

# Clinics Review Articles

INTERVENTIONAL CARDIOLOGY CLINICS

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# Approaches to Left Atrial Appendage Exclusion

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**APRIL 2014**

# Approaches to Left Atrial Appendage Exclusion

*Editors*

RANDALL LEE  
MOUSSA C. MANSOUR

## INTERVENTIONAL CARDIOLOGY CLINICS

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April 2014 • Volume 3 • Number 2

## ELSEVIER

1600 John F. Kennedy Boulevard • Suite 1800 • Philadelphia, Pennsylvania, 19103-2899

<http://www.theclinics.com>

### INTERVENTIONAL CARDIOLOGY CLINICS Volume 3, Number 2

April 2014 ISSN 2211-7458, ISBN-13: 978-0-323-29002-9

Editor: Adrienne Brigido

Developmental Editor: Barbara Cohen-Kligerman

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*Interventional Cardiology Clinics* (ISSN 2211-7458) is published quarterly by Elsevier Inc., 360 Park Avenue South, New York, NY 10010-1710. Months of issue are January, April, July, and October. Subscription prices are USD 195 per year for US individuals, USD 305 for US institutions, USD 130 per year for US students, USD 230 per year for Canadian individuals, USD 375 for Canadian institutions, USD 150 per year for Canadian students, USD 295 per year for international individuals, USD 375 for international institutions, and USD 150 per year for international students. To receive student/resident rate, orders must be accompanied by name of affiliated institution, date of term, and the *signature* of program/residency coordinator on institution letterhead. Orders will be billed at individual rate until proof of status is received. Foreign air speed delivery is included in all *Clinics* subscription prices. All prices are subject to change without notice. **POSTMASTER:** Send address changes to *Interventional Cardiology Clinics*, Elsevier Health Sciences Division, Subscription Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. **Customer Service: Telephone: 1-800-654-2452** (U.S. and Canada); **1-314-447-8871** (outside U.S. and Canada). **Fax: 1-314-447-8029.** **E-mail: [journalscustomerservice-usa@elsevier.com](mailto:journalscustomerservice-usa@elsevier.com)** (for print support); **[journalsupport-usa@elsevier.com](mailto:journalsupport-usa@elsevier.com)** (for online support).

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Printed in the United States of America.

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Atrial fibrillation (AF) is the most common cardiac arrhythmia and is associated with a substantial risk of stroke and mortality. Strokes in patients with AF are associated with a greater disability and poorer outcomes than strokes in patients in sinus rhythm. Patients with AF are at increased risk of bleeding, especially if they use anticoagulant therapy. Recent research in the field of anticoagulation has led to development of new anticoagulants for stroke prevention in addition to antiplatelet agents and warfarin. This review discusses the role of AF as a risk factor for stroke and evaluates the role of various schemes for predicting the risk of stroke and bleeding in patients with AF.

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Atrial fibrillation (AF) is the most prevalent arrhythmia encountered in clinical practice with greater than 2.2 million people in the United States being affected. Oral anticoagulant therapy has been used to reduce risk of stroke in patients with nonvalvular AF who are at a high risk of thromboembolism. Alternative treatment strategies to prevent thromboembolism have been tested in patients with AF. This article examines the history of left atrial appendage occlusion and the efficacy of the various surgical techniques and provides a brief overview of the minimally invasive surgical strategy adopted to manage the left atrial appendage.

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Atrial fibrillation is associated with an ongoing risk of thromboembolic stroke and systemic embolism due to stasis and thrombus formation within the left atrial appendage (LAA). Transcatheter occlusion or ligation of the LAA represents a potential paradigm shift in the management of stroke prevention in at-risk patients with atrial fibrillation. This review summarizes the types and rates of procedural complications that have been observed with LAA occlusion and ligation; describes strategies that can be implemented to minimize these complications; and discusses management approaches that may limit the impact of these complications on long-term morbidity.

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## Preface

# Approaches to Left Atrial Appendage Exclusion



Randall Lee, MD, PhD



Moussa C. Mansour, MD, FHRS, FACC

Editors

Atrial fibrillation is currently the most prevalent arrhythmia in the United States, and its prevalence is projected to increase significantly. The most severe consequence of atrial fibrillation is cardioembolic stroke. The mainstay of the prevention of stroke has been warfarin therapy. However, due to the difficulty of maintaining adequate anticoagulation levels, multiple interactions with food and other medications, and the risk of bleeding events, alternative therapies have been established. Despite the development of newer oral anticoagulation agents, problems with side effects, compliance, and bleeding still occur.

The left atrial appendage is a prominent source of cardioembolic stroke in patients with nonvalvular atrial fibrillation. This issue of *Interventional Cardiology Clinics* is dedicated to the role of catheter-based left atrial closure for the treatment of patients with nonvalvular atrial fibrillation who are at risk for cardioembolic events. Articles in this issue provide an overview of the magnitude of the problem of stroke in patients with atrial fibrillation, the role of the left atrial appendage in thrombus formation, and the rationale for exclusion of the left atrial appendage with devices. Different approaches for excluding the left atrial appendage, tips and tricks for successful left atrial

appendage exclusion, and review of the clinical evidence for percutaneous left atrial appendage exclusion are discussed. Special attention is paid to the use of transesophageal echocardiography and how to obtain pericardial access as part of the procedure in performing left atrial appendage closure. Finally, a section is dedicated to prevention and management of complications. The editors would like to thank all the authors who contributed to this comprehensive overview of device therapy for left atrial appendage exclusion.

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# Stroke and Bleeding Risks in Patients with Atrial Fibrillation

Abhishek Maan, MD, Jeremy N. Ruskin, MD,  
E. Kevin Heist, MD, PhD\*

## KEYWORDS

• Atrial fibrillation • Anticoagulant therapy • Stroke

## KEY POINTS

- Atrial fibrillation (AF) is associated with a substantially increased risk of thromboembolic stroke.
- Antiplatelet agents have some effect in reducing the stroke risk associated with AF but are less effective than anticoagulants, such as warfarin, in this regard.
- Newer oral anticoagulants (OACs)—dabigatran, rivaroxaban, and apixaban—are at least as effective as warfarin in reducing AF-associated stroke.
- Anticoagulants used for stroke prevention in AF cause an increased risk of bleeding. Scoring systems are available to better estimate an individual patient's bleeding risk.

## INTRODUCTION

AF is the most common cardiac arrhythmia encountered in clinical practice.<sup>1</sup> The presence of this arrhythmia is an independent risk factor for stroke/thromboembolism and death, with an estimated 5-fold higher risk.<sup>2,3</sup> Anticoagulation with OACs and antiplatelet agents is the mainstay for stroke prophylaxis in patients with AF. A meta-analysis by Hart and colleagues<sup>4</sup> demonstrated that dose-adjusted warfarin resulted in 64% reduction of stroke and a 26% reduction in all-cause mortality compared with placebo, and antiplatelet therapy resulted in 22% reduction in stroke with no significant reduction in mortality. Recent conclusion of major clinical trials has led to the Food and Drug Administration approval of

newer OACs, which has expanded the armamentarium of anticoagulation options for stroke prophylaxis in patients with AF.

Stroke risk is closely related to bleeding risk in AF patients.<sup>5</sup> Many risk factors for thromboembolism, such as advanced age, uncontrolled hypertension, ischemic heart disease, and cerebrovascular disease, have also been identified as risk factors for bleeding.<sup>6,7</sup> Bleeding risk is especially higher with the use of vitamin K antagonists (VKAs) due to their narrow therapeutic window and drug-drug and drug-food interactions.<sup>8</sup> This article reviews the risk of stroke and various risk-prediction schemes to predict stroke risk and bleeding complications in patients with AF and evaluates the role of OACs and antiplatelet agents for stroke prevention.

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Dr E.K. Heist is the senior author in this article.

Disclosures: A. Maan: None; J.N. Ruskin: Astellas/Cardiome—consultant (significant), Biosense Webster—consultant (modest) and fellowship support (significant), Boston Scientific—fellowship support (significant), CardioFocus—clinical oversight committee (no compensation), CardiolnSight—scientific advisory board (modest), CryoCath—scientific steering committee (no compensation), Medtronic—consultant (modest) and fellowship support (significant), Med-IQ—honoraria (modest), Pfizer—consultant and scientific steering committee (modest), Portola—consultant and equity (modest), Sanofi—consultant (modest), St. Jude Medical—fellowship support (significant), and Third Rock Ventures—consultant (significant); E.K. Heist (all modest in amount): Biotronik (research grant, honoraria), Boston Scientific (research grant, consultant, honoraria), Medtronic (honoraria), Sanofi (consultant), Sorin (consultant, honoraria), and St. Jude Medical (research grant, consultant, honoraria).

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Intervent Cardiol Clin 3 (2014) 175–190

<http://dx.doi.org/10.1016/j.iccl.2013.11.001>

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