

## Introduction

Atrial fibrillation (AFib) is a common cardiac arrhythmia denoted by irregular heartbeats due to incorrect electrical stimulations, leading to symptoms like heart palpitations, shortness of breath, and fatigue at almost random moments in the day. AFib significantly impacts individuals' lives, increasing the risk of stroke, heart failure, and diminished quality of life. In the United States, it affects millions and poses a significant healthcare burden due to its prevalence and associated complications. When Afib occurs, the right atrium of the heart begins to quiver due to the irregular electrical pulses that are travelling around the heart. This causes blood to stay in the chamber and potentially begin clotting. With an aging population paired with the lifestyle and diet of many Americans, its incidence is expected to increase, highlighting the need for effective management and prevention strategies. From the time spent at MHSW, it was noticeable that many of the patients were of low-income, which leads investigations into how Afib lives in the community.

With such a large prevalence of Afib in the American community, what are the effects of this medical phenomenon on a person, and how prevalent is it where procedures are required?

## Methodology

To delve into the topic of Atrial Fibrillation, objective data was collected from electrophysiology surgeons and registered nurses regarding their perspectives on how it occurs, the steps of patient care, and how it affects a patient. The interviewees are employees of the Heart & Vascular Institute at Memorial Hermann Southwest with various years of experience in electrophysiology. The interview questions include the overall scope of patient care, from the steps a doctor takes to making a decision, to the steps made by doctors and nurses during mitigation procedures such as pulmonary vein isolation. The Cath Lab Director was also asked about prevalence in the area of the hospital. Additionally, studies regarding Afib and its effects were interpreted through medical databases to provide numerical data to emphasize the effect and prevalence of Afib in our community.

## The Effect of Atrial Fibrillation on a Person and its Prevalence In Our Community

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## Results

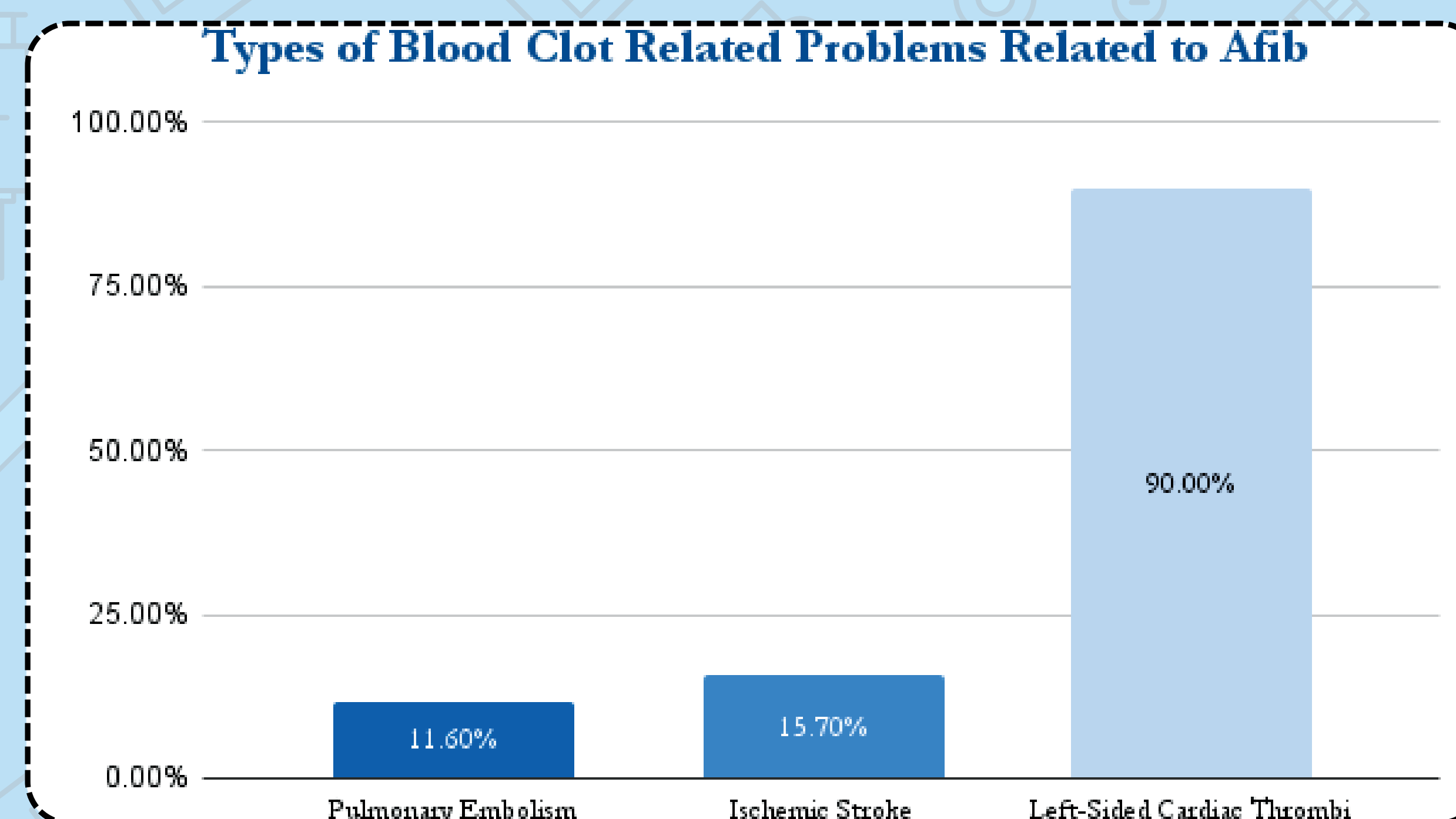


Figure 1: National Library of Medicine journal on "Right Atrial Appendage Thrombus in Atrial Fibrillation"

Proving how Afib is a leading cause of blood clot related health issues.

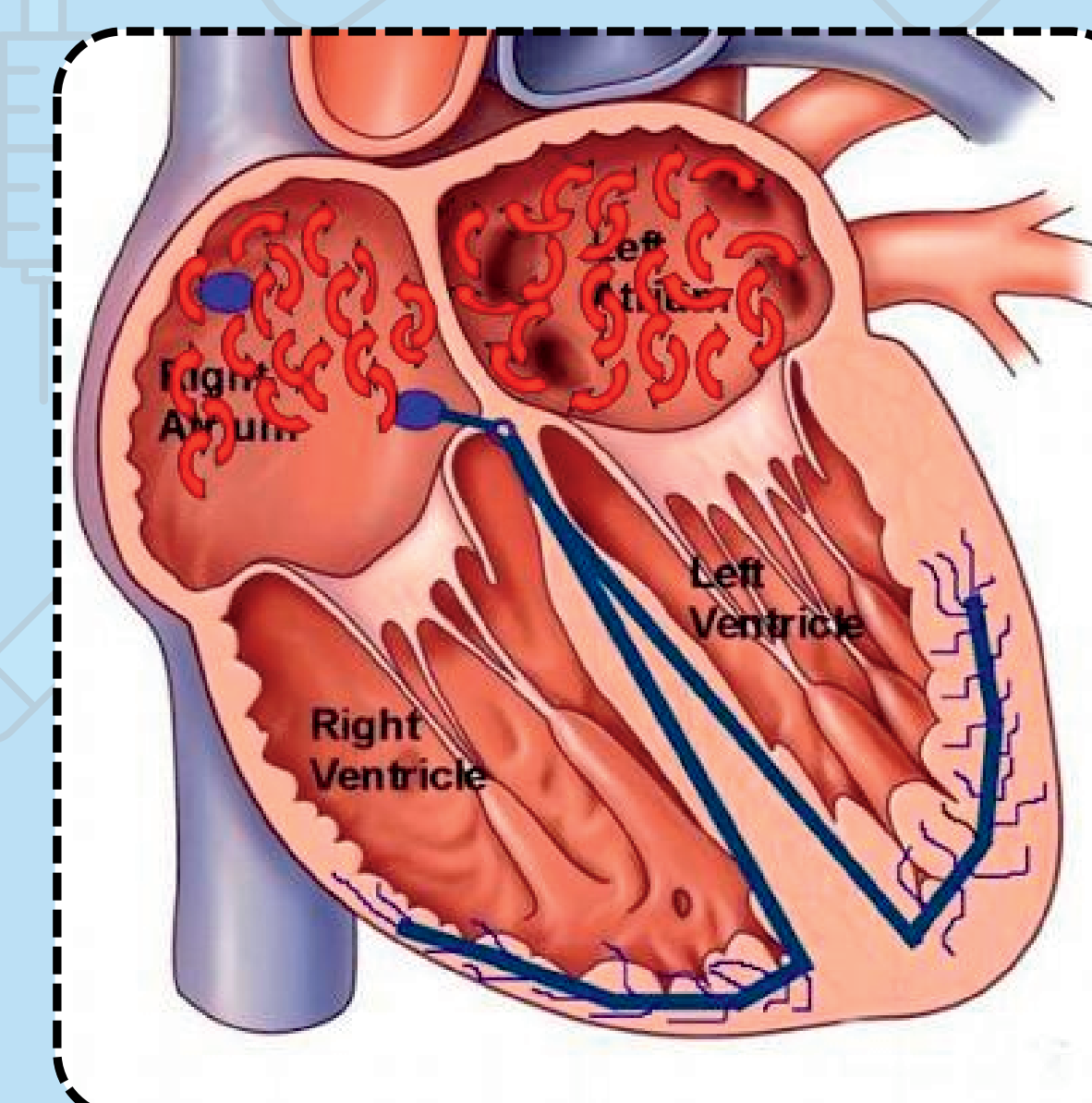


Figure 2: Washington Heart Rhythm Associates drawing of the heart with wavelets of atrial depolarization and chaotic activity typical of atrial fibrillation

### Interview Transcript Quotes from Dr. Amir Azeem M.D

How many patients do you see in a week?: "A conservative guess would be 15-20, maybe more. This includes everyone I see in the office and operating room."

What is the recurrence rate?: "5-10% of the time patients come back after EP surgery where we look for new triggers"

Whats your decision making strategy?: "Multiple factors, we want to know if they have any other major health issues. Let's say they are functional folks living their lives but held back by Afib, then we go for more aggressive choices so they can live on and enjoy their life. But people that are already sick with terminal cancer or illness may not be suitable for aggressive options. Then we stay conservative with medications like blood thinners."

### Interview Transcript Quote from Mario Herrera RN

Do you think Afib is prevalent in this community?: "Surely, many of the patients we get come in when it's already too late, and they go straight to EP surgery. This is because many are of low-income around here and avoid the doctor until something goes wrong. This supports how the current amount of cases would be way more if more people came in to get checked out."

Figure 3: Interview Transcripts

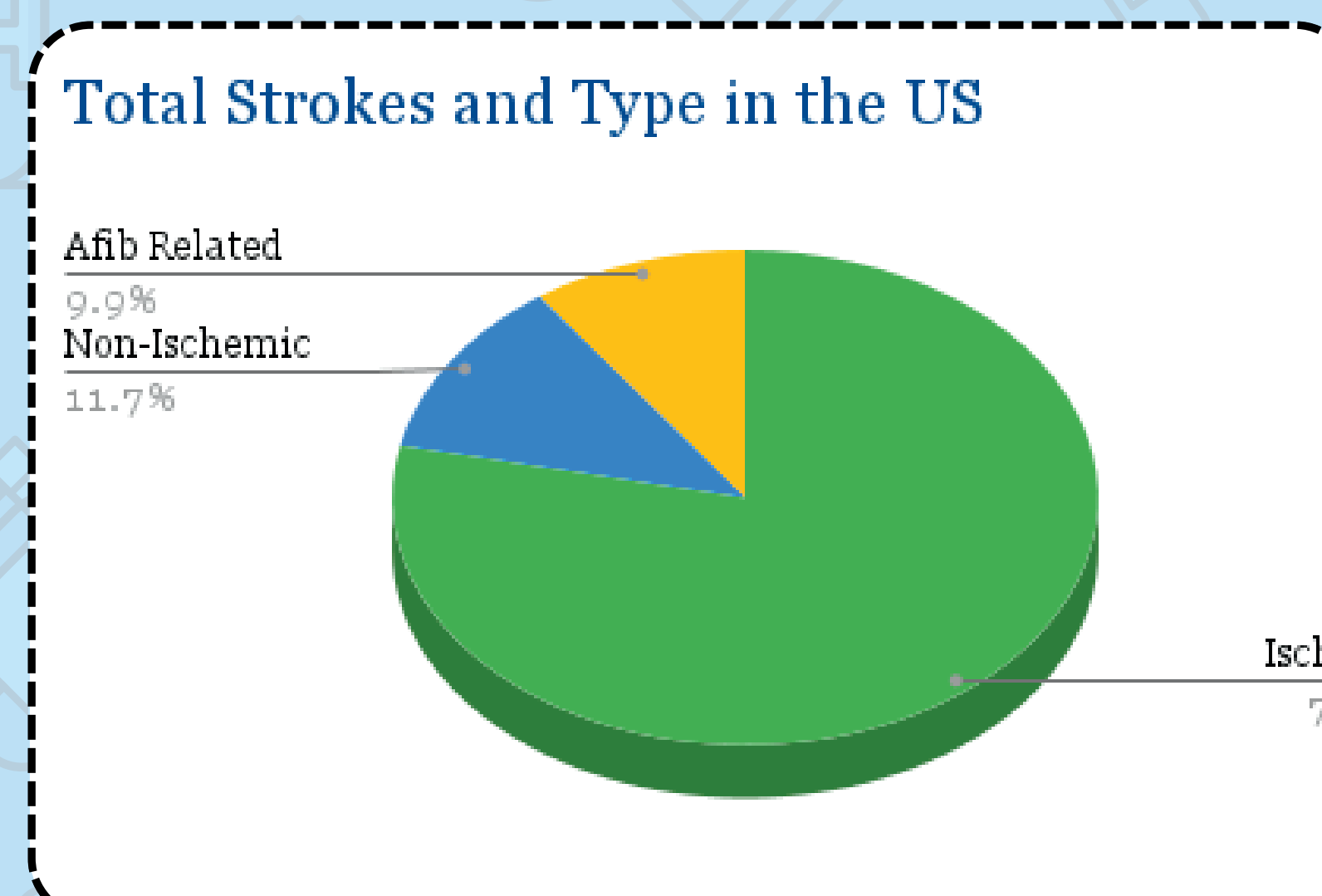


Figure 4: Centers of Disease Control & National Library Of Medicine  
Ischemic strokes account for almost 80% of total strokes in the US, with about 10% of the ischemic strokes caused by Afib

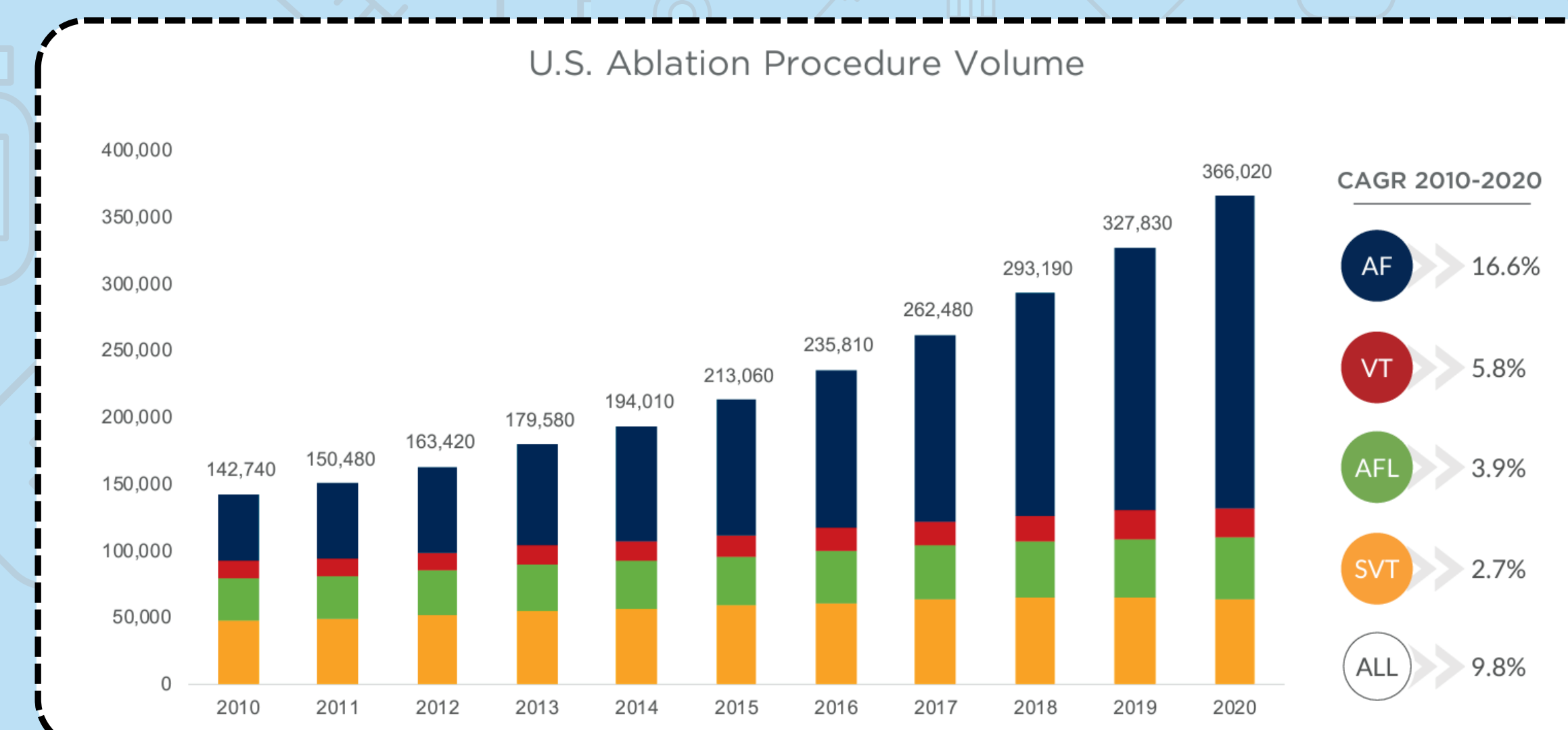


Figure 5: Lars Thording Paper from innovative Health Regarding Number of Ablation Procedures Performed Yearly  
Afib related ablation procedures account for a majority of total procedures

## Findings

After analyzing all the results as a whole, various patterns can be noticed regarding the effects of Afib and what is done to mitigate the problem. Firstly, looking at Figure 2, the process of Afib and how it affects a person is depicted by the top two valves quivering, allowing the microemboli in the blood to form clots in the chambers and move around in the atrium. These different types of clots, as depicted in Figure 1, are almost always related to Afib. About 70,000 ischemic strokes occur per year due to arhythmias. These blood clots can be pumped up through the arteries leading to your brain through the carotid arteries (neck) or other arteries leading to major muscle groups and organs, causing physical and emotional damage to the person. These clots increase the chance of strokes, with over 750,000 people having a stroke per year, as per Figure 4 from the CDC. Of the total strokes per year, ischemic strokes account for about 87%, while Afib accounts for 10-12% of those ischemic strokes. In Figure 5, it is also shown that Afib takes up a large majority of the US ablation procedure volumes. This is a clear correlation to explaining how common of an issue Afib is in the US. In Figure 3, interview with Dr. Azeem, he discusses how he himself treats around 15-20 patients per week regarding Afib, performing Watchmens (filter on the appendage to prevent shooting clots) and ablation surgeries. His medical management (steps to avoid surgery) prove how it is a prevalent problem that is on the rise.

## Discussion

After the time spent at Memorial Hermann Southwest talking to nurses and doctors regarding Afib, I have noticed how they always discuss the low-income area around the hospital. Many patients are of low-income as said in Figure 3, needing surgery due to the fact that they avoided visiting the doctor due to financial problems. In the future, data can be collected within the community itself rather than looking at the country as a whole to pinpoint the prevalence of Afib solely in our community. There is a possible bias from the interview of an electrophysiologist surgeon due to the fact that they specialize in that field, it could be possible to gather data from a hospital database for more an accurate count on patients treated for Afib. In the end, Afib is a phenomenon that one must educate themselves about as they age due to the increased risk of such of a thing occurring, especially with its prolonged effect it has on one's well-being after a stroke.