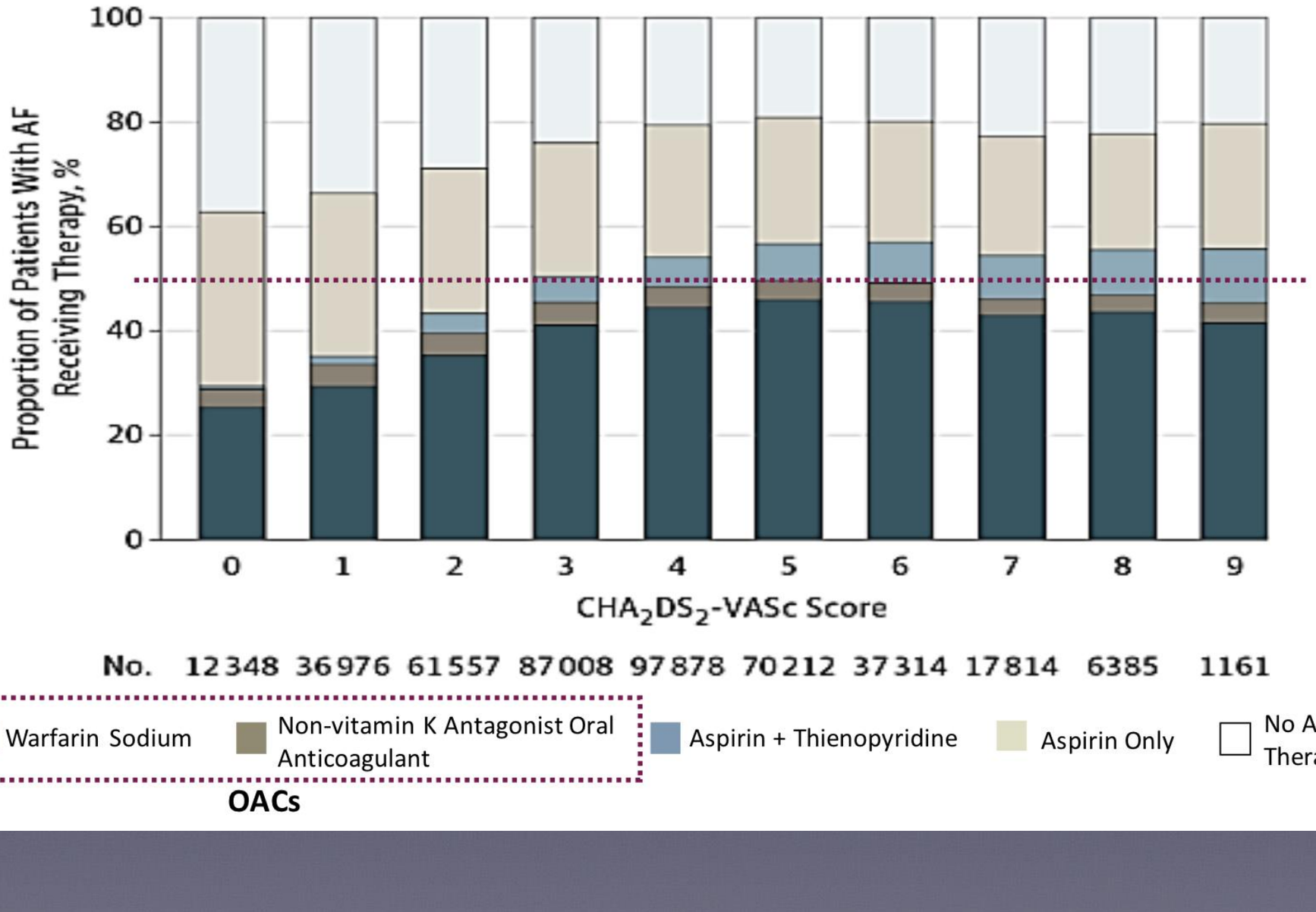
78 year old female with atrial fibrillation, hypertension and CHF.

CHA_2DS_2-VASc = 5 —— 6.7% annual risk for stroke.

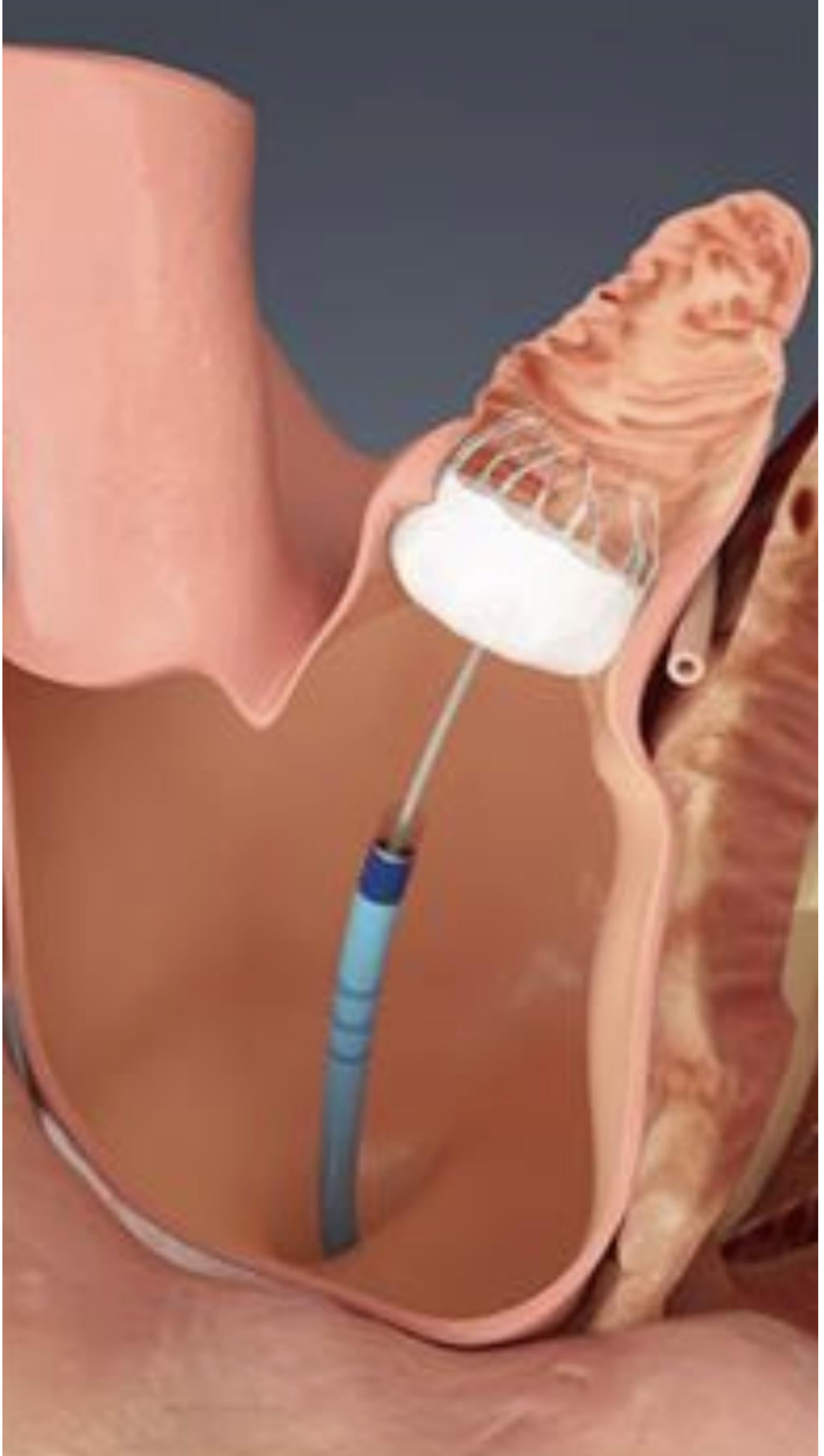
What would you use for stroke prevention?

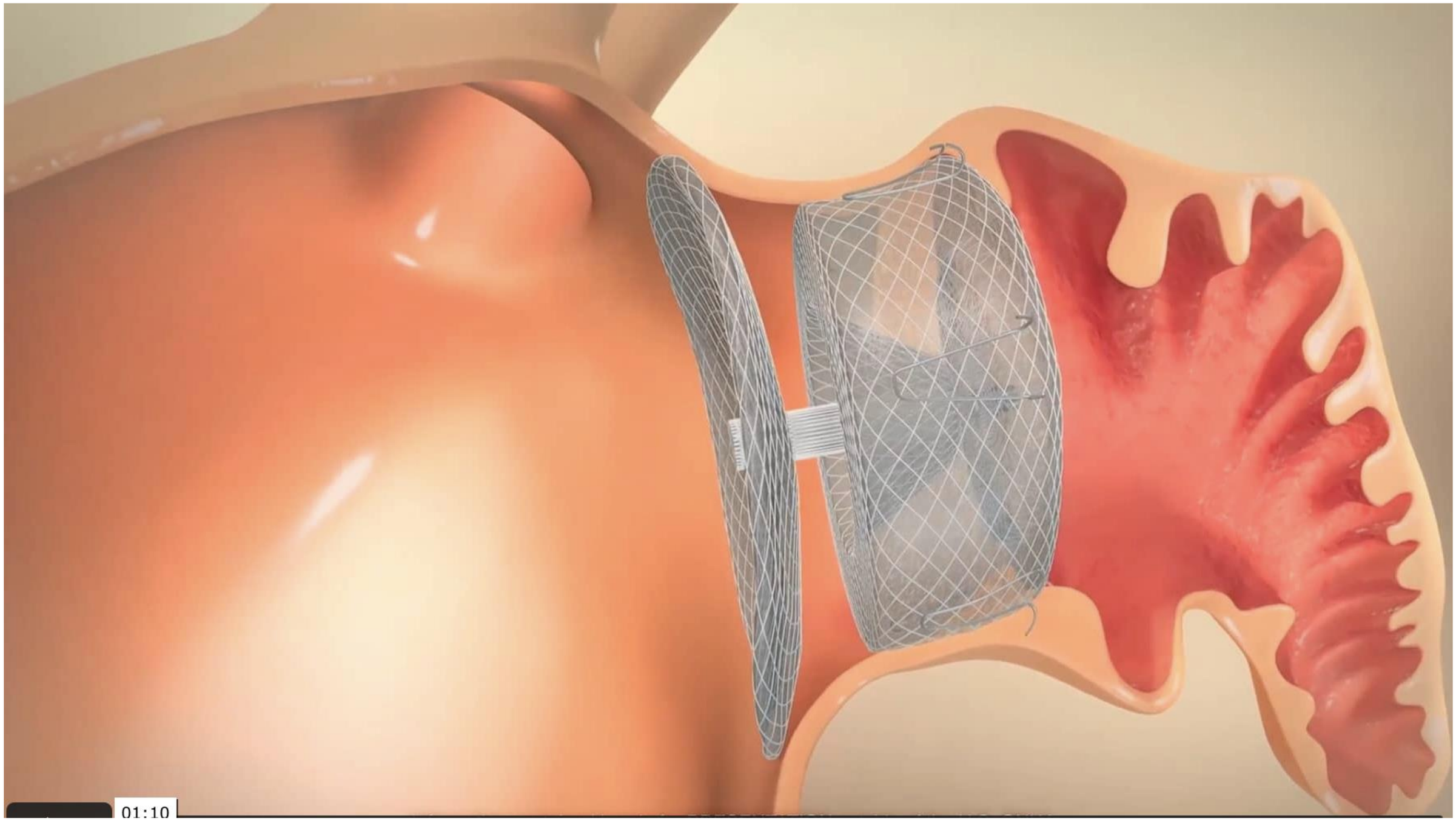
1. No anti-thrombotics
2. Aspirin
3. Aspirin + clopidogrel
4. VKA antagonist
5. Apixaban(Eliquis) or Rivaroxaban(Xarelto)

Oral Anticoagulation is Standard of Care, but Usage Peaks at ~50%



Despite increasing risk of stroke, the use of OAC in AF patients peaks at ~50%

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WATCHMAN Patient Criteria

1. Patient has Non-Valvular Atrial Fibrillation (NVAF)

2. Patient has an increased risk for stroke and is recommended for oral anticoagulation (OAC)
   CHA_2DS_2-VASc of ≥ 2 (or CHA_2DS_2-VASc of ≥ 3 for Medicare patients)

3. Patient is suitable for short-term warfarin therapy but deemed unable to take long-term OAC

4. Patient has an appropriate rationale to seek a non-pharmacologic alternative to warfarin.

WATCHMAN Therapy Candidates

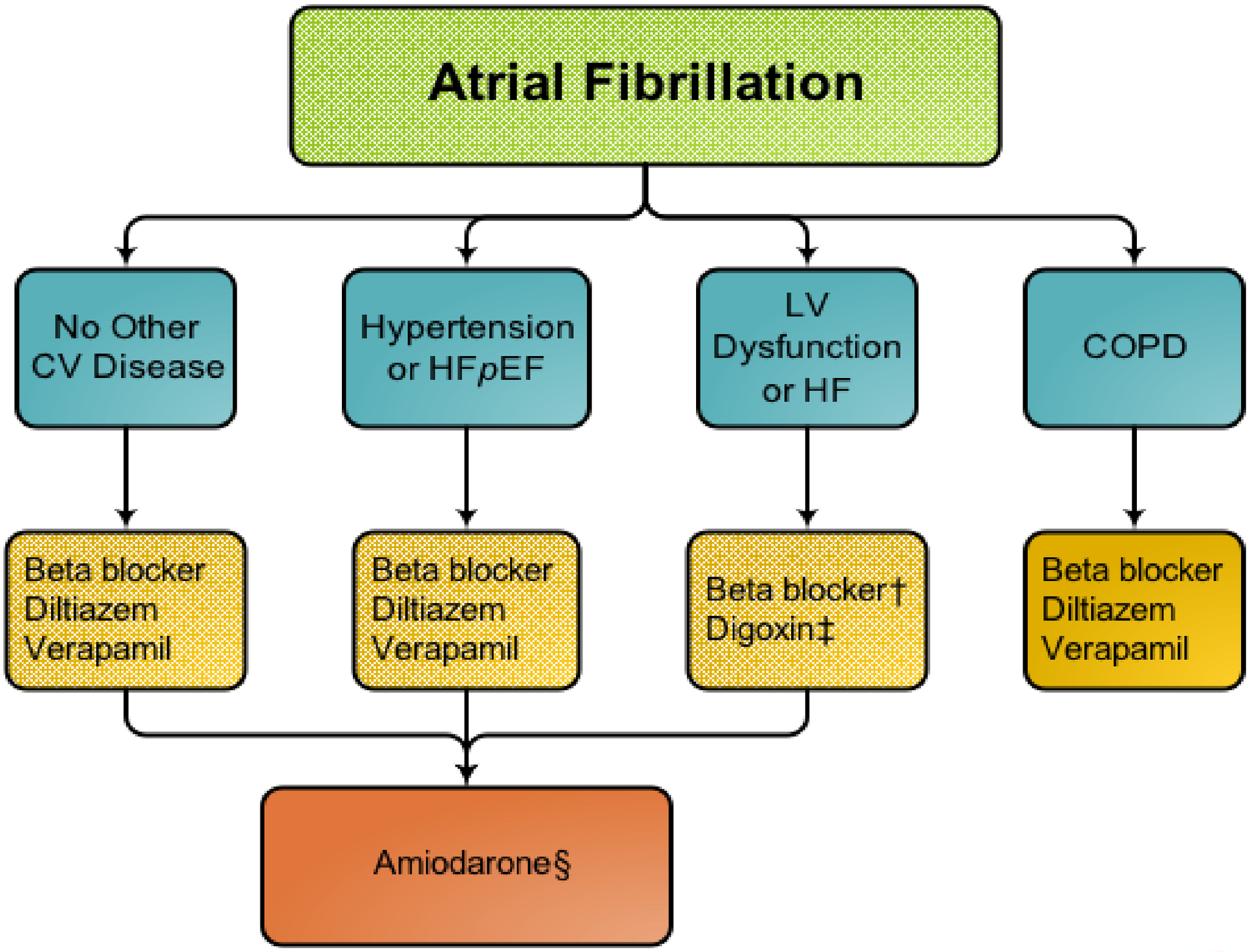
What type of LAAC candidates are you referring today?

Drug Interactions	Bleeder	Future Bleeder	Non-Compliant	Lifestyle
Not suitable for long-term warfarin use due to other medical treatment needs	History of major and/or non-major bleeding	No prior bleeds but high-risk / include fall risk	Tolerant, but not taking OAC	Patient prefers device over OAC

Guideline for the Management of Patients With Atrial Fibrillation

Rate Control

Approach to Selecting Drug Therapy for Ventricular Rate Control*



- Assess Rate Control with Ambulatory Monitoring
- Chest Discomfort, Dizziness, Dyspnea May resolve with Rate Control
- Relief of Fatigue generally requires return to sinus rhythm
- *If Asymptomatic, there may be other factors which would prompt use of AADs.*

Guideline for the Management of Patients With Atrial Fibrillation

Rhythm Control

Antiarrhythmic Drugs to Maintain Sinus Rhythm

Recommendations	COR	LOE
Before initiating antiarrhythmic drug therapy, treatment of precipitating or reversible causes of AF is recommended.	I	C
The following antiarrhythmic drugs are recommended in patients with AF to maintain sinus rhythm, depending on underlying heart disease and comorbidities: • Amiodarone • Dofetilide • Dronedarone • Flecainide • Propafenone • Sotalol	I	A
The risks of the antiarrhythmic drug, including proarrhythmia, should be considered before initiating therapy with each drug.	I	C

THE DECISION to MAINTAIN SINUS RHYTHM

RATE CONTROL STRATEGY vs RHYTHM CONTROL STRATEGY

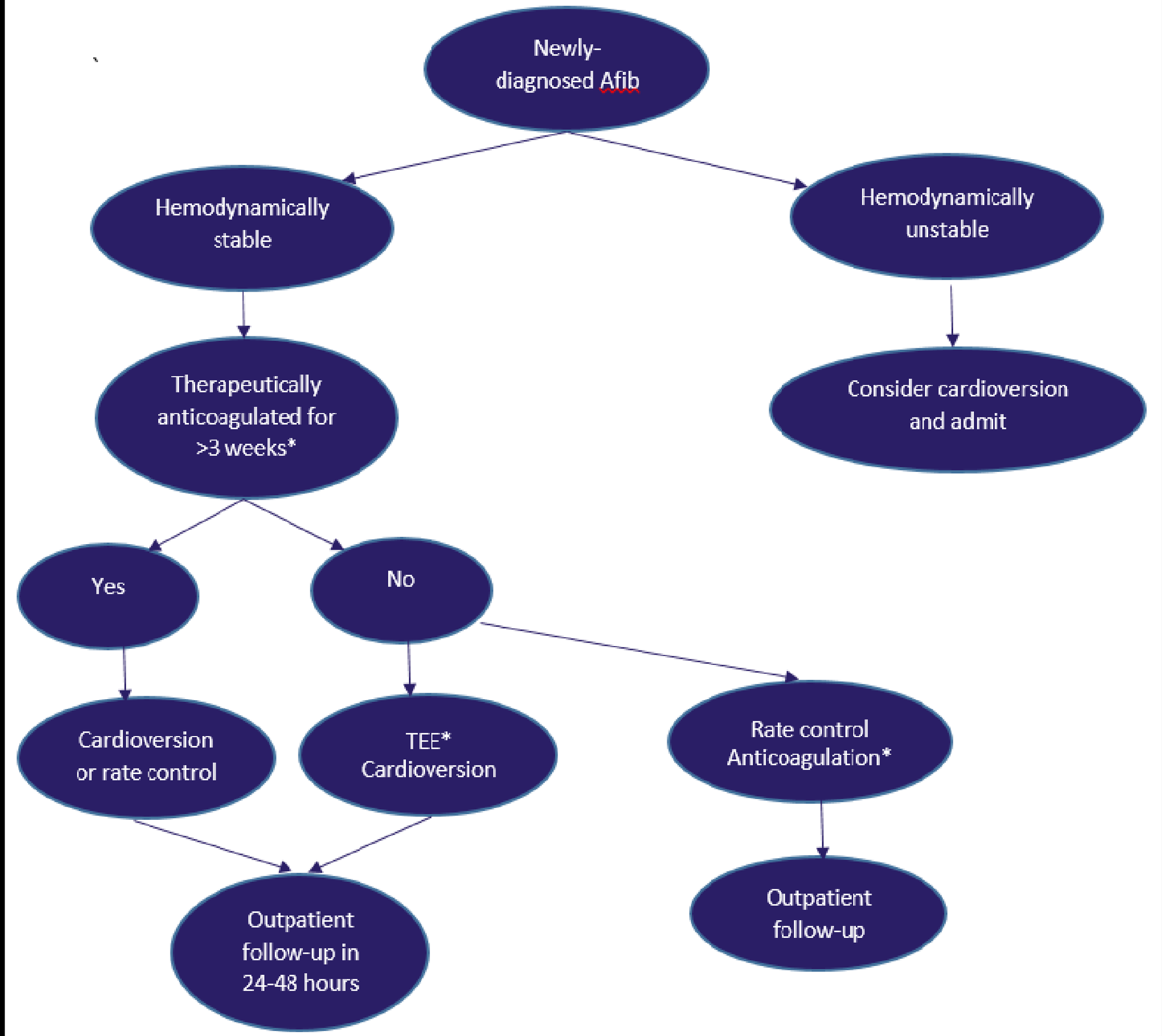
STUDIES in PRIMARILY PATIENTS AGED >= 60 years with at least 1 RISK FACTOR for STROKE

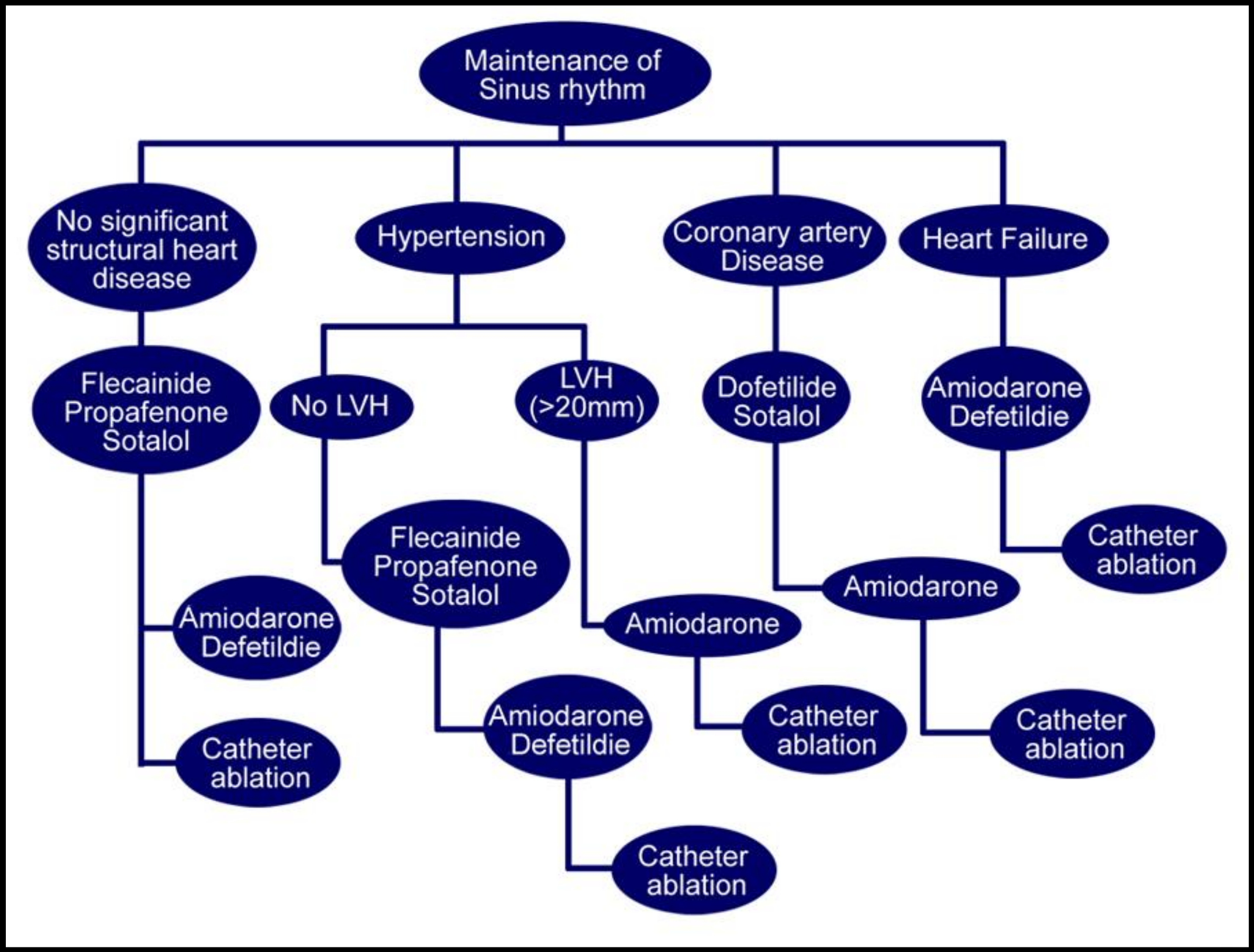
NO MORTALITY BENEFIT ASSOCIATED with a RHYTHM CONTROL STRATEGY

1
Wyse DG, Waldo AL, DiMarco JP, Domanski MJ, Rosenberg Y, Schron EB, Kellen JC, Greene HL, Mickel MC, Dalquist JE, Corley SD. A comparison of rate control and rhythm control in patients with atrial fibrillation. *N Engl J Med*. 2002;*347*:1825–1833. Crossref. PubMed.
2.
Carlsson J, Miketic S, Windeler J, Cuneo A, Haun S, Micus S, Walter S, Tebbe U. Randomized trial of rate-control versus rhythm-control in persistent atrial fibrillation: the Strategies of Treatment of Atrial Fibrillation (STAF) study. *J Am Coll Cardiol*. 2003;*41*:1690–1696. Crossref. PubMed.
3.
Opolski G, Torbicki A, Kosior DA, Szulc M, Wozakowska-Kaplon B, Kolodziej P, Achremczyk P. Rate control vs rhythm control in patients with nonvalvular persistent atrial fibrillation: the results of the Polish How to Treat Chronic Atrial Fibrillation (HOT CAFE) study. *Chest*. 2004;*126*:476–486. Crossref. PubMed.
4.
Van Gelder IC, Hagens VE, Bosker HA, Kingma JH, Kamp O, Kingma T, Said SA, Darmanata JI, Timmermans AJ, Tijssen JG, Crijns HJ. A comparison of rate control and rhythm control in patients with recurrent persistent atrial fibrillation. *N Engl J Med*. 2002;*347*:1834–1840. Crossref. PubMed.
5.
Hohnloser SH, Kuck KH, Lilienthal J. Rhythm or rate control in atrial fibrillation: Pharmacological Intervention in Atrial Fibrillation (PIAF): a randomised trial. *Lancet*. 2000;*356*:1789–1794. Crossref. PubMed.

2) WHEN SHOULD AN AAD BE STARTED ?

- Not With First Episode - *Unless ...*
- *Hemodynamic Alterations*
- *Heart Failure*
- *Recurrence threatens mortality or rapid hospitalization*
- *Establish sense of AF Pattern*
- *Infrequent - “ Pill in Pocket “*
- *Decision based on lifestyle satisfaction*


Newly-diagnosed Afib
Hemodynamically stable
Hemodynamically unstable
Therapeutically anticoagulated for >3 weeks*
Consider cardioversion and admit
Yes
No
Cardioversion or rate control
TEE* Cardioversion
Rate control Anticoagulation*
Outpatient follow-up in 24-48 hours
Outpatient follow-up


Maintenance of Sinus rhythm
No significant structural heart disease
Hypertension
Coronary artery Disease
Heart Failure
Flecainide Propafenone Sotalol
No LVH
LVH (>20mm)
Dofetilide Sotalol
Amiodarone Defetildie
Amiodarone Defetildie
Flecainide Propafenone Sotalol
Amiodarone
Amiodarone
Catheter ablation
Catheter ablation
Amiodarone Defetildie
Catheter ablation
Amiodarone
Catheter ablation
Catheter ablation

Turagam MK, Musikantow D, Whang W, et al.

Assessment of Catheter Ablation or Antiarrhythmic Drugs for First-line Therapy of Atrial Fibrillation: A Meta-Analysis of Randomized Clinical Trials. JAMA Cardiol 2021;Apr28

Ablation was associated with a 38% reduction in atrial arrhythmias and a 68% reduction in hospitalizations, compared with the drugs.

Left Atrium, Posterior Wall

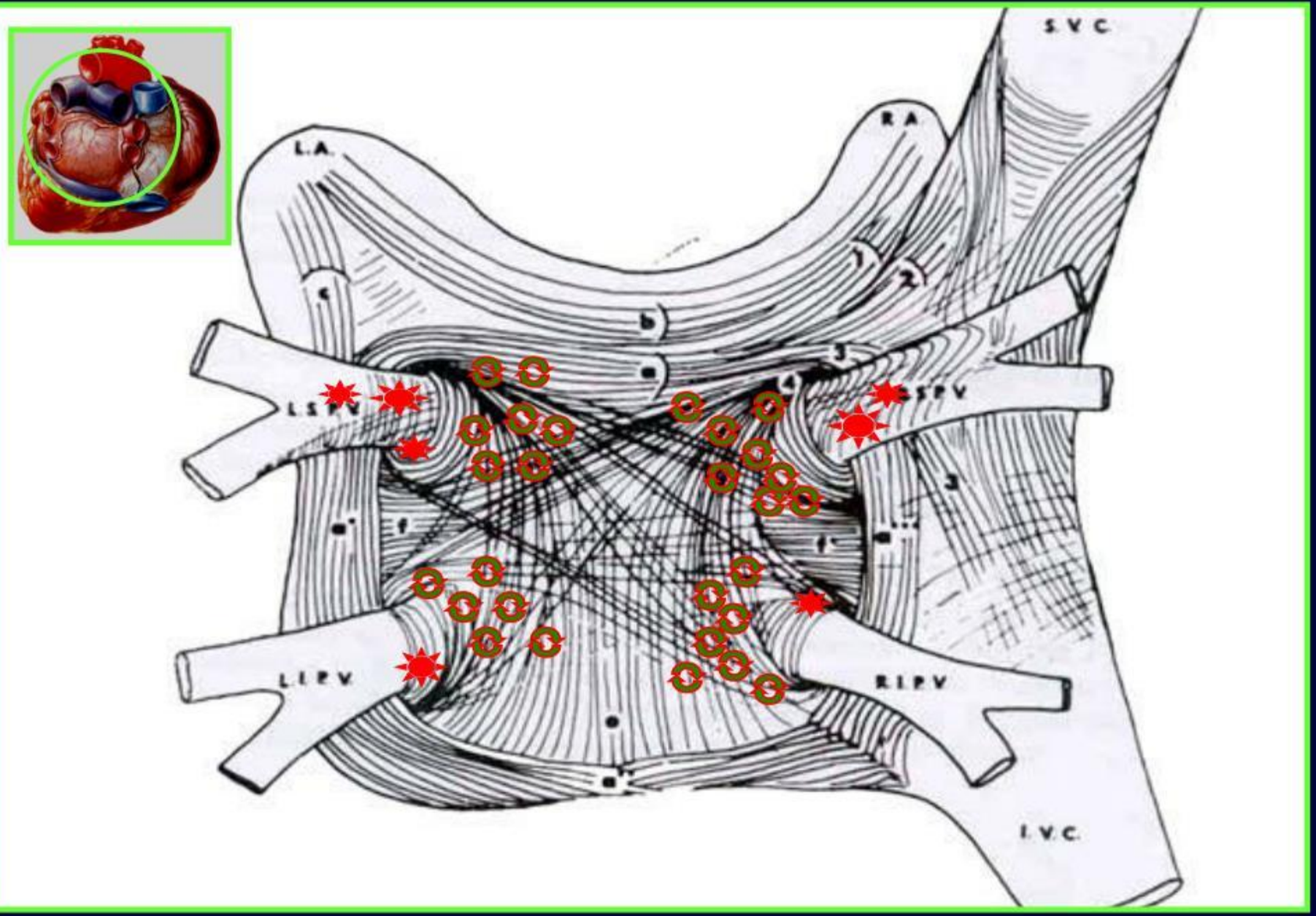


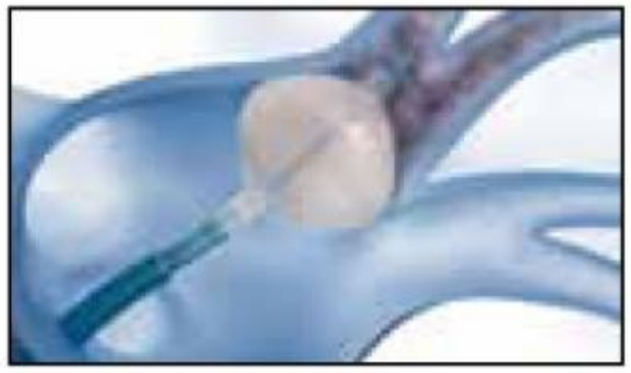
Figure 3

Cryoballoon Ablation

A

1. Wire Targeted Vein

2. Inflate and Position



3. Occlude and Albate

B

C

Ablates at the point of balloon contact

Question #4

78 year old male with atrial fibrillation and hypertension (CHADS2 score = 2 [4% stroke rate per year]). What is his annual major bleeding rate?

1. 1%
2. 2%
3. 3%
4. 5%
5. 10%

HAS-BLED Score for Major Bleeding Risk ☆

Estimates risk of major bleeding for patients on anticoagulation to assess risk-benefit in atrial fibrillation care.

When to Use ⌄ | Pearls/Pitfalls ⌄ | Why Use ⌄

Hypertension Uncontrolled, >160 mmHg systolic	No 0	**Yes +1**
Renal disease Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L	**No 0**	Yes +1
Liver disease Cirrhosis or bilirubin >2x normal with AST/ALT/AP >3x normal	**No 0**	Yes +1
Stroke history	**No 0**	Yes +1
Prior major bleeding or predisposition to bleeding	**No 0**	Yes +1
Labile INR Unstable/high INRs, time in therapeutic range <60%	**No 0**	Yes +1
Age >65	No 0	**Yes +1**
Medication usage predisposing to bleeding Aspirin, clopidogrel, NSAIDs	**No 0**	Yes +1
Alcohol use ≥8 drinks/week	**No 0**	Yes +1

2 points

Risk was 4.1% in one validation study (Lip 2011) and 1.88 bleeds per 100 patient-years in another validation study (Pisters 2010).

Anticoagulation can be considered, however patient does have moderate risk for major bleeding (~2/100 patient-years).

Bleeding vs Thrombosis Risk

Selected Scoring Systems for Bleeding Risk Assessment in Patients with Atrial Fibrillation Receiving Oral Anticoagulant Therapy[27-29,a]

Risk Factor	Points
HEMORR$_2$HAGES[b]	
Hepatic or renal disease	1 for each
Ethanol use	1
Malignancy	1
Age >75 years	1
Reduced platelet count or function	1 for each
Re-bleeding	2
Hypertension, uncontrolled	1
Anemia	1
Genetic factors	1
Elevated fall risk ± neuropsychiatric disease	1
Stroke	1
Maximum score	14
HAS-BLED[c]	
Hypertension, systolic blood pressure >160 mm Hg	1
Abnormal renal or liver function	1 for each
Stroke	2
Bleeding history or predisposition	1
Labile INRs	2
Age >65 years	1
Antiplatelet or NSAID use	1
Alcohol use >8 servings/week	1
Maximum score	11

[a]INR = International Normalized Ratio, NSAID = nonsteroidal antiinflammatory drug.

[b]The risk for bleeding in patients with a HEMORR$_2$HAGES score of 0–1, 2–3, or 4 or more is low, moderate, or high, respectively.

[c]The risk for bleeding in patients with a HAS-BLED score of 0, 1–2, and 3 or more is low, moderate, or high, respectively.

Patient Risk Stratification for Perioperative Thromboembolism when Oral Anticoagulant Therapy Is Temporarily Interrupted[31]

High Risk (>10% annual risk for thromboembolism)

Atrial fibrillation
- Recent (within past three months) stroke or transient ischemic attack
- $CHADS_2$ score 5 or 6
- Rheumatic valvular heart disease

Mechanical heart valve
- Any caged-ball or tilting disc valve in mitral or aortic position
- Any mitral valve prosthesis
- Recent (within past six months) stroke or transient ischemic attack

Venous thromboembolism
- Recent (within past three months) venous thromboembolism
- Severe thrombophilia
  - Deficiency of protein C, protein S, or antithrombin
  - Antiphospholipid antibodies
  - Multiple thrombophilias

Moderate Risk (5–10% annual risk for thromboembolism)

Atrial fibrillation
- $CHADS_2$ score 3 or 4

Mechanical heart valve
- Bileaflet aortic valve prosthesis with major risk factors for stroke

Venous thromboembolism
- Venous thromboembolism within past 3–12 months
- Recurrent venous thromboembolism
- Non-severe thrombophilia (e.g., heterozygous factor V Leiden or prothrombin gene mutation)
- Active cancer (treated within past six months or palliative)

Low Risk (<5% annual risk for thromboembolism)

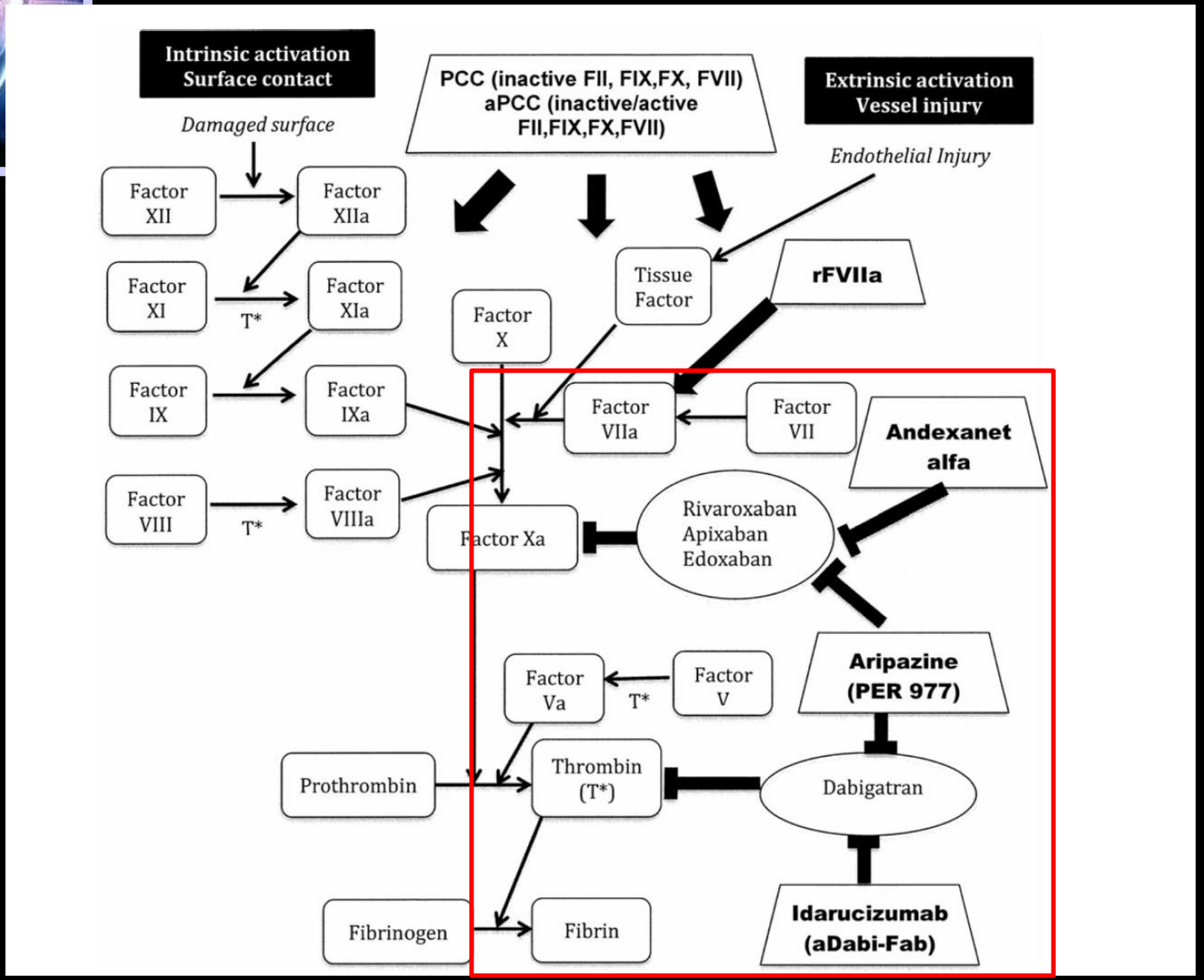
Atrial fibrillation
- $CHADS_2$ score 0–2 (without prior stroke or transient ischemic attack)

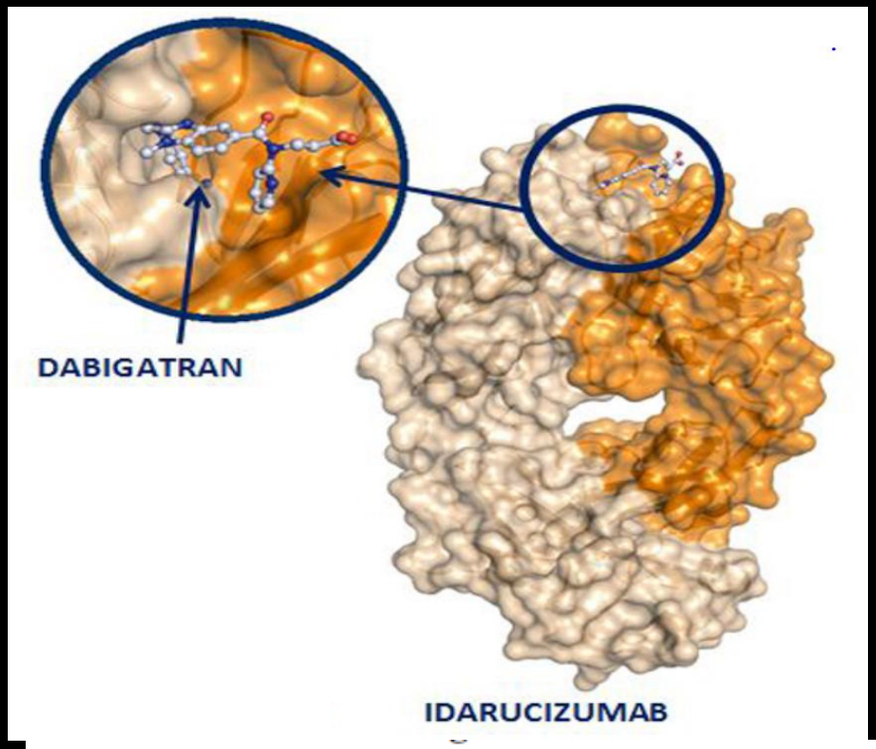
Mechanical heart valve
- Bileaflet aortic valve prosthesis without atrial fibrillation and major risk factors for stroke

Venous thromboembolism
- Venous thromboembolism more than 12 months ago with no other risk factors for thromboembolism

Am J Health-Syst Pharm. 2013; 70 (Suppl1):S3-11

NOAC Antidotes





NEW Anticoagulant Antidotes

Agents	Target	Structure	Route	MOA	Pharmacokinetics
Idarucizumab	Dabigatran	Humanized monoclonal antibody fragment	IV	Binds to dabigatran with a high affinity (~350 times greater affinity than thrombin) No binding to thrombin substrates (no procoagulant activity)	Biphasic $t_{1/2}$, ranging from 0.4 hrs to a terminal $t_{1/2}$ of 4.3 hrs
Andexanet alfa	Direct and indirect FXa inhibitors	Modified recombinant form of FXa	IV	Binds to FXa inhibitors with affinity similar to that of native FXa	Terminal $t_{1/2}$: ~6 hrs
Aripazine	Universal (oral FXa and FIIa inhibitors, UFH, LMWH, and fondaparinux	Small synthetic molecule	IV	Binds to TSOACs and heparin and reverses the anticoagulant effects	Not available

FIIa = factor IIa; FXa = factor Xa; IV = intravenous; LMWH = low-molecular-weight heparin; MOA = mechanism of action; $t_{1/2}$ = half-life; UFH = unfractionated heparin.

Pharmacotherapy 2015;35(2):198–207

Lowering The Risk of Developing Atrial Fibrillation

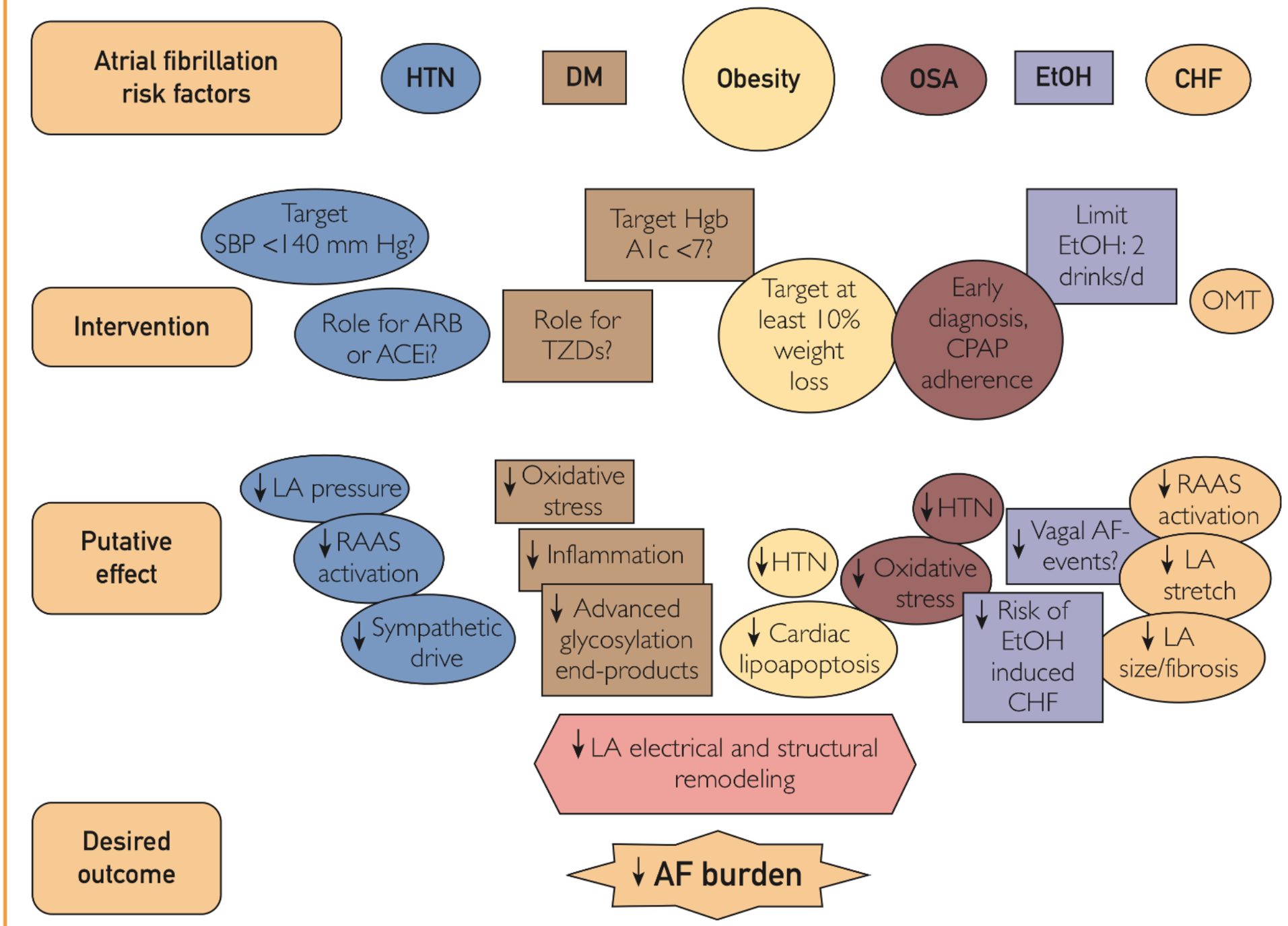


FIGURE 1. Atrial fibrillation risk factor modification and its putative effects. ACEi = angiotensin-converting enzyme inhibitor; AF = atrial fibrillation; ARB = angiotensin receptor blocker; CHF = congestive heart failure; CPAP = continuous positive airway pressure; DM = diabetes mellitus; EtOH = ethyl alcohol consumption; Hgb A1c = hemoglobin A_{1c}; HTN = hypertension; LA = left atrial; OMT = optimal medical therapy; OSA = obstructive sleep apnea; SBP = systolic blood pressure; TZD = thiazolidinedione; RAAS = renin-angiotensin-aldosterone system.

Take Home Message(s)

- Atrial Fibrillation is prevalent and its prevalence is predicted to double by 2030.
- In Atrial Fibrillation the risk of stroke often far exceeds the risk of bleeding complications with anticoagulant therapy.
- The risk of developing atrial fibrillation can be reduced.
- Anticoagulants are under prescribed and/or patients are failing to follow advice given by health care providers.

QUESTIONS??

Non-Valvular AF

- Patients without moderate to severe mitral stenosis
- Without Mechanical (Prosthetic) heart valves
- Without Mitral Valve repair in North American guidelines