

# ***PREDICTORS OF RECURRENCE OF ATRIAL FIBRILLATION AFTER ELECTRICAL CARDIOVERSION***

**Thesis**

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**BY**

**Dr: Amr Rizq Rashed**  
**M.B.B.CH**

***Under supervision of***

***Prof. Saeed Abdelhafeez Khaled***

*Professor of cardiology  
Faculty of Medicine, Ain Shams University*

***Dr. Rania Samir Ahmed***

*Lecturer of cardiology  
Faculty of Medicine, Ain Shams University*

***Dr. Gamal Shaaban***

*Consultant of cardiology  
National Heart Institute*

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## *List of Abbreviation*

<i>Abbrev</i>	<i>Meaning</i>
<b>2D</b>	Two dimension
<b>ACC</b>	American College of cardiology
<b>ACEIS</b>	Angiotensin-converting enzyme inhibitors
<b>ACS</b>	Acute coronary syndrome
<b>ACTIVEW</b>	Atrial fibrillation Clopidogrel Trial with Irbesartan for prevention of Vascular Events–Warfarin arm trial
<b>AF</b>	Atrial fibrillation
<b>AFFIRM</b>	Atrial Fibrillation Follow-up Investigation of Rhythm Management
<b>AHA</b>	American Heart Association
<b>AFASAK</b>	Copenhagen Atrial Fibrillation Aspirin Anticoagulation
<b>ARB</b>	Angiotensin Receptor Blocker
<b>ATRIA</b>	Anticoagulation and Risk Factors In Atrial Fibrillation
<b>AV</b>	Atrioventricular
<b>AVN</b>	Atrioventricular Node
<b>AVRO</b>	Active-controlled, multi-center, superiority study of Vernakalant injection versus amiodarone in subjects with Recent Onset atrial fibrillation
<b>BAFTA</b>	The Birmingham Atrial Fibrillation Treatment of the Aged study
<b>BMI</b>	Body mass index
<b>CAD</b>	Coronary artery disease
<b>CCB</b>	Calcium channel blocker

<b><i>CHF</i></b>	Congestive heart failure
<b><i>CI</i></b>	Confident interval
<b><i>COPD</i></b>	Chronic obstructive pulmonary disease
<b><i>CPR</i></b>	Cardiopulmonary resuscitation
<b><i>CT</i></b>	Computered tomography
<b><i>CVS</i></b>	Cerebrovascular stroke
<b><i>DCC</i></b>	Direct current cardioversion
<b><i>DM</i></b>	Diabetes mellitus
<b><i>EAFT</i></b>	European Atrial Fibrillation Trial
<b><i>EAPCI</i></b>	European Association of Percutaneous Cardiovascular Interventions
<b><i>ECG</i></b>	Electrocardiogram
<b><i>ED</i></b>	Emergency department
<b><i>ESC</i></b>	European Society of Cardiology
<b><i>ESPS</i></b>	European stroke prevention study
<b><i>FRACTAL</i></b>	Fibrillation Registry Assessing Costs, Therapies, Adverse events, and Lifestyle
<b><i>GRACE</i></b>	Global Registry of Acute Coronary Events
<b><i>HAS-BLED</i></b>	Hypertension, Abnormal renal/liver function, Stroke, Bleeding history or predisposition, Labile INR, Elderly, Drugs/alcohol concomitantly
<b><i>HOT CAFE'</i></b>	HOw to Treat Chronic Atrial Fibrillation
<b><i>HTN</i></b>	Hypertension
<b><i>IHD</i></b>	Ischemic heart disease
<b><i>INR</i></b>	Optimal international normalized ratio
<b><i>IV</i></b>	Intravenous

<b><i>J-RHYTHM</i></b>	Japanese Rhythm Management Trial for Atrial Fibrillation
<b><i>LA</i></b>	Left Atrium
<b><i>LAA</i></b>	Left Atrial Appendage
<b><i>LASAF</i></b>	Low Dose Aspirin Stroke Atrial Fibrillation
<b><i>LMWH</i></b>	Low molecular weight heparin
<b><i>LVEDP</i></b>	Left ventricular end-diastolic pressure
<b><i>LVEF</i></b>	Left ventricular ejection fraction
<b><i>MHZ</i></b>	Mega hertz
<b><i>MRI</i></b>	Magnetic resonance imaging
<b><i>NSTEMI</i></b>	Non ST segment elevation myocardial infarction
<b><i>NYHA</i></b>	New York Heart Association
<b><i>OAC</i></b>	Oral anticoagulant therapy
<b><i>PAC</i></b>	Premature atrial complex
<b><i>PAD</i></b>	Peripheral arterial disease
<b><i>PATAF</i></b>	Prevention of arterial thromboembolism in atrial fibrillation
<b><i>PCI</i></b>	Percutaneous coronary intervention
<b><i>PIAF</i></b>	Pharmacological Intervention in Atrial Fibrillation
<b><i>PPIS</i></b>	Proton pump inhibitors
<b><i>PUFAS</i></b>	Polyunsaturated fatty acids
<b><i>PVS</i></b>	Pulmonary veins
<b><i>RACE</i></b>	RAte Control versus Electrical cardioversion for persistent atrial fibrillation
<b><i>RBB</i></b>	Right bundle branch

<b><i>RE-LY</i></b>	Randomized Evaluation of Long-term anticoagulant therapy
<b><i>RF</i></b>	Radiofrequency
<b><i>RR</i></b>	Relative Risk
<b><i>SPAF</i></b>	Stroke prevention in atrial fibrillation
<b><i>SPINAF</i></b>	Stroke prevention in Nonrheumatic atrial fibrillation
<b><i>STAF</i></b>	Strategies of Treatment of AF
<b><i>SVT</i></b>	Supraventricular tachycardia
<b><i>TE</i></b>	Thromboembolism
<b><i>TIA</i></b>	Transient ischemic attack
<b><i>TIMI</i></b>	Thrombolysis in myocardial infarction
<b><i>TOE</i></b>	Transesophageal echo
<b><i>UH</i></b>	Unfractionated heparin
<b><i>UFH</i></b>	Unfractionated heparin
<b><i>UK</i></b>	United kingdom
<b><i>UK-TIA</i></b>	United Kingdom-Transient Ischemic Attack Aspirin Trial
<b><i>US</i></b>	United States
<b><i>VKA</i></b>	Vitamin K antagonists
<b><i>VT</i></b>	Ventricular Tachycardia
<b><i>WASPO</i></b>	Warfarin versus Aspirin for Stroke Prevention in Octogenarians with AF trial
<b><i>WPW</i></b>	Wolff-Parkinson-White Syndrome

### *Introduction*

AF is the most common arrhythmia requiring treatment. The overall prevalence in the general population is estimated to be 0.4 percent. This is likely an underestimate because many people with AF are asymptomatic. (*Ostranderld JR, et al, 1965*).

The incidence and prevalence of AF steadily increase with age, such that this arrhythmia occurs in <0.5 percent of the population <50 years of age and increases to approximately 2 percent at ages 60 to 69 years, 4.6 percent for ages 70 to 79 years, and 8.8 percent for ages 80 to 89 years. The age-adjusted prevalence of AF is higher for men than women and higher for whites than blacks. (*Wolf PA, et al, 1991*).

Most cases of AF occur in patients with evidence of structural heart disease, but there may be no evidence of concomitant disease in >50 percent of patients with paroxysmal AF. In contrast, >80 percent of patients with permanent AF have an identifiable underlying cause. (*Klein EA. 2000*).

### *Classification*

AF traditionally has been described as either paroxysmal or chronic. However, the definition of *chronic* varies greatly in the literature, often suggesting permanent AF. The American Heart Association (AHA), American College of Cardiology (ACC), and the European Society of Cardiology(ESC) have proposed a standardized classification scheme to describe AF. (*Fuster V, et al, 2006*).

At the initial detection of AF, it may be difficult to be certain of the subsequent pattern of duration and frequency of recurrences. First detected episode of AF is made on the initial diagnosis.

## Protocol

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When the patient has experienced two or more episodes, AF is classified as recurrent.

After the termination of an episode of AF, the rhythm can be classified as paroxysmal or persistent.

Paroxysmal AF is characterized by self-terminating episodes that generally last <7 days (most <24 hours).

Persistent AF generally lasts >7 days and often requires electrical or pharmacologic cardioversion.

AF is classified as permanent when it has failed cardioversion or when further attempts to terminate the arrhythmia are deemed futile.

It might be more appropriate to use the term established rather than permanent, because these patients can undergo successful ablation to restore and maintain sinus rhythm precluding the concept of *permanent*.

Although this classification scheme is generally useful, the pattern of AF may change in response to treatment. Thus, AF that has been persistent may become paroxysmal during pharmacologic therapy with antiarrhythmic medications.

Persistent atrial fibrillation (AF) may be terminated by transthoracic electrical cardioversion but recurrence of AF is common. Pharmacological therapy can reduce the risk of AF recurrence but carries a risk of adverse reactions and may not be tolerated.

Knowledge of factors that predict recurrence of AF after electrical cardioversion may allow tailoring of therapy for specific groups of AF patients.

## Protocol

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More aggressive therapy may be appropriate for patients at a higher risk of AF recurrence.

Several factors have been identified that predict the risk of AF recurrence after electrical cardioversion including prolonged duration of AF, increased left atrial size, underlying heart disease, and increased heart rate variability. However, the predictive value of these risk factors is limited. (*Brodsky MA, et al, 1989*).

Intermittent AF is precipitated by ectopic activation of the atria from the pulmonary veins in the majority of cases. However, the role of the pulmonary veins in persistent AF is less clear. Atrial tachycardia or focal ectopic beats initiate AF. Furthermore, focal atrial arrhythmias in the 2 min immediately following internal electrical cardioversion are common in persistent AF and have been shown to predict early AFrecurrence. (*Haïssaguerre M, et al, 1998*).

### *Aim of the study*

We hypothesized that patients with frequent premature atrial complexes (PACs) or atrial arrhythmia in the 24 h after external electrical cardioversion would be more likely to have recurrence of AF , so we aim to study the different clinical and ECG predictorsof recurrence of AF following electrical cardioversion.