Treating Heart Problems to Prevent Stroke

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Physician Presenter Disclaimer

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- Products, services, or therapies discussed in this presentation may be subject to regulatory approval/clearance and therefore labeling may change.

- Opinions given during this presentation are my personal, professional opinion.

Background

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- Tonight we will discuss two specific causes for stroke (CVA)
- AF (atrial fibrillation)
- PFO (patent foramen ovale)
- There are many reasons for stroke. However, we will keep tonight's lecture focused on these two issues so we can actually have a targeted discussion/Q+A regarding these entities.

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Atrial Fibrillation Overview

How the Heart Works

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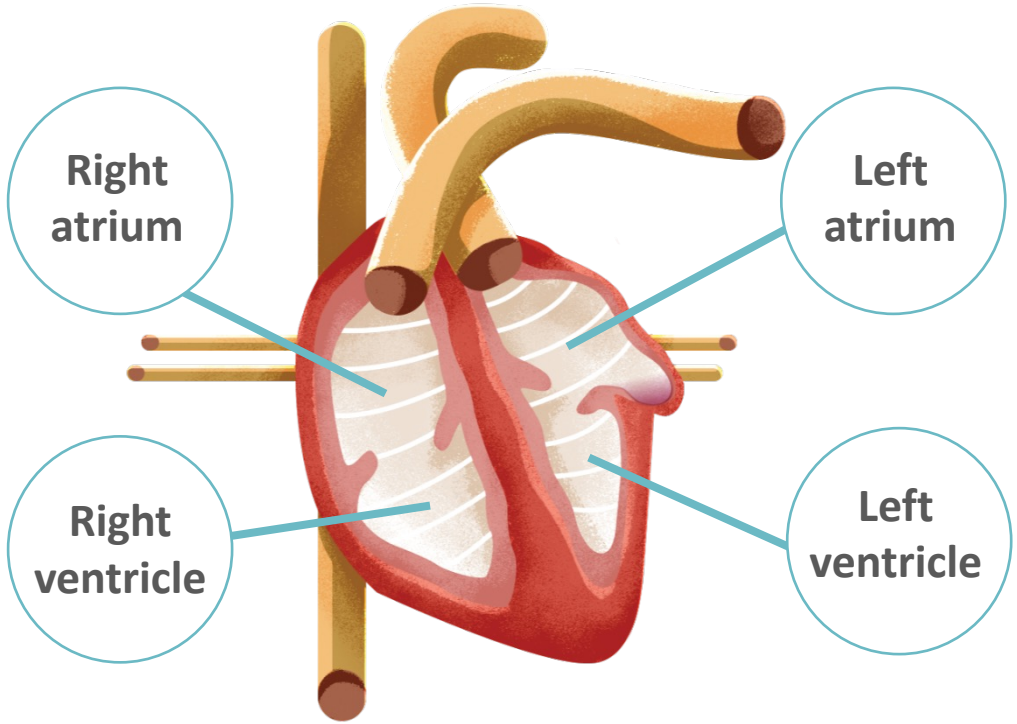
- The heart is divided into four chambers
  - **Atria:** two small, upper chambers
  - **Ventricles:** two larger, lower chambers



- Together, they pump blood to and from other parts of your body.

What is Atrial Fibrillation?

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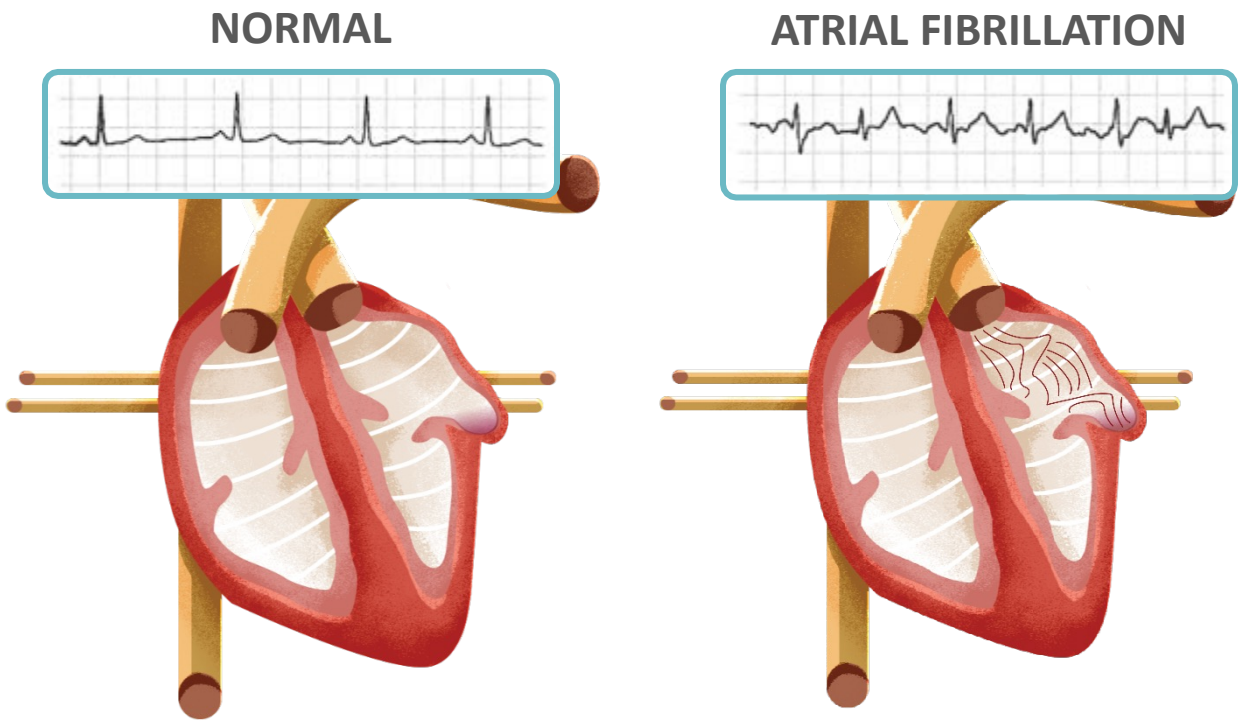
- Atrial Fibrillation or AFib is a heart condition that causes the upper chambers of your heart to beat too fast and in a chaotic rhythm.



You Are Not Alone

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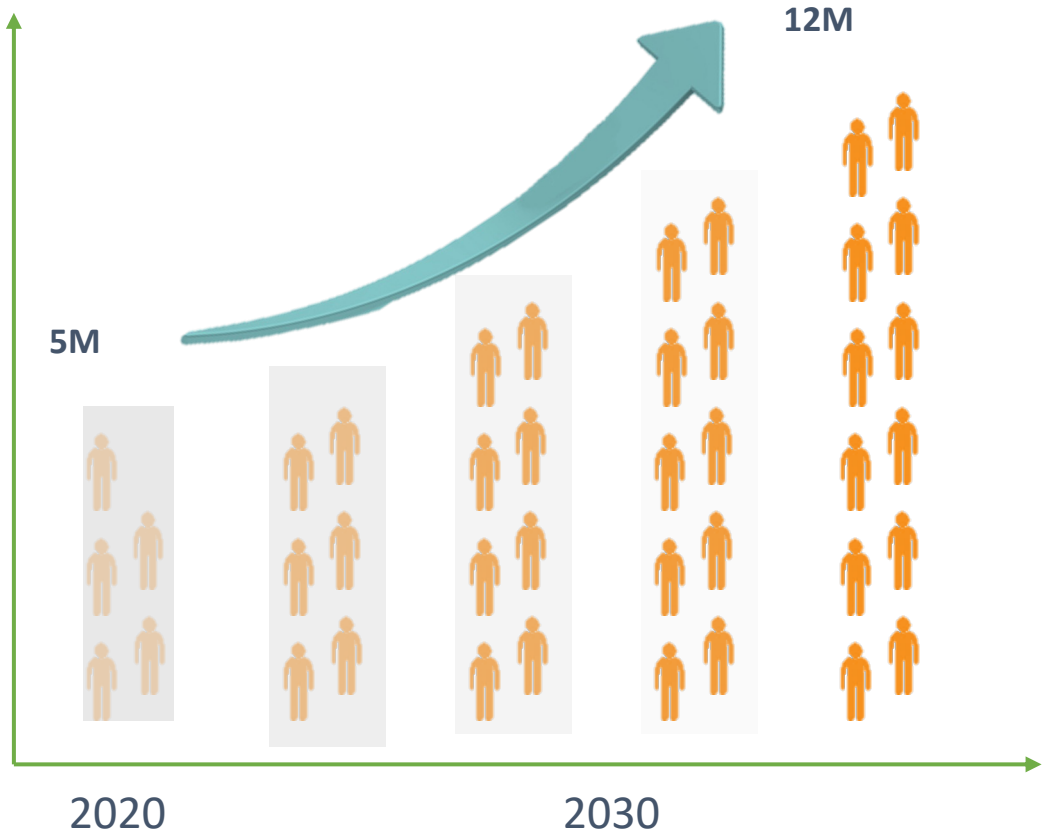
- Atrial Fibrillation is a common cardiac arrhythmia and is a growing problem
- Significant impact on your quality of life
- Treatment options are available



- ~5 M people with AFib in U.S.[1]
- By 2030, up to 12 million Americans may be affected[1]

Types of Atrial Fibrillation

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- **Paroxysmal**
  - Comes and goes
  - Usually stops on its own
- **Persistent**
  - Lasts less than 1 week
  - Can become permanent
- **Permanent**
  - Heart cannot be restored to normal rhythm

What Causes Atrial Fibrillation?

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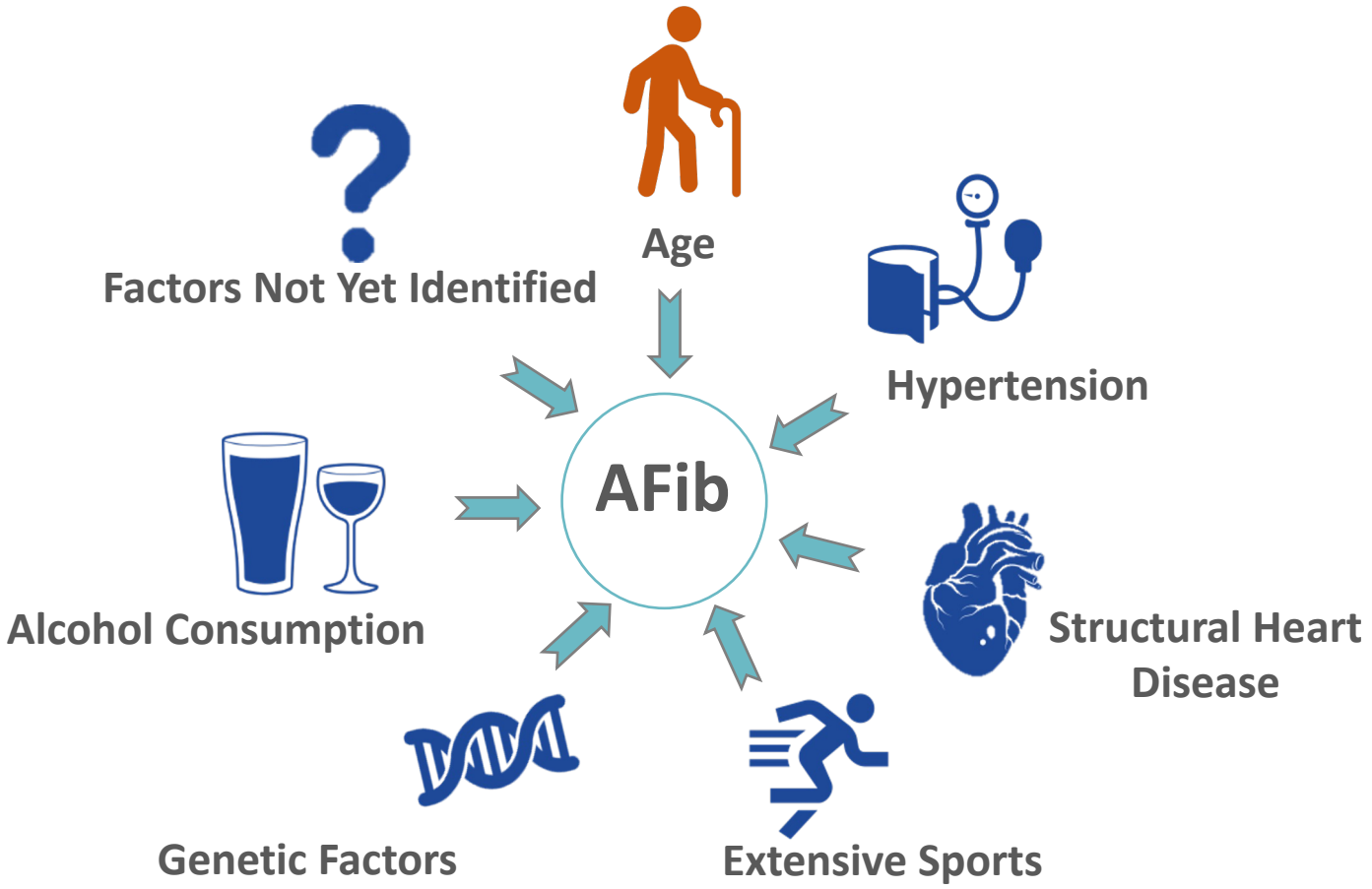
- As you grow older, the risk of AFib increases, especially after age 60.



Signs and Symptoms of AFib

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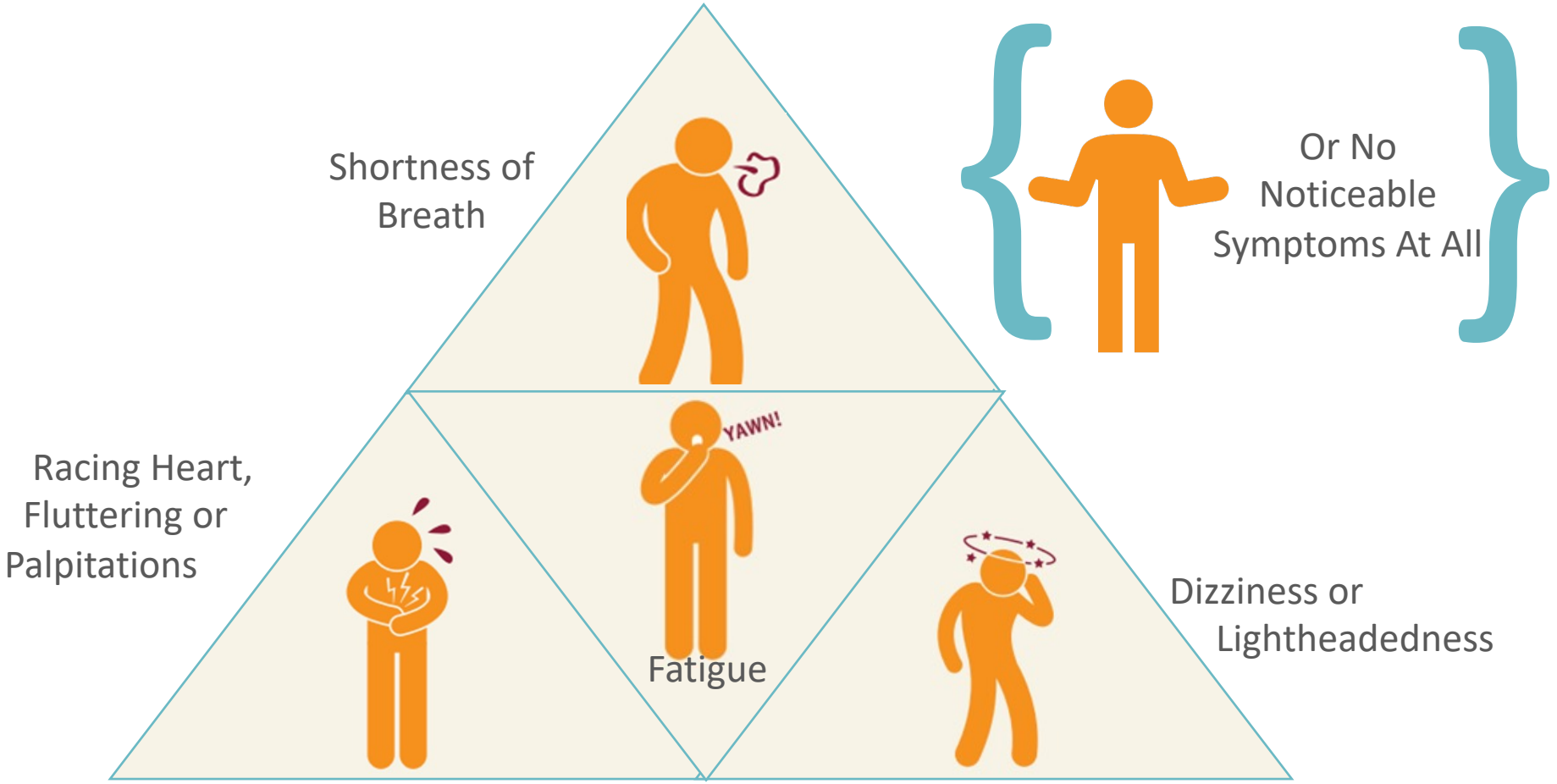

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Atrial Fibrillation & Stroke Risk

Did You Know?

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- People with AFib may be at greater risk for stroke than people with normal heart rhythms[2]

Why AFib Matters

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- AFib can put you at risk for other complications:
  - **Blood Clots:** The irregular heart rhythm can cause blood to pool and form clots in an area of your heart called the Left Atrial Appendage (LAA).
  - **Stroke:** If a blood clot forms in the LAA, it can escape and travel through to the brain and cause a stroke.
  - **Heart Failure:** If atrial fibrillation continues over a long period of time, the decreased efficiency of the heart can lead to heart failure.

AFib Raises Some Risks

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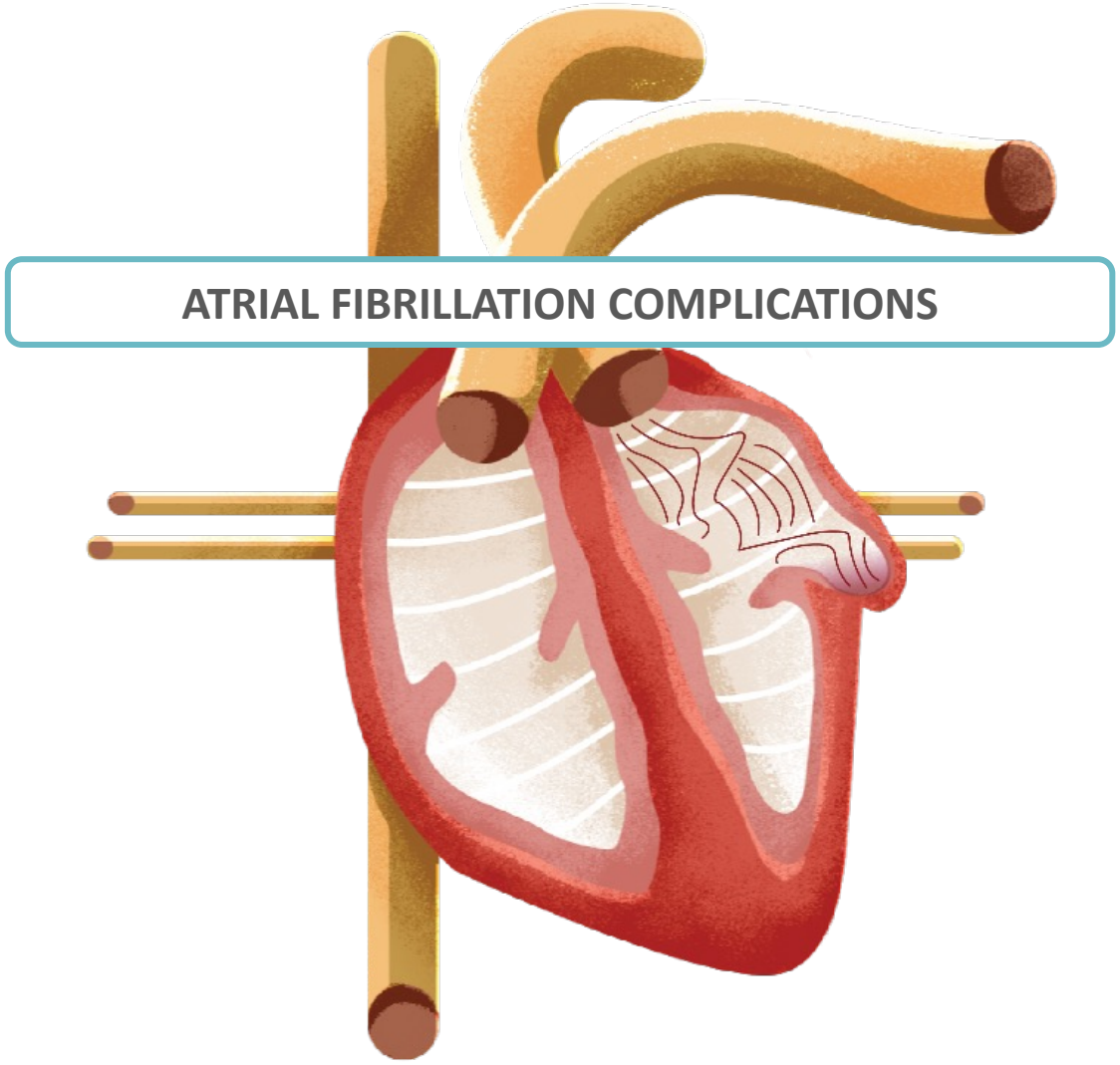

Atrial Fibrillation increases risk of:

- Blood clots
- Stroke
- Heart failure

Blood Clots & Stroke Risk

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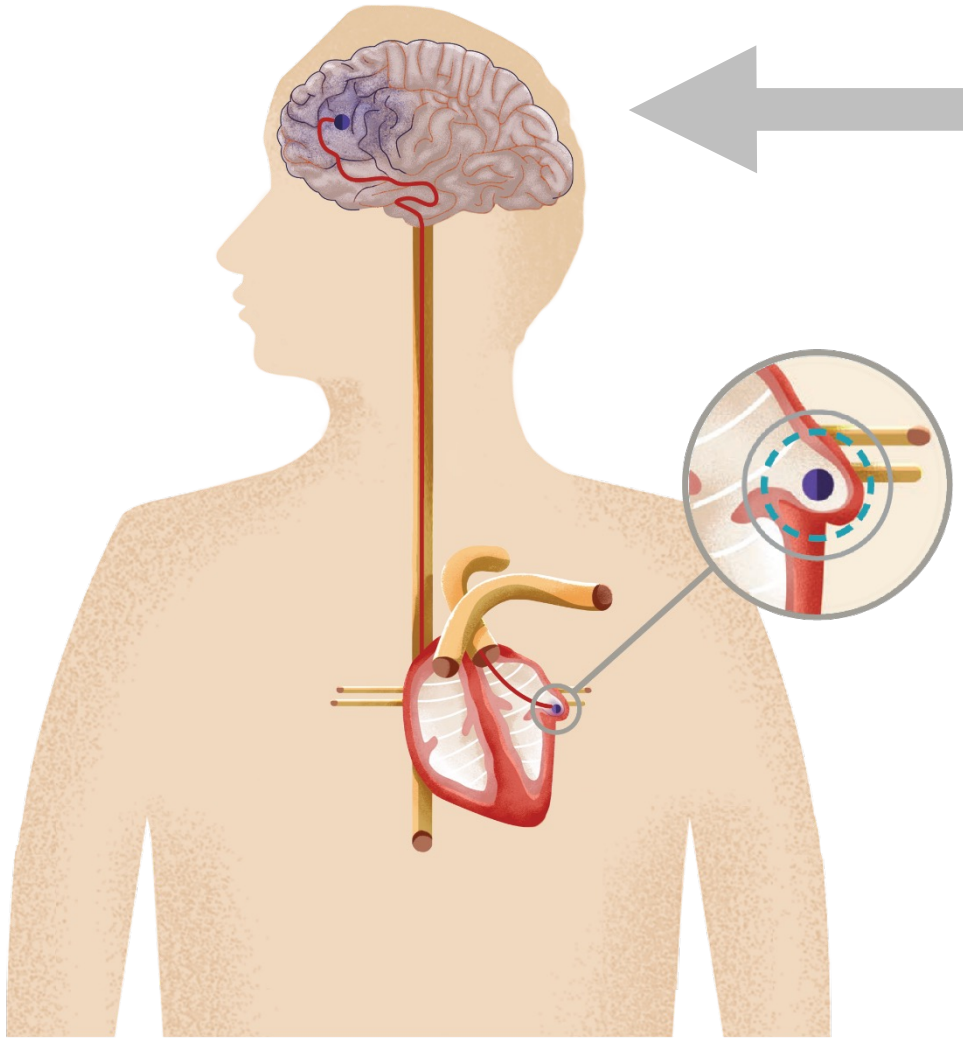

AFib causes blood to pool in the left atrial appendage

The stagnant blood becomes an ideal environment for a blood clot to form

The blood clot dislodges from the LAA and travels through arterial system

The clot lodges itself in the blood vessels of the brain, restricting blood flow and causing a stroke

Did You Know?

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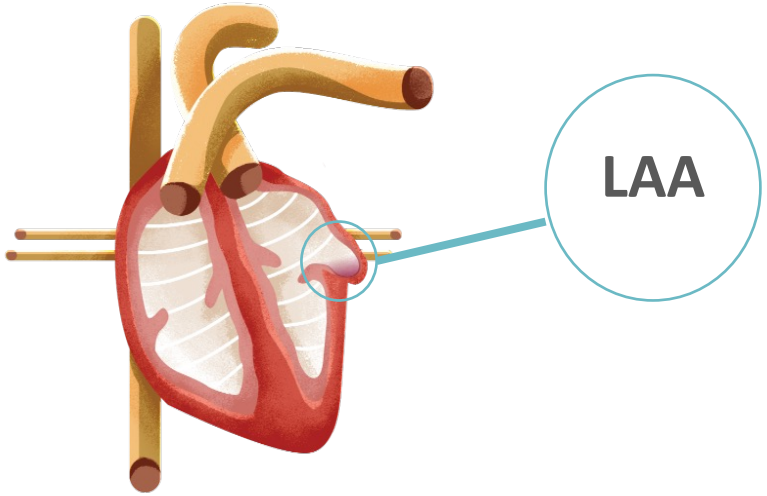
- Approximately **1 in 3** people with atrial fibrillation will have a stroke in his or her lifetime[3]
- More than **90%** of stroke-causing clots that come from the heart originate in the left atrial appendage (LAA)



- AFib-related strokes are more frequently fatal and disabling[4,5]

Symptoms of a Stroke

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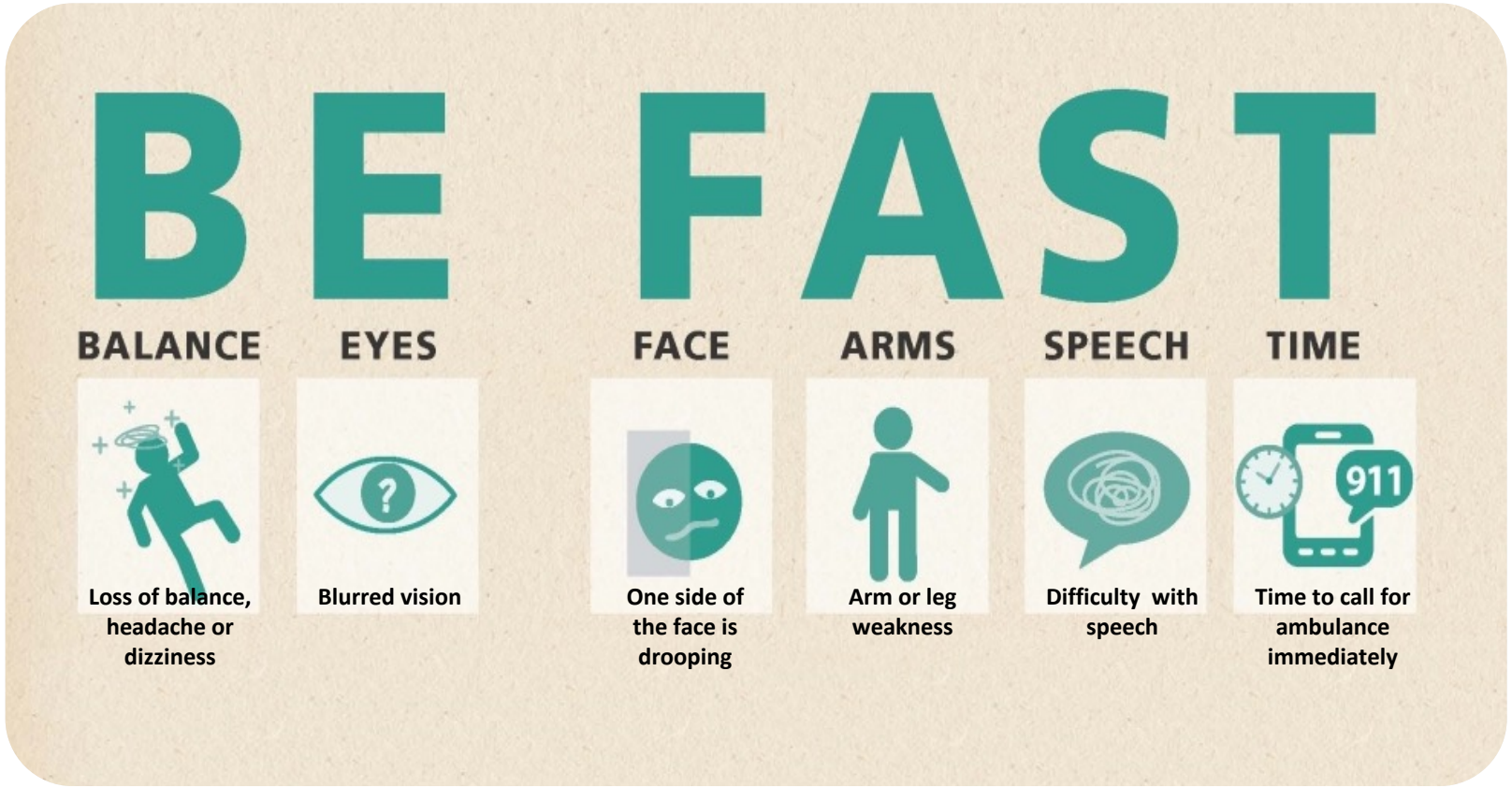
- Learn the warning signs and act FAST



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Treatment Options

Goals of Treatment

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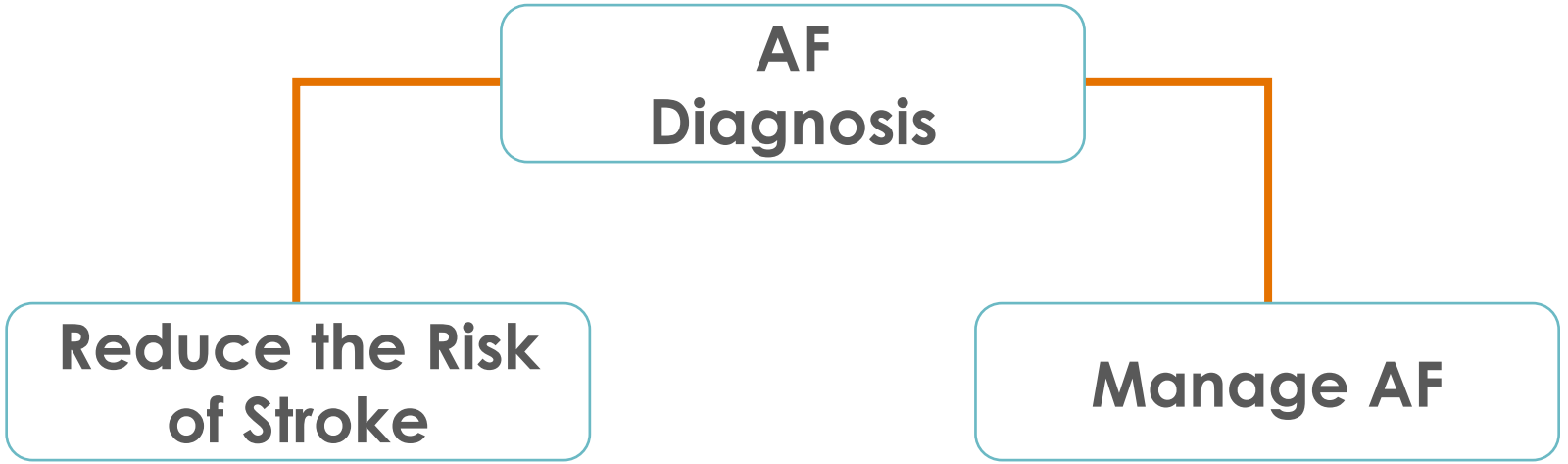

- Oral Anticoagulant Medications
- Left Atrial Appendage Closure

- Medications for Rhythm & Rate
- Procedures to Eliminate AFib
- Lifestyle Changes

How is AFib Managed?

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Rate Control

- Treatment to make sure the heart doesn't beat too quickly during AFib

Rhythm Control

- Treatment to restore the heart's rhythm to a normal state and keep it there

Lifestyle Changes

- Get regular exercise, eat a heart-healthy diet, don't smoke, watch alcohol and caffeine intake

Atrial Fibrillation Procedures

- Cardioversion or Ablation procedures to restore rhythm

Validated Scoring Systems to Assess Stroke Risks

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CHA_2DS_2VASc Score (Stroke Risk)[3]

	Condition	Points
C	Congestive heart failure	1
H	Hypertension (SBP>160)	1
A_2	Age ≥ 75 years	2
D	Diabetes mellitus	1
S_2	Prior stroke, TIA or thromboembolism	2
V	Vascular disease (PAD, MI)	1
A	Age 65-74 years	1
Sc	Sex category (Female)	1
	TOTAL POINTS	

Score	Yearly Stroke Risk (%)		
	No Warfarin	With Aspirin[2]	With Warfarin[2]
0	0	0	0
1	1.3	1.0	0.5
2	2.2	1.8	0.8
3	3.2	2.6	1.1
4	4.0	3.2	1.4
5	6.7	5.4	2.3
6	9.8	7.8	3.4

3. *Chest*. 2010 Feb;137(2):263-72.

Validated Scoring Systems to Assess Bleeding Risks

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HAS-BLED Score (Bleeding risk with warfarin)[4]

	Condition	Points
H	Hypertension	1
A	Abnormal renal/liver function (1 pt each)	1 or 2
S	Hemorrhagic Stroke	1
B	Bleeding history or disposition	1
L	Labile INRs	1
E	Elderly	1
D	Current drugs (medication) or alcohol use (1pt each)	1 or 2
	TOTAL POINTS	

Score	Yearly Major Bleeding Risk %
0	1.13
1	1.02
2	1.88
3	3.74
4	8.70
5+	Not well validated

4. *Chest*. 2010 Nov;138(5):1093-100.

Reducing the Risk of AFib-Related Stroke

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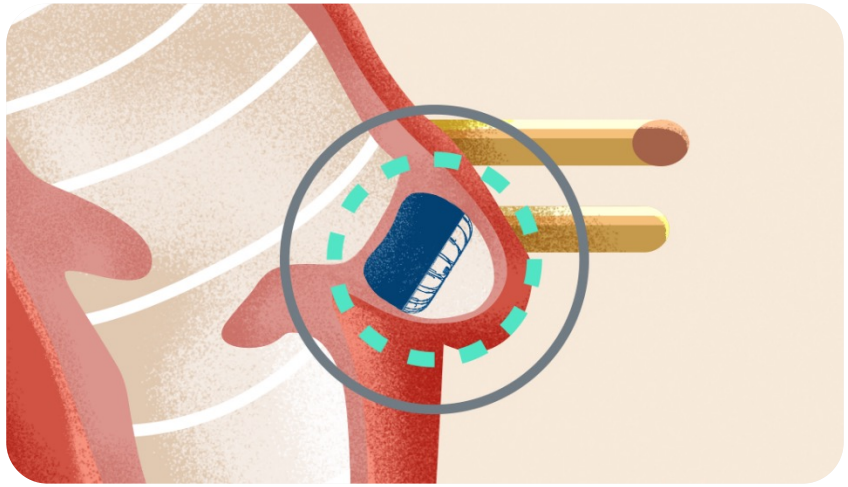
- Treatment options are available to protect you from stroke or related complications from blood clots

- **Oral Anticoagulation Medicine (Blood Thinners)**

- **Left Atrial Appendage Closure (LAAC) Devices**



Oral Anticoagulant Medications (Blood Thinners)

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- Medications can reduce the risk of blood clots that could lead to stroke
  - **Anti-platelet medicines**, including aspirin, keep platelets in the blood from sticking together and forming clots.
  - **Anti-clotting medicines**, such as warfarin (Coumadin®), also help prevent clots from forming in your blood.

Oral Anticoagulant Medications (Blood Thinners)

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- **Common blood thinners include:**
  - Warfarin (Coumadin®)
  - Eliquis®
  - Pradaxa®
  - Xarelto®
  - Savaysa®

- Most people can take blood thinners for years without serious side effects
- Current treatments with warfarin or NOACS are effective, but many patients stop taking the medications
- ~1 in 4 patients discontinue blood thinners after 2 years
- Anti-coagulation bleeding risk compounds over time; may not be viable as a long-term solution for some patients
- But because blood thinners help prevent clots by thinning the blood, they also increase the risk of bleeding

Talk to Your Doctor

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- When considering your treatment options, your cardiologist will weigh your risk of a stroke against your risk of a serious bleeding problem.

Risk of a stroke

Risk of a serious bleed

Left Atrial Appendage Closure

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- Closing the Left Atrial Appendage (LAA) is an effective way to reduce stroke risk in people with AFib not caused by heart valve problems.

- A Left Atrial Appendage Closure (LAAC) Implant is a permanent implant designed to close off the LAA so blood clots can't form there and escape to cause a stroke.

Left Atrial Appendage Closure Implants

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- LAAC Implants require a one-time, minimally invasive procedure that may reduce stroke risk for a lifetime.
- They are an effective stroke risk alternative to blood thinners.
- LAAC Implants reduce stroke risk without the worries that come with a lifetime of blood thinners.
- The WATCHMAN™ Left Atrial Appendage Closure Implant is about the size of a quarter and made from very light and compact materials commonly used in many other medical implants.

The Watchman™ Implant Clinical Evidence

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In a clinical trial,

96% of people were able to stop taking blood thinners

just 45 days after getting the WATCHMAN Implant[6]

The WATCHMAN™ Implant Procedure

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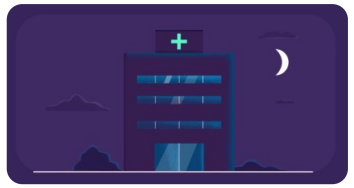
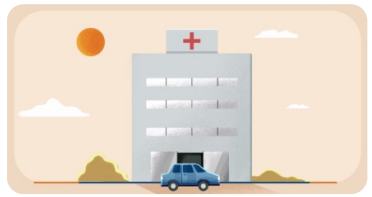
- The WATCHMAN™ Implant is safe and minimally invasive. It does not require open heart surgery and cannot be seen outside the body.
- The procedure is typically done under general anesthesia.
- Typically takes less than an hour.

People commonly stay in the hospital overnight and leave the next day.





THE WATCHMAN™ Implant Procedure

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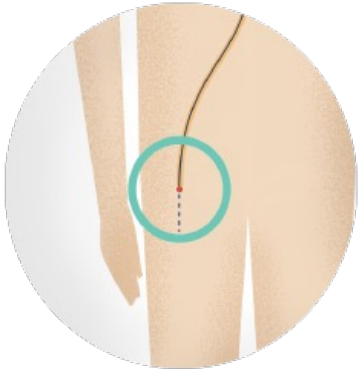

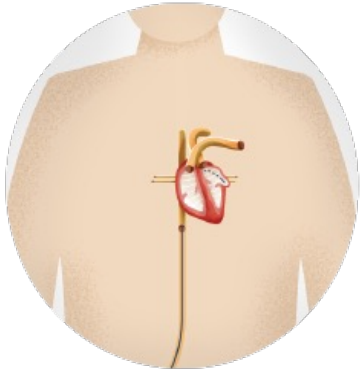

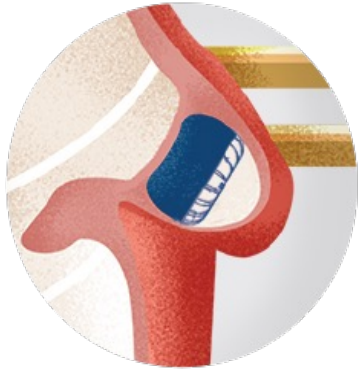

1.
To place the WATCHMAN Implant, your doctor makes a small cut in your upper leg and inserts a narrow tube.

2.
Your doctor then guides the WATCHMAN Implant through the tube, into your LAA.

3.
The procedure is done under general anesthesia and typically takes about an hour.

People who get the WATCHMAN Implant usually stay in the hospital overnight and go home the next day.

4.
After the procedure, you'll take blood thinners until your LAA is permanently closed off – usually just 45 days.

5.
During that time, heart tissue grows over the WATCHMAN Implant to form a barrier against blood clots.

THE WATCHMAN™ Implant Procedure

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- As with any medical procedure, there are risks involved with the WATCHMAN™ Implant.

- See the Important Safety Information for a list of possible complications, and talk to your doctor so you thoroughly understand all the benefits and risks of the WATCHMAN™ Implant.

See How the WATCHMAN™ Implant Works

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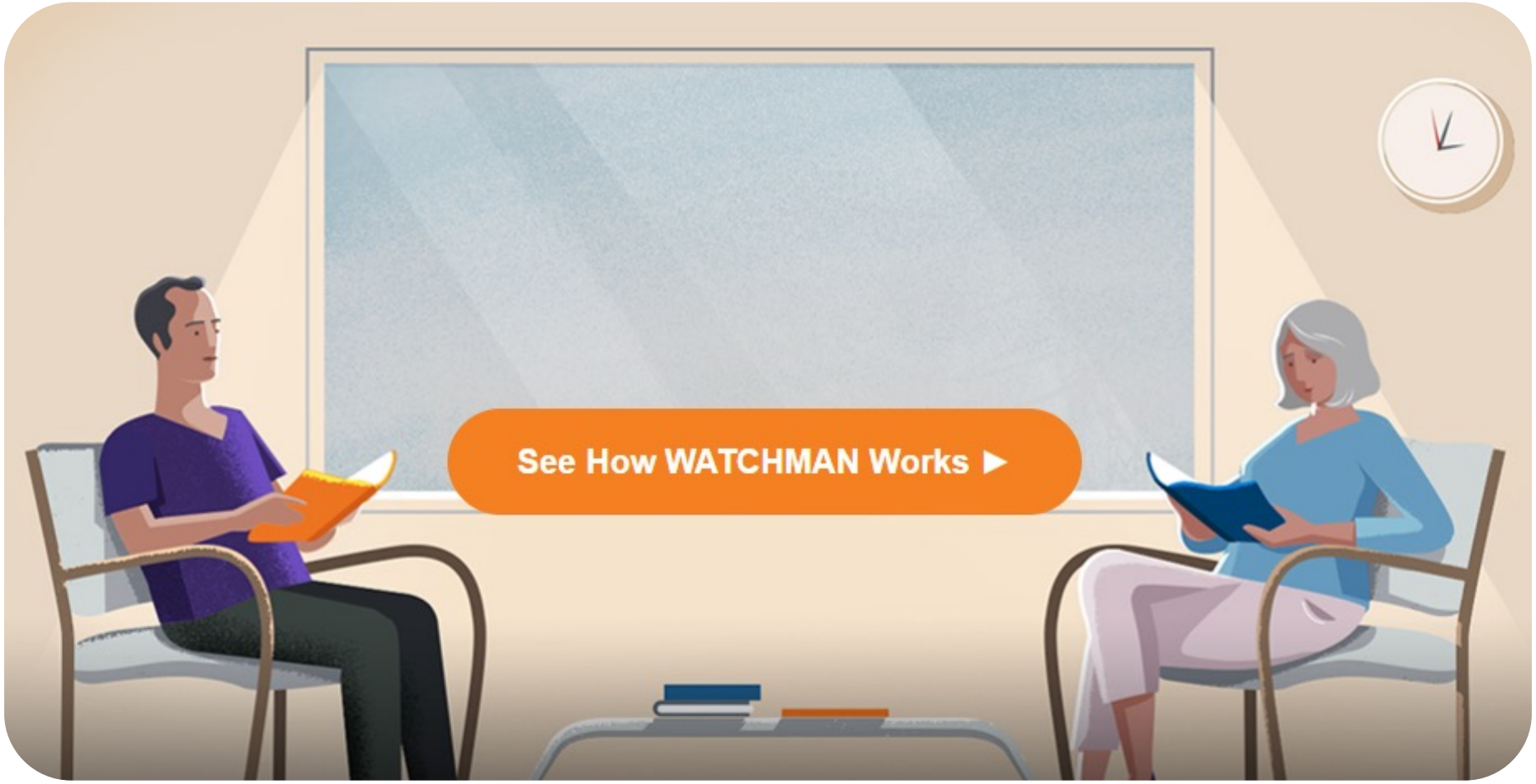

Studied for More Than 20 Years

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- The WATCHMAN™ Implant is an **FDA-approved implant** proven to safely and effectively lower stroke risk in patients with AFib not caused by heart valve problems.

FDA APPROVED

A Long and Proven Safety Record

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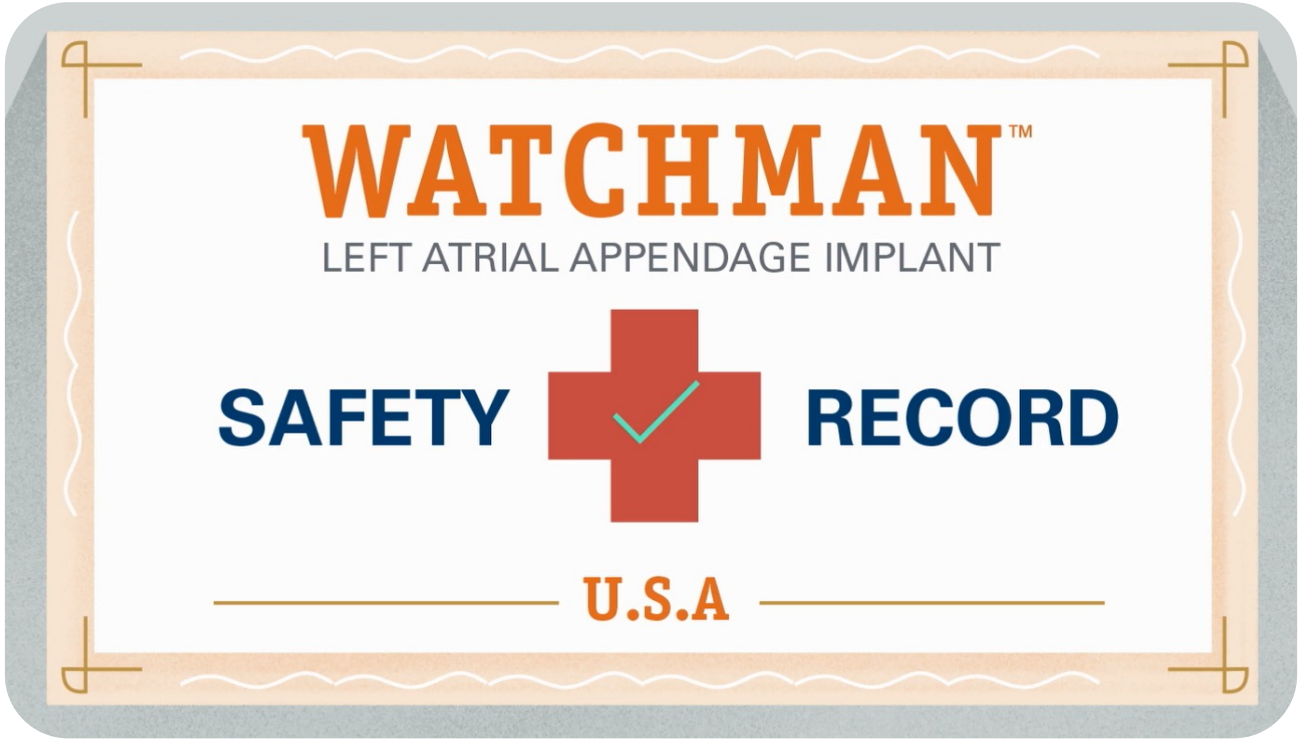
Worldwide, **more than 200,000 people** have received the WATCHMAN™ Implant and is the most implanted LAAC device in the United States.



WATCHMAN is the most studied LAAC Device - Most patients and only one with long-term clinical data

Key Trials	N	Highlights
PROTECT AF[1] (2005-2008)	707	Prospective, randomized 2:1, non-inferiority trial of LAA closure vs. warfarin.
CAP[2] (2008-2010)	566	Prospective registry allowing continued access to the WATCHMAN Device and gain further information prior to PMA approval.
PREVAIL[3] (2010-2012)	407	Prospective, randomized 2:1, non-inferiority trial to collect additional information on the WATCHMAN Device.
CAP2 (2012-2014)	579	Prospective registry allowing continued access to the WATCHMAN Device prior to PMA approval.
Total patients	>2,000	~6,000 Patient-Years of Follow-up

1 Reddy, et al. JAMA. 2014 ;312(19): 1988-1998.; 2 Reddy VY et al. Circulation. 2011; 123:417-424.
3 Holmes et al., JACC 2014,;4(1): 1-11.

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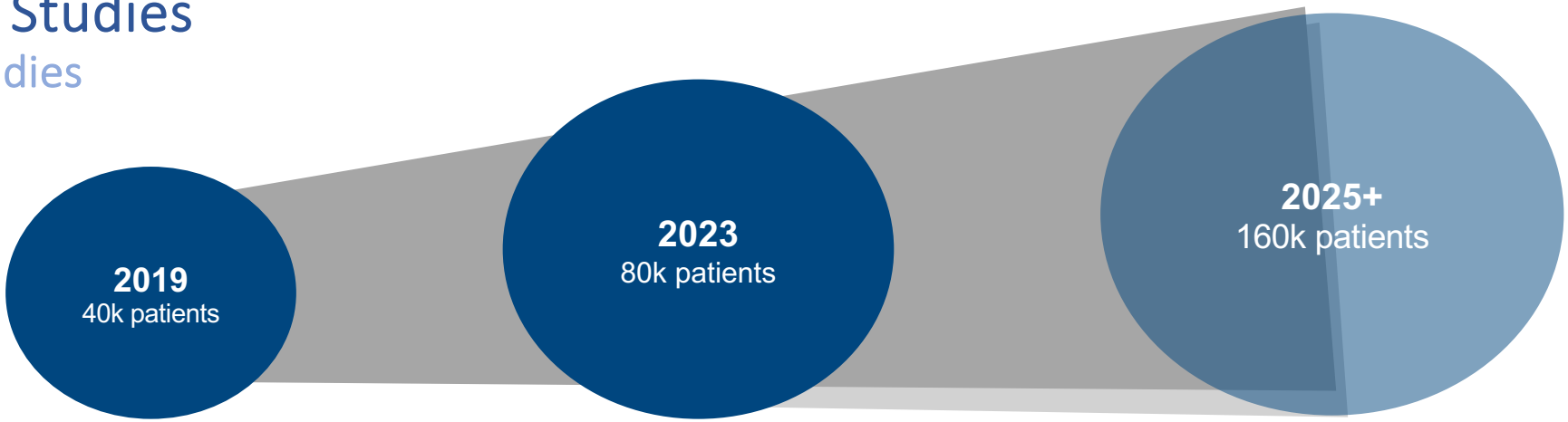
Key Ongoing Studies

WATCHMAN Studies



Label and new product development

NESTed DAPT
Analysis from the NCDR LAAO registry to evaluate the safety & efficacy outcomes associated with a DAPT post-implant medication regimen

PINNACLE FLX
US-only IDE to evaluate the safety and efficacy of the WATCHMAN FLX Device

Penetration Into high-bleed risk population

ASAP-TOO
WM vs antiplatelet therapy in NVAF patients who cannot take oral anticoagulation even for a short period of time

Penetration Into low-to-moderate-bleed risk population

OPTION
RCT comparing the safety and effectiveness of LAAC to OAC for stroke protection post-ablation in NVAF patients

CHAMPION-AF
Head to head RCT comparing the safety and effectiveness of LAAC to DOAC for stroke protection in a broader NVAF patients

Who is the WATCHMAN™ Implant For?

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The WATCHMAN Implant may be right for you if:

- ✓ You have Atrial Fibrillation not caused by heart valve problem (NVAF)

And

- ✓ You've experienced bleeding while taking blood thinners

Or

- ✓ You have a lifestyle, job or health condition that puts you at risk for bleeding

Who Should NOT be Considered

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People who SHOULD NOT receive the WATCHMAN™ Implant include, but are not limited to, those who:

- Cannot take oral anticoagulants, aspirin or clopidogrel (Plavix®)
- Should not or cannot undergo heart catheterization procedures
- Have an allergy or sensitivity to nitinol (nickel and titanium)
- Have a left atrial appendage that does not fit the WATCHMAN™ Implant
- Are taking blood thinners for a condition other than atrial fibrillation

Costs and Coverage

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- The WATCHMAN™ Implant is covered for eligible Medicare patients who meet certain national coverage criteria.
- It is also covered by an increasing number of commercial insurers.
- While blood thinners must be taken every day for life and represents an ongoing cost, the WATCHMAN™ Implant is a one-time procedure and one-time cost. This means the WATCHMAN™ Implant can save you money over time.

PFO Associated CVA

Patent Foramen Ovale (PFO)

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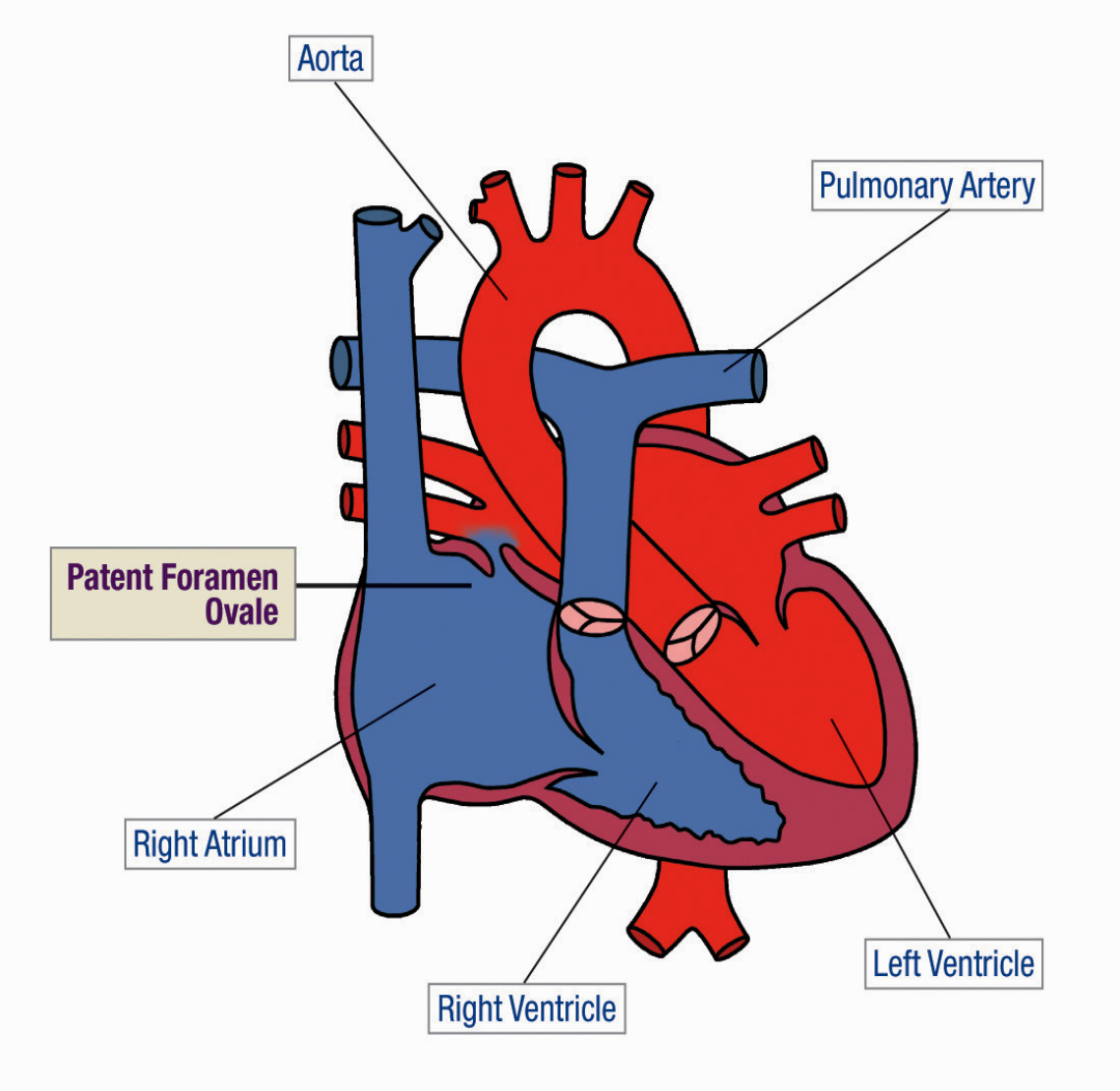
- Persistent flap-like opening: atrial septum primum and secundum
- In utero, physiologic right-to-left shunting
- After birth, increased left atrial blood flow and pressure closes flap
- Anatomical closure follows



Types of Strokes

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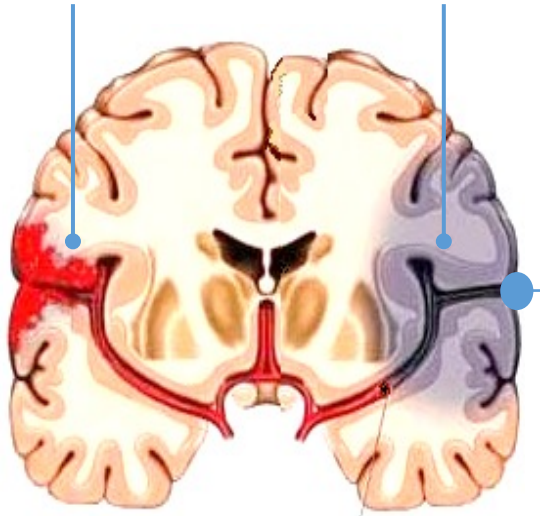
VESSEL RUPTURE
15%

ARTERY OCCLUSION
85%



15-20% ATHEROTHROMBOTIC
Stenotic artery feeding area of infarction

25-30% CARDIOEMBOLIC
A thrombus or other material dislodges from the heart of aortic arch

15-20% LACUNAR/SMALL VESSEL

25-30% CRYPTOGENIC
Unknown cause

5-10% "OTHER"

Sources: Petty, et al. Ischemic Stroke Subtypes: A population-based study of incidence and risk factors. Stroke 1999; 30:2513–2516; American Stroke Association, Understanding Diagnosis and Treatment of Cryptogenic Stroke: A Healthcare Professional Guide, 2015.

See Important Safety Information referenced within.

POINTS

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- Stroke is a major cause of death among adults in the United States and a major contributor to long-term functional impairment and disability.

- The majority of strokes are ischemic. Of these, about 25-40% do not have identifiable cause after thorough evaluation and are designated as cryptogenic (CS).

- A patent foramen ovale (PFO) is a remnant of the fetal circulation and has been identified at autopsy in 27% of patients with normal hearts.

Presumed Mechanism of Stroke with PFO

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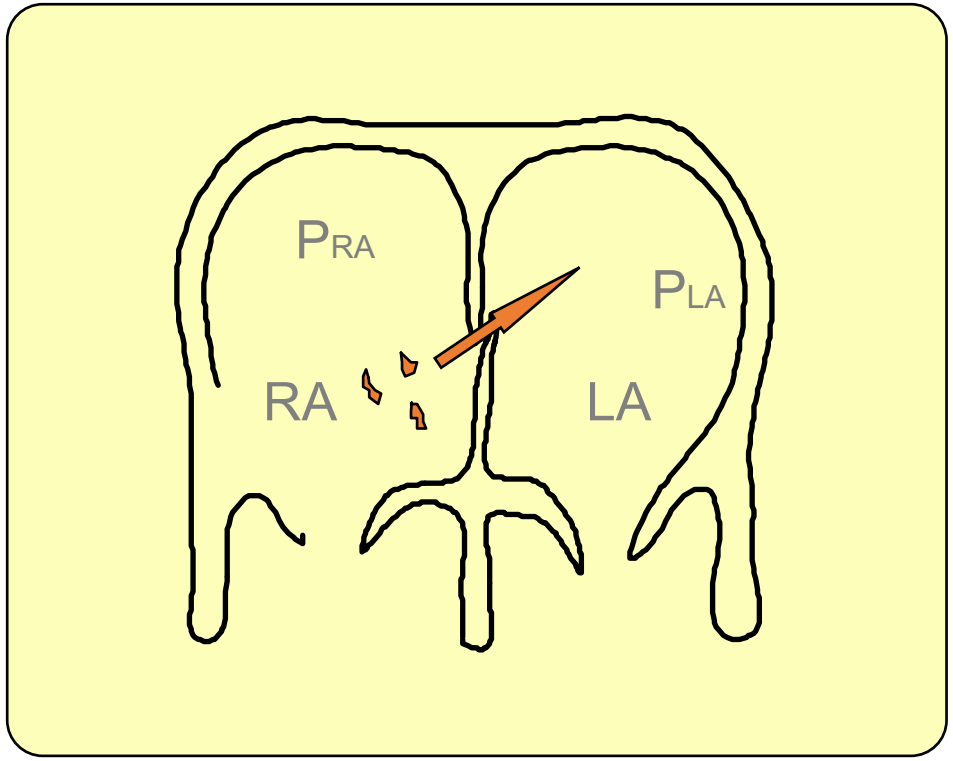
Pressure in RA > Pressure in LA:

- Early systole
- Valsalva
- Coughing
- Pulmonary hypertension
- COPD
- Pregnancy
- Asthmatics
- Wind instruments
- Decompression sickness (diving)
- High altitude flying
- Obstructive sleep patterns



Sources of Cardiogenic Emboli

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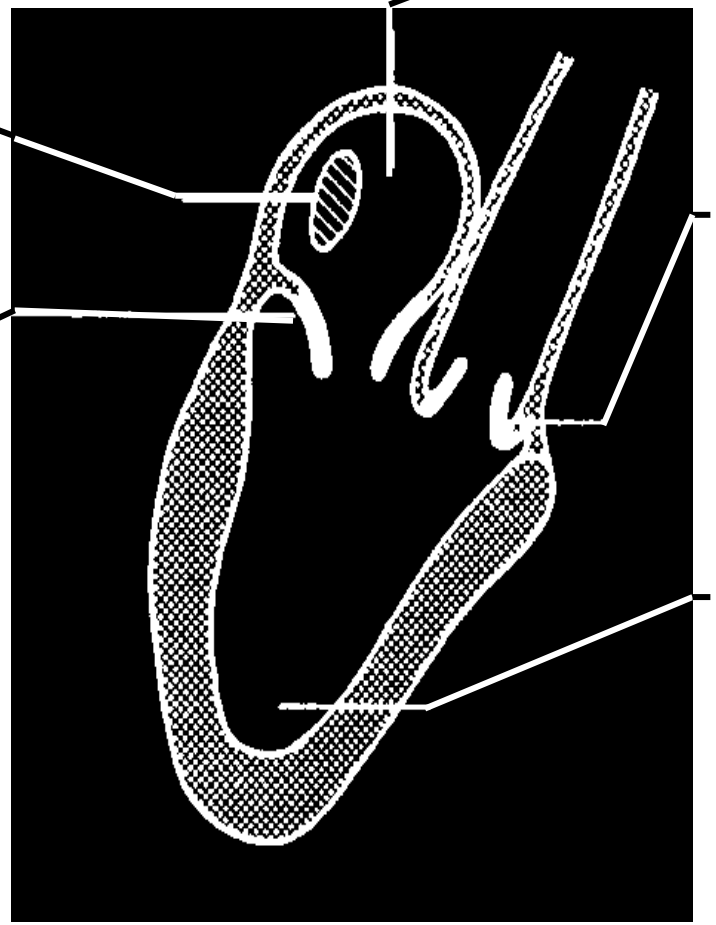
Paradoxical Emboli

- Patent foramen ovale
- Atrial septal defect

Mitral Valve

- Infective endocarditis
- Non-bacterial endocarditis
- Myxomatous valvulopathy
- Prosthetic valves
- Vegetations due to prothrombotic states



Left Atrium

- Atrial fibrillation
- Myxoma
- Atrial septal aneurysm

Aortic Valve

- Calcific stenosis
- Infective endocarditis
- Prosthetic valve

Left Ventricle

- Ischemic dyskinesis
- Cardiomyopathy
- Thrombi due to prothrombotic states

PFO-Associated Stroke

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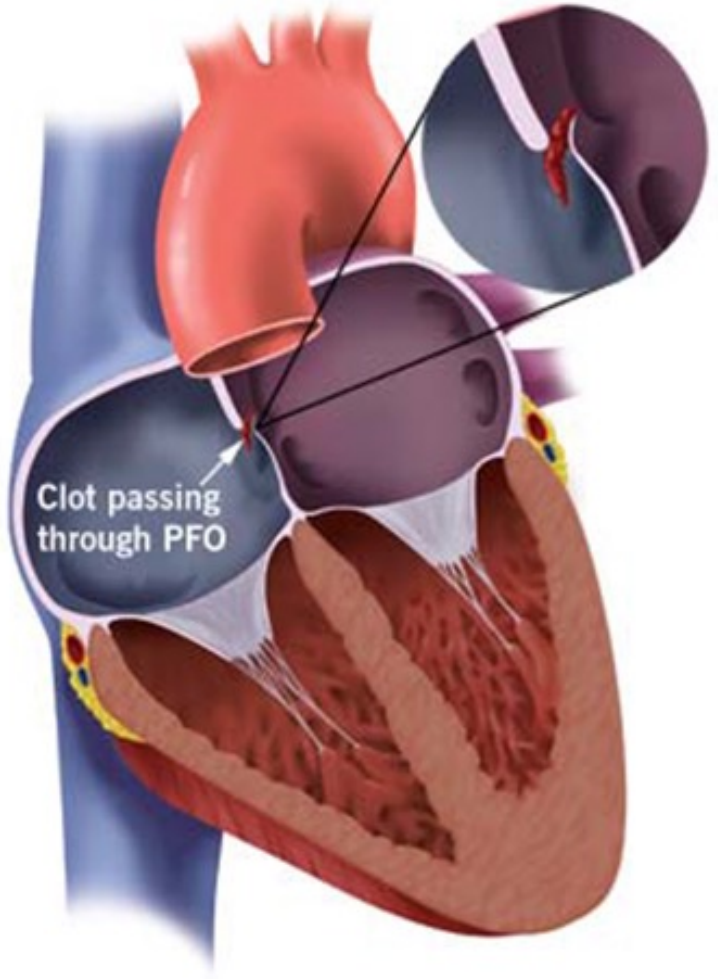
- Some patients with PFO experience a stroke at a young age.
- PFO can allow clots to go from the right side of the heart to the left, travel to the brain and cause a stroke.
- Mechanism is presumed to be paradoxical embolism
  - Venous thrombus crosses the PFO and then occludes a systemic artery



Source: American Stroke Association, 2019 Updated Healthcare Professional Guide: Understanding Diagnosis and Treatment of Cryptogenic Stroke. www.strokeassociation.org

U.S. PFO Incidence

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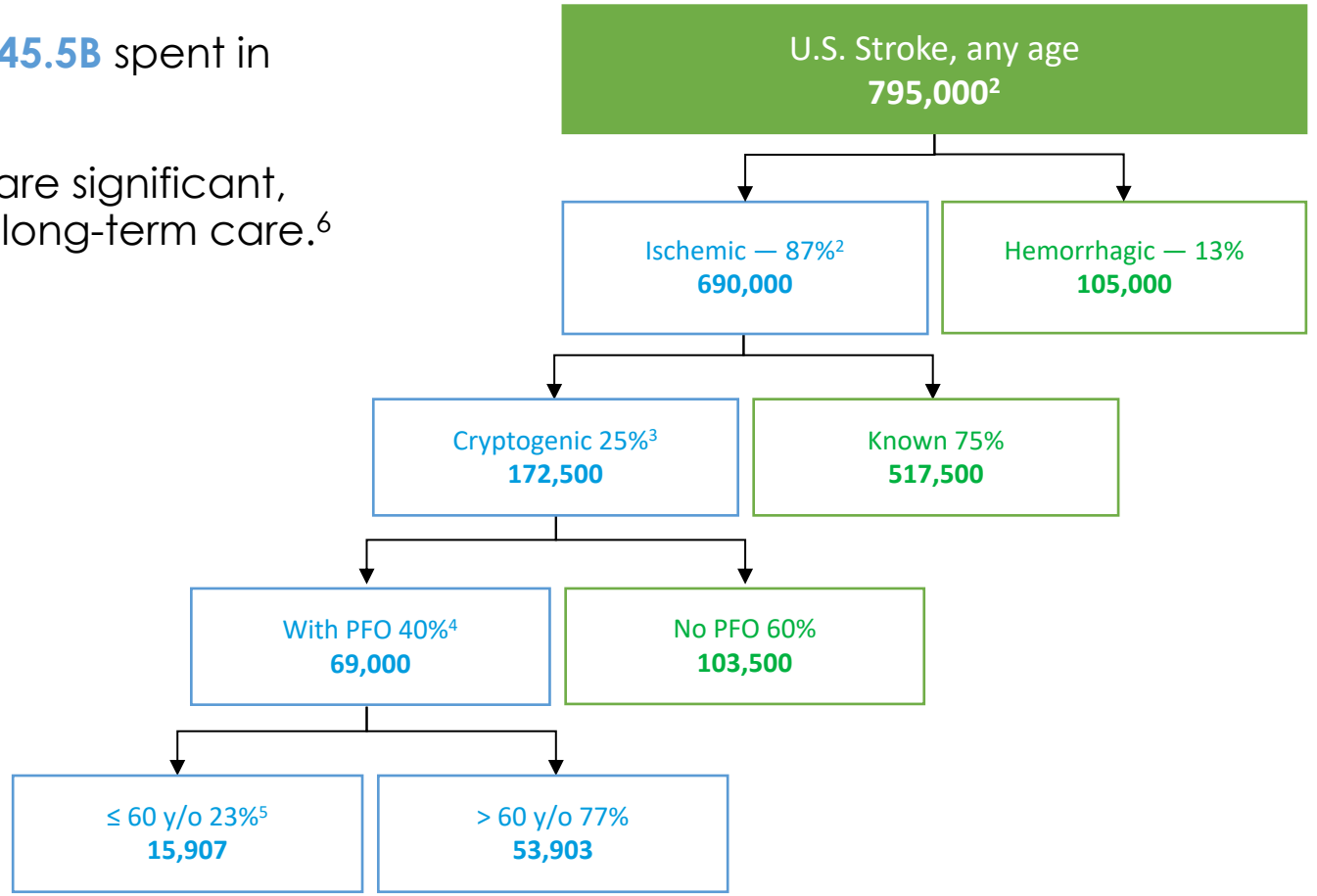
Cost of stroke is significant, with over **$45.5B** spent in the U.S. in 2014-15.[1]

Cost implications with young patients are significant, based on the loss of productivity and long-term care.[6]



1. Roger et. al. Circulation 2014:129(3): e28-e292.
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5. Fonarow, G. C., Reeves, M. J., Zhao, X., Olson, D. M., Smith, E. E., Saver, J. L., & Schwamm, L. H. (2010). Age-related differences in characteristics, performance measures, treatment trends, and outcomes in patients with ischemic stroke. Circulation, 121, 879-891.
6. Mozaffarian, D., et al. (2015). Heart disease and stroke statistics-2015 update: A report from the American Heart Association. Circulation, 131(4), e180, e189.

Practice Advisory/Guidelines for PFO Management

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2 updates in 2 years

2020 AAN RECOMMENDATIONS:

- Patients undergo thorough stroke evaluation
- PFO closure for patients 18-60 with PFO and no alternative stroke mechanism
- Shared decision-making process with physicians with expertise in stroke, PFO closure, and the patient

2021 AHA/ASA RECOMMENDATIONS:

- Moderate recommendation in favor of PFO closure for patients with a PFO that has high-risk anatomical features
- Strong recommendation that the decision about PFO closure should be made jointly by the patient, a cardiologist, and a neurologist
- For PFO considered low risk anatomically, it's important to consider other clinical features (RoPE Score).

Practice Advisory/Guidelines for PFO Management

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3 updates in 3 years

2020 AAN Recommendations	2021 AHA/ASA Recommendations	2022 SCAI Panel Recommendations
Patients undergo thorough stroke evaluation, shared decision-making with heart/brain teams and patients		
For patients younger than 60 with a PFO and embolic-appearing infarct and no other mechanism of stroke identified, clinicians may recommend closure following discussion of potential benefits and risks Level C = Possibly effective, ineffective or harmful for the given condition in the specified population	In patients 18-60 with a nonlacunar ischemic stroke of undetermined cause despite a thorough evaluation and a PFO with **high-risk anatomic features**, it is reasonable to choose closure and long-term antiplatelet therapy over antiplatelet therapy alone 2a recommendation = Moderate	In patients 18-60 with a prior PFO-associated stroke, SCAI guideline panel recommends PFO closure rather than antiplatelet therapy alone, **independent of patient anatomy** Strong recommendation

Strength of recommendation for PFO closure increases over time

See Important Safety Information referenced within.

Stroke Work-up

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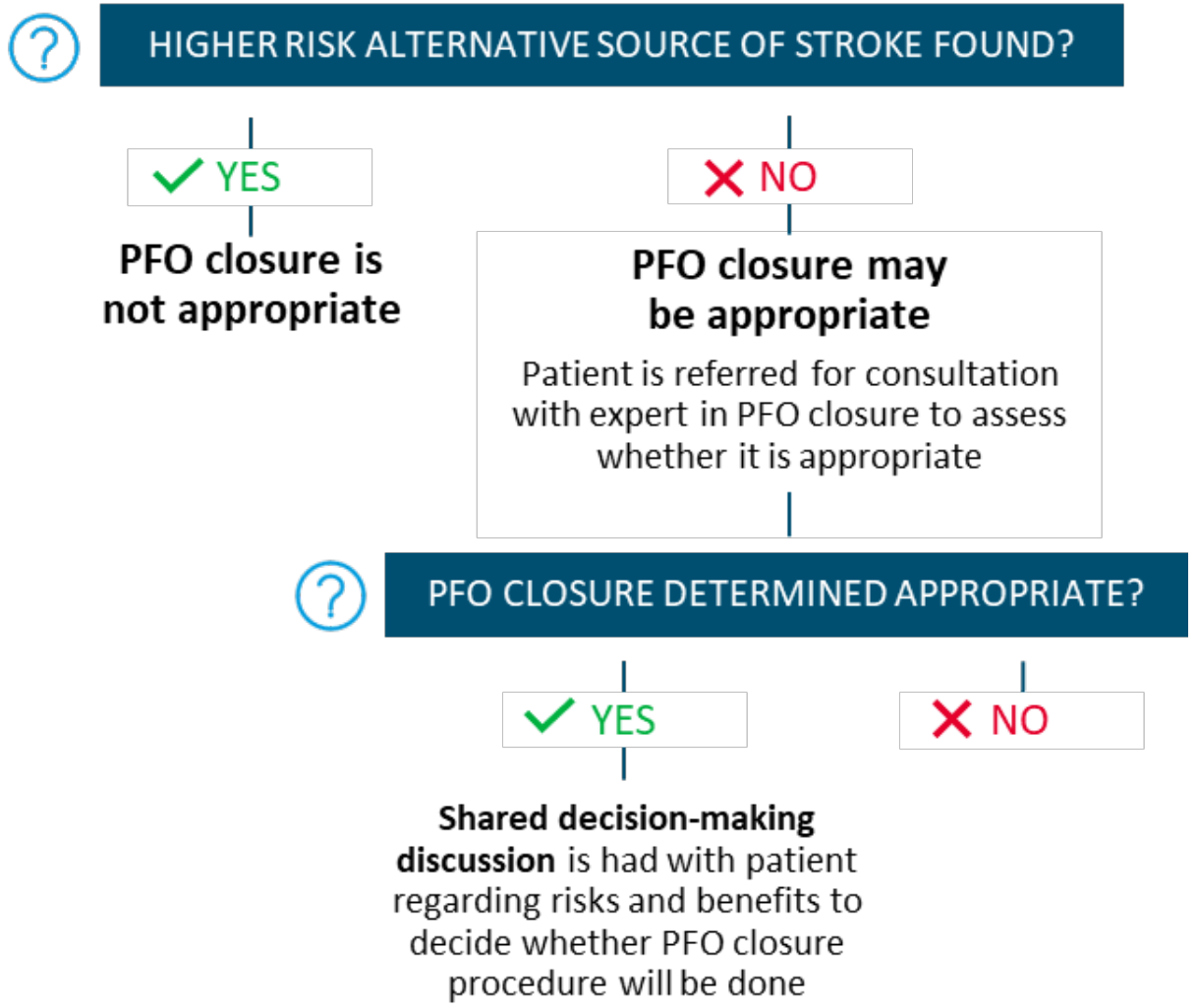
Before undergoing PFO closure, patients should be assessed by a clinician with expertise in stroke to ensure that the PFO is the most plausible mechanism of stroke.

A COMPLETE, THOROUGH STROKE WORKUP TO RULE OUT ALTERNATIVE SOURCES OF STROKE IS RECOMMENDED:

- Brain imaging (MRI/MRA or CTA)
- 4 weeks of heart monitoring
  - If select patients at risk for AF, occasionally receive prolonged cardiac monitoring for 3-6 months
- TTE (initial screen) with bubble study followed by TEE assessment of the anatomical details of atrial septum and to confirm atrial level shunting
- Hypercoagulability testing



Sources: Messé et al, Practice advisory update summary: Patent foramen ovale and secondary stroke prevention. Report of the Guideline Subcommittee of the American Academy of Neurology, Neurology, 2020;94:1-10.

See Important Safety Information referenced within.

Identifying Stroke-related PFO—RoPE Score

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GOAL OF RoPE SCORE:

Identify patients with cryptogenic stroke with a PFO that are more likely to be associated with paradoxical emboli

- Helps identify a group of patients who are more likely to benefit from PFO closure
- This is similar to CHA2DS2-VASc and HAS-BLED scores for determining antithrombotic treatment in patients with atrial fibrillation
- RoPE score is used to determine probability of PFO-related stroke and should not be used to determine the appropriateness of closure

RoPE SCORE CALCULATOR		
CHARACTERISTIC	**POINTS**	**SCORE**
No history of hypertension	1	
No history of diabetes	1	
No history of stroke or TIA	1	
Non-smoker	1	
Cortical infarct on imaging	1	
AGE (YEARS)		
18-29	5	
30-39	4	
40-49	3	
50-59	2	
60-69	1	
≥ 70	0	
TOTAL SCORE (sum of individual points)		
Maximum score (patient < 30 y.o. without vascular risk factors, no history of stroke or TIA, and cortical infarct)		10
Minimum score (patient ≥ 70 y.o. with vascular risk factors, prior stroke, and no cortical infarct)		0

Wiktor D. MD, Carroll J. MD. *The Case for Selective Patent Foramen Ovale Closure After Cryptogenic Stroke*. Mar 16, 2018. Vol. 11 (Iss. 3): Pg 6. doi: 10.1161/CIRCINTERVENTIONS.117.004152.

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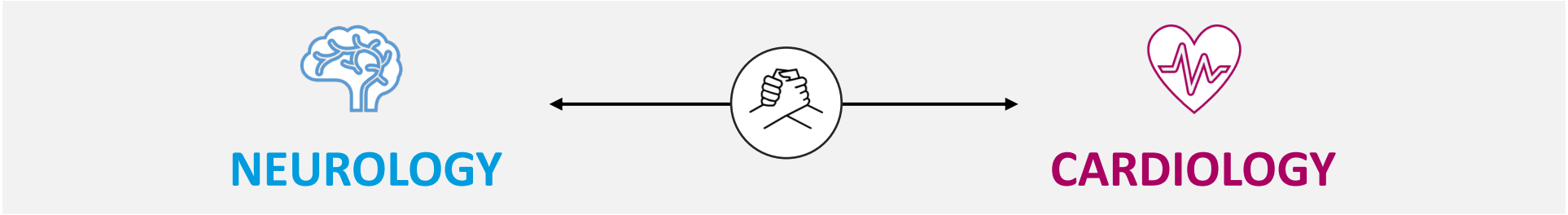
"The Heart-Brain" team is a complimentary collaboration of expertise.



EXPERTS IN:

- Patient evaluation
- Neuroimaging and interpretation
- Stroke etiology
- Stroke management

EXPERTS IN:

- Cardiac imaging and interpretation
- PFO morphology assessment
- PFO closure techniques
- Arrhythmia detection and management

Source: Horlick, E, Kavinsky, CJ, Amin, Z, et al. SCAI expert consensus statement on operator and institutional requirements for PFO closure for secondary prevention of paradoxical embolic stroke. Catheter Cardiovasc Interv. 2019; 93: 859– 874. https://doi.org/10.1002/ccd.28111.

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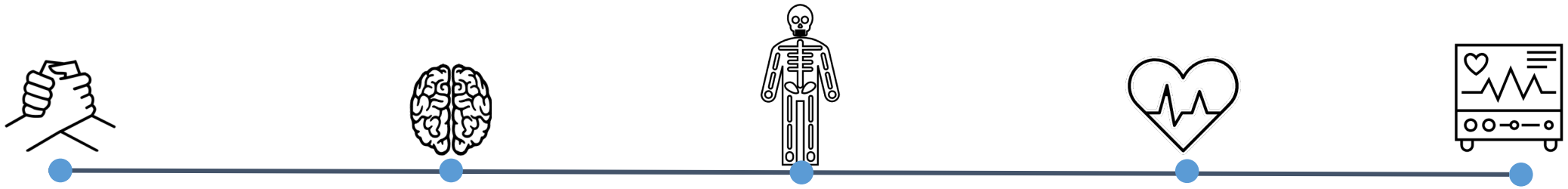
Recommended Patient Evaluation for PFO Closure in Setting of Cryptogenic Stroke:



Neurology and Cardiology Collaboration

MRI

Head and Neck Vascular Imaging (CTA or MRA)

TTE and TEE

Extended Cardiac Monitoring

4 weeks in patients >40 or 1-2 weeks for <40 unless risk factors for atrial fibrillation are present (hypertension, hyperthyroidism, valvular heart disorders or alcohol use)

Source: Horlick, E, Kavinsky, CJ, Amin, Z, et al. SCAI expert consensus statement on operator and institutional requirements for PFO closure for secondary prevention of paradoxical embolic stroke. Catheter Cardiovasc Interv. 2019; 93: 859– 874. https://doi.org/10.1002/ccd.28111.

Heart-Brain Team Facilitates Neurology-Cardiology Teamwork

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PRIOR TO SEEING PATIENT: Review brain imaging and TTE/TEE to **share** key findings with each other.

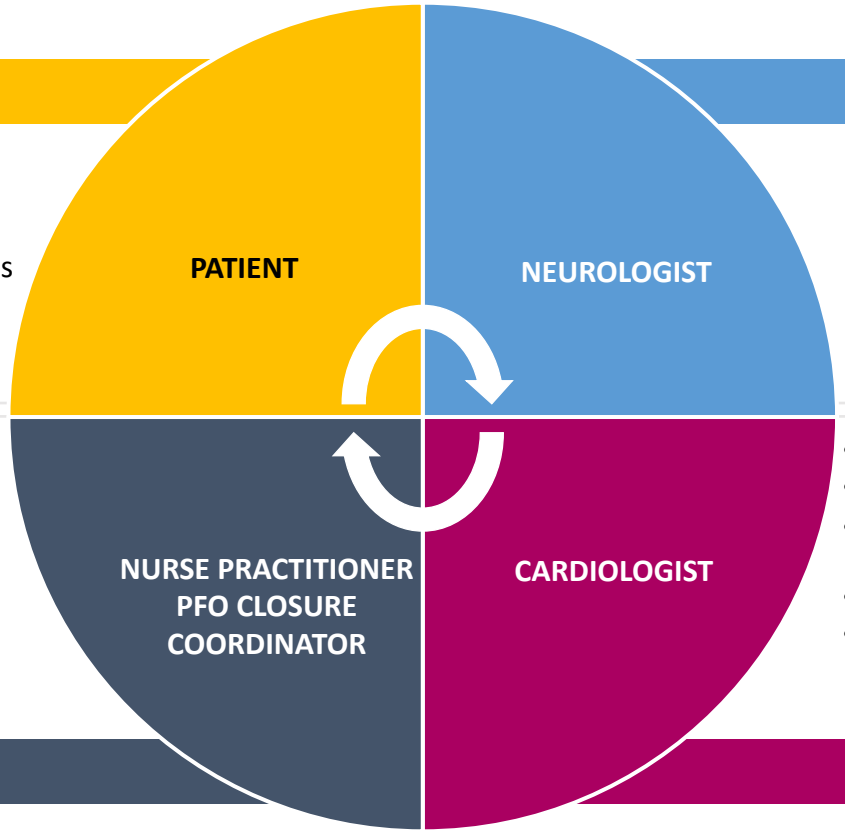
DISCUSSION WITH PATIENT AND FAMILY: *Provide a joint consultation as a multidisciplinary team* with both clinicians providing their assessment, recommendations and answering questions and concerns.

ENGAGE AND EDUCATE PATIENT

- Will they be seeing both a cardiologist and neurologist?
- Recommendations on lifestyle, meds, and diet (scuba diving?)
- What does a PFO closure procedure consist of and what is recovery?

RULE OUT KNOWN CAUSES OF STROKE

- Is evaluation complete?
- Are the imaging data consistent with an embolic mechanism?
- Does the RoPE Score suggest a pathogenic PFO?
- Any hx of VTE, hypercoagulable states?



SUPPORT FROM STAFFING

- Assess patient's understanding of issues and goals of care
- NP: Complete H&P
- RoPE Score calculation
- Distribute and use resources to educate: patient guide, demo of Amplatzer™ PFO Occluder, and procedure animation video

CARDIAC EVALUATION & PROCEDURE PLANNING

- Any other cardiac issues present? Has PAF been excluded?
- What are the characteristics of PFO?
- Presence of other PFO related syndromes: Hypoxemia and migraines?
- Discussion of PFO closure
- Reviews hypercoagulable blood tests to ensure patient does not need chronic oral anticoagulation and/or further hematology evaluation

Wiktor D. MD, Carroll J. MD. *The Case for Selective Patent Foramen Ovale Closure After Cryptogenic Stroke*. Mar 16, 2018. Vol. 11 (Iss. 3): Pg 8. doi: 10.1161/CIRCINTERVENTIONS.117.004152.

Amplatzer™ Talisman™ PFO Occluder

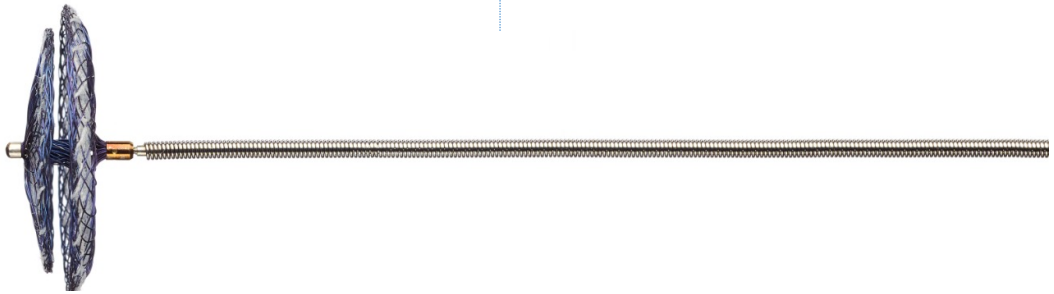
Boulder Community Health

DEVICE DESCRIPTION

- Self-expandable double disc device lined with thin polyester fabric and linked together by a short connecting waist
- Nitinol wire mesh
- Pre-attached to delivery cable
- Recapturable, repositionable
- Distal and proximal radiopaque marker bands
- MR conditional
- End screw to facilitate optimal handling

STATUS PRIOR TO AMPLATZER TALISMAN LAUNCH

- Initial CE-Mark in 1998; currently available in >80 countries worldwide
- 1st Amplatzer PFO Occluder FDA approval Oct. 2016
- TorqVue Delivery System FDA approval Nov. 2007
- Trevisio Delivery System FDA approval Apr. 2019



See Important Safety Information referenced within.

PFO Closure Procedure

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- Performed under **general sedation**
- Guided by fluoroscopy and intracardiac echocardiography, TEE od TCD **(dependent on physician's preference)**
- One sheath in the femoral vein
- Typical procedure takes less than an hour
- One night hospital stay

VIDEO of Amplatzer Procedure

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https://www.youtube.com/watch?v=UIjCrJiWqUY&t=100s

RESPECT Study Design

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- Randomized, event-driven, open label trial with blinded endpoint adjudication
- Patients randomized 1:1 to Amplatzer™ PFO Occluder or medical management alone (aspirin, warfarin, clopidogrel or aspirin with dipyridamole)
- 980 subjects enrolled from 2003 to 2011, followed through 2016
- Sponsored by St. Jude Medical (now Abbott)

PRIMARY ENDPOINT

- Composite of:
  - Recurrent nonfatal ischemic stroke
  - Fatal ischemic stroke
  - Death within 45 days of randomization, or within 30 days of implant

Source: Saver, Carroll JD, Thaler DE, et al. Long-term outcomes of patent foramen ovale closure or medical therapy after stroke. *N Engl J Med*. 2017; 377: 1022-32.

See Important Safety Information referenced within.

RESPECT Trial Results: Efficacy

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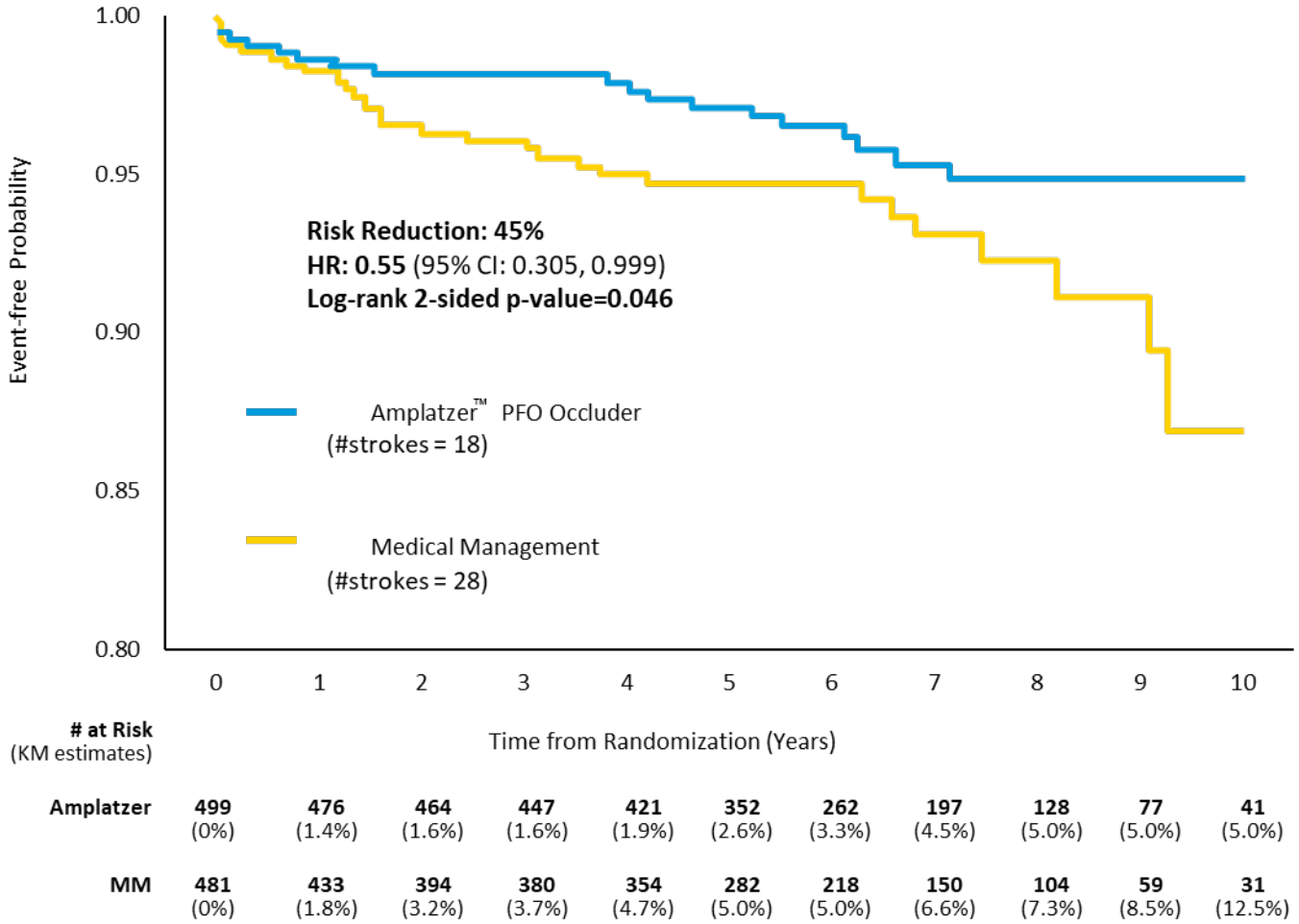
FREEDOM FROM RECURRENT ISCHEMIC STROKE (INTENTION TO TREAT)



# at Risk (KM estimates)											
Amplatzer	**499** (0%)	**476** (1.4%)	**464** (1.6%)	**447** (1.6%)	**421** (1.9%)	**352** (2.6%)	**262** (3.3%)	**197** (4.5%)	**128** (5.0%)	**77** (5.0%)	**41** (5.0%)
MM	**481** (0%)	**433** (1.8%)	**394** (3.2%)	**380** (3.7%)	**354** (4.7%)	**282** (5.0%)	**218** (5.0%)	**150** (6.6%)	**104** (7.3%)	**59** (8.5%)	**31** (12.5%)

45% relative risk reduction in favor of PFO closure for **any** recurrent ischemic stroke or early death.

Source: Saver JL, Carroll JD, Thaler DE, et al. Long-term outcomes of patent foramen ovale closure or medical therapy after stroke. *N Engl J Med*. 2017; 377: 1022-32.

See Important Safety Information referenced within.

RESPECT Summary

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1

RESPECT is the **largest trial of PFO occluders** with longest follow-up, a median of 5.9 years

2

Results showed **significant benefit** of PFO closure vs. medical management alone

- 45% relative risk reduction of recurrent ischemic stroke

3

Long-term follow-up showed **excellent safety profile** for Amplatzer™ PFO Occluder

- ZERO device embolizations, device erosions or device thrombus

Source: Saver JL, Carroll JD, Thaler DE, et al. Long-term outcomes of patent foramen ovale closure or medical therapy after stroke. *N Engl J Med*. 2017; 377: 1022-32.

See Important Safety Information referenced within.

Conclusions

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- There are a multitude of causes for CVA.
- AF and PFOs are two potential etiologies.
- Incredibly important that ALL possible causes are examine prior to any device implantation.
- Multi-disciplinary evaluation is essential.
- If mechanical intervention is warranted, both the Watchman and Amplatzer PFO closure device have excellent data/track record.

THANK YOU!!

Boulder Community Health

WATCHMAN FLX

Boulder Community Health

https://www.youtube.com/watch?v=bErBK5jB5BY&t=61s