2019 ACC/AHA Atrial Fibrillation Guideline Update

A presentation for HealthTrust Members, December 18, 2019

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Speaker Disclosure

• The presenter has no real or perceived conflicts of interest related to this presentation.

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Learning Objectives

• Discuss how to calculate a CHA$_2$DS$_2$-VASc score.

• Review new recommendations on when anticoagulation is indicated in patients with atrial fibrillation (AF).

• Apply anticoagulation guideline updates to a patient case scenario.
Atrial Fibrillation (AF)

• Most common sustained arrhythmia diagnosed in clinical practice

• Epidemiology in the United States
  • Estimated 2.7 to 6.1 million diagnosed with atrial fibrillation
  • Lower incidence in African Americans than European descent
  • Increasing prevalence in United States
    • Aging population?

Risk Factors for Atrial Fibrillation

- Increasing age
- European ancestry
- Structural heart disease
- High blood pressure
- Hyperthyroidism
- Obesity
- Chronic kidney disease
- Heavy alcohol use

Pathophysiology of Atrial Fibrillation

• Definition
  • Supraventricular tachyarrhythmia with uncoordinated atrial activation and consequently ineffective atrial contraction

• Mechanism of atrial fibrillation
  • Structural or electrophysiological (EP) abnormalities alter atrial tissue
  • Variety of abnormalities that can lead to atrial fibrillation

• “AF represents a final common phenotype for multiple disease pathways and mechanisms that are incompletely understood”

Diagnosis of Atrial Fibrillation

**Signs**
- Tachycardia
- Irregular pulse
- Hypotension

**Symptoms**
- Fatigue
- Palpitations
- Dizziness
- Syncope
- Dyspnea
- Orthopnea

**Diagnostic Tests**
- Electrocardiogram (ECG or EKG)
- Holter Monitor
- Event Monitor

Electrical activity of a normal heart (left) and a heart with atrial fibrillation (right).

# Classification of Atrial Fibrillation

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paroxysmal Atrial Fibrillation</td>
<td>• Terminates spontaneously or with intervention within 7 days of onset</td>
</tr>
<tr>
<td></td>
<td>• May recur with variable frequency</td>
</tr>
<tr>
<td>Persistent Atrial Fibrillation</td>
<td>• Continuous atrial fibrillation sustained &gt; 7 days</td>
</tr>
<tr>
<td>Long-standing Atrial Fibrillation</td>
<td>• Continuous atrial fibrillation &gt; 12 months in duration</td>
</tr>
<tr>
<td>Permanent Atrial Fibrillation</td>
<td>• Term used when patient and clinician make joint decision to stop further attempts to restore and/or maintain sinus rhythm</td>
</tr>
<tr>
<td></td>
<td>• Represents a therapeutic attitude vs. pathophysiological description</td>
</tr>
<tr>
<td>Nonvalvular Atrial Fibrillation</td>
<td>• Absence of moderate-to-severe mitral stenosis or mechanical heart valve**</td>
</tr>
</tbody>
</table>

Complications of Atrial Fibrillation

- Ischemic Stroke
- Peripheral Thromboembolism
- Heart Failure
- Dementia
- Mortality

Pharmacologic Management of Atrial Fibrillation

- Prevention of thromboembolism
  - Decision between patient and provider
  - Risk stratification scoring systems provide assistance

- Risk stratification for bleeding and thromboembolism risk
  - Thromboembolism - CHA$_2$DS$_2$-VASc, CHADS$_2$
  - Bleeding - HAS-BLED, ATRIA

- Rhythm versus rate control
  - Will not plan to discuss during this webinar
  - Refer to 2014 ACC-AHA-HRS AF guidelines
<table>
<thead>
<tr>
<th>CHADS₂ Score Components (possible points)</th>
<th>Point Totals</th>
<th>Adjusted Stroke Rate (% per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive Heart Failure (1 point)</td>
<td>0</td>
<td>1.9%</td>
</tr>
<tr>
<td>Hypertension (1 point)</td>
<td>1</td>
<td>2.8%</td>
</tr>
<tr>
<td>Age ≥ 75 years (1 point)</td>
<td>2</td>
<td>4.0%</td>
</tr>
<tr>
<td>Diabetes mellitus (1 point)</td>
<td>3</td>
<td>5.9%</td>
</tr>
<tr>
<td>Stroke, Transient Ischemic Attack (TIA), or Thromboembolism (TE) (2 points)</td>
<td>4</td>
<td>8.5%</td>
</tr>
<tr>
<td>Maximum Score</td>
<td>5</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CHADS₂ Score Components (possible points)</th>
<th>Point Totals</th>
<th>Adjusted Stroke Rate (% per year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive Heart Failure (1 point)</td>
<td>1</td>
<td>1.3%</td>
</tr>
<tr>
<td>Hypertension (1 point)</td>
<td>2</td>
<td>2.2%</td>
</tr>
<tr>
<td>Age ≥ 75 years (2 point)</td>
<td>3</td>
<td>3.2%</td>
</tr>
<tr>
<td>Diabetes mellitus (1 point)</td>
<td>4</td>
<td>4.0%</td>
</tr>
<tr>
<td>Stroke, TIA, or TE (2 points)</td>
<td>5</td>
<td>6.7%</td>
</tr>
<tr>
<td>Vascular disease (1 point)</td>
<td>6</td>
<td>9.8%</td>
</tr>
<tr>
<td>Age 65 to 74 years (1 point)</td>
<td>7</td>
<td>9.6%</td>
</tr>
<tr>
<td>Sex category (female, 1 point)</td>
<td>8</td>
<td>6.7%</td>
</tr>
<tr>
<td>Maximum Score</td>
<td>9</td>
<td>15.20%</td>
</tr>
</tbody>
</table>

CHA$_2$DS$_2$-VASc Score

- Developed in 2010 as update to CHADS$_2$ score
  - Improved at identifying “low risk” patients

- Clinical question- Is CHA$_2$DS$_2$-VASc the best stroke risk prediction tool?
  - Results from validation studies in different ethnicities vary
  - Debate about what score (0 vs. 1) is considered low risk
  - Is sex category a risk factor or risk modifier?

- 2014 ACC/AHA/HRS Guidelines
  - “Continued evolution of atrial fibrillation related thromboembolic risk evaluation is needed”

# HAS-BLED Score

<table>
<thead>
<tr>
<th>HAS-BLED Components (possible points)</th>
<th>Point Totals</th>
<th>Risk of Major Bleeding</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0.9%</td>
</tr>
<tr>
<td>Hypertension (Systolic blood pressure &gt; 160 mm Hg, 1 point)</td>
<td>1</td>
<td>3.4%</td>
</tr>
<tr>
<td>Abnormal renal/liver function (1 point)</td>
<td>2</td>
<td>4.1%</td>
</tr>
<tr>
<td>Stroke history (1 point)</td>
<td>3</td>
<td>5.8%</td>
</tr>
<tr>
<td>Bleeding history or predisposition (1 point)</td>
<td>4</td>
<td>8.9%</td>
</tr>
<tr>
<td>Labile INR (2 points)</td>
<td>5</td>
<td>9.1%</td>
</tr>
<tr>
<td>Elderly (age &gt; 65 years, 1 point)</td>
<td>6</td>
<td>18.2%</td>
</tr>
<tr>
<td>Drugs predisposing bleeding (aspirin, clopidogrel, etc., 1 point)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol usage (1 point)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CHADS2-VASc Score for Atrial Fibrillation Stroke Risk**

Calculates stroke risk for patients with atrial fibrillation, possibly better than the CHADS2 Score.

<table>
<thead>
<tr>
<th>When to Use</th>
<th>Pearls/Pitfalls</th>
<th>Why Use</th>
</tr>
</thead>
</table>

### Age

- **<65**
- **65-74**
- **≥75**

### Sex

- **Female** +1
- **Male** 0

### CHF history

- **No** 0
- **Yes** +1

### Hypertension history

- **No** 0
- **Yes** +1

### Stroke/TIA/thromboembolism history

- **No** 0
- **Yes** +2

### Vascular disease history (prior MI, peripheral artery disease, or aortic plaque)

- **No** 0
- **Yes** +1

### Diabetes history

- **No** 0
- **Yes** +1

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**CRITICAL ACTIONS**

- One recommendation suggests a 0 score is “low” risk and may not require anticoagulation; a 1 score is “low-moderate” risk and should consider antiplatelet or anticoagulation, and score 2 or greater is “moderate-high” risk and should otherwise be an anticoagulation candidate.

- Consider not starting anticoagulation in patients with non-valvular AF and a CHADS2-VASc score of 0 as these patients had no TE events in the original study.

- For those patients in whom anticoagulation is considered, risk bleeding scores such as **AFTRIA** can be used to determine the risk for warfarin-associated hemorrhage.

- Carefully consider all the risks and benefits prior to initiating anticoagulation in patients with non-valvular AF.

- Some guidelines suggest that aspirin monotherapy is not supported by evidence.

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# HAS-BLED Score for Major Bleeding Risk

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

<table>
<thead>
<tr>
<th>When to Use</th>
<th>Pearls/Pitfalls</th>
<th>Why Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Uncontrolled, &gt;150 mmHg systolic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renal disease</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Dialysis, transplant, Cr &gt;2.26 mg/dL or &gt;200 μmol/L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liver disease</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Cirrhosis or bilirubin &gt;2x normal with AST/ALT/AP &gt;3x normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke history</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Prior major bleeding or predisposition to bleeding</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Labile INR</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Unstable/high INRs, time in therapeutic range &lt;60%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age &gt;65</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Medication usage predisposing to bleeding</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
<tr>
<td>Aspirin, clopidogrel, NSAIDs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol use ≥8 drinks/week</td>
<td><strong>No 0</strong></td>
<td>Yes +1</td>
</tr>
</tbody>
</table>

**4 points**

Risk was 8.9% in one validation study (Lip 2011) and 8.70 bleeds per 100 patient-years in another validation study (Pisters 2010).

Alternatives to anticoagulation should be considered: Patient is at high risk for major bleeding.

Source: Images obtained at https://www.mdcalc.com/has-bled-score-major-bleeding-risk#evidence
Patient Case—Question 1

- 69-year-old Caucasian female is found to be in atrial fibrillation during an inpatient stay at your hospital. After reviewing her chart, you identify that her past medical history includes hypertension, diabetes, obesity and hyperlipidemia. What is her CHA$_2$DS$_2$-VASc score?

  - A. 2
  - B. 3
  - C. 4
  - D. 5
Patient Case—Response 1

• 69-year-old Caucasian female is found to be in atrial fibrillation during an inpatient stay at your hospital. After reviewing her chart, you identify that her past medical history includes hypertension, diabetes, obesity and hyperlipidemia. What is her CHA₂DS₂-VASc score?

  • A. 2
  • B. 3
  • c. 4
  • D. 5
Purpose of the update
• New evidence, medications and devices since 2014

Guideline updates focused on anticoagulation
• CHA₂DS₂-VASc score risk stratification changes
• Anticoagulant choices in end-stage renal disease or hemodialysis

Refer to 2014 Atrial Fibrillation Guidelines for unchanged recommendations

2019 AF Guidelines: Anticoagulant Therapy Recommendations

CHA$_2$DS$_2$-VASc score recommended to assess stroke risk

• Anticoagulant therapy based on thromboembolism risk

Mechanical heart valves: warfarin recommended anticoagulant

Anticoagulant therapy based on thromboembolism risk

• Regardless of classification as paroxysmal, persistent, or permanent atrial fibrillation

# 2014 AF Guidelines: Antithrombotic Therapy Recommendations

## Nonvalvular Atrial Fibrillation

<table>
<thead>
<tr>
<th>CHA$_2$DS$_2$-VASc Score</th>
<th>Other Criteria</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>–</td>
<td>Reasonable to omit antithrombotic therapy</td>
</tr>
<tr>
<td>1</td>
<td>–</td>
<td>No antithrombotic therapy or Oral anticoagulant or Aspirin may be considered</td>
</tr>
<tr>
<td>Greater than or equal to 2</td>
<td>–</td>
<td>Oral anticoagulants recommended</td>
</tr>
<tr>
<td>Greater than or equal to 2</td>
<td>End stage kidney disease (CrCl &lt; 15 mL/min) or on hemodialysis</td>
<td>Reasonable to prescribe warfarin for oral anticoagulation</td>
</tr>
<tr>
<td>-</td>
<td>Previous stroke or transient ischemic attack (TIA)</td>
<td>Oral anticoagulants recommended</td>
</tr>
</tbody>
</table>

## 2019 AF Guidelines: Antithrombotic Therapy Recommendations

### Nonvalvular Atrial Fibrillation in Men

<table>
<thead>
<tr>
<th>$\text{CHA_2DS_2-VASc Score}$</th>
<th>Other Criteria</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>–</td>
<td>Reasonable to omit antithrombotic therapy</td>
</tr>
<tr>
<td>1</td>
<td>–</td>
<td>May consider oral anticoagulation</td>
</tr>
<tr>
<td>Greater than or equal to 2</td>
<td>–</td>
<td>Oral anticoagulants recommended (warfarin, dabigatran, apixaban, rivaroxaban, edoxaban)</td>
</tr>
<tr>
<td>Greater than or equal to 2</td>
<td>End stage kidney disease (CrCl &lt; 15 mL/min) or on hemodialysis</td>
<td>Reasonable to prescribe warfarin or apixaban for oral anticoagulation</td>
</tr>
</tbody>
</table>

### 2019 AF Guidelines: Antithrombotic Therapy Recommendations

#### Nonvalvular Atrial Fibrillation in Women

<table>
<thead>
<tr>
<th>CHA$_2$DS$_2$-VASc Score</th>
<th>Other Criteria</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>–</td>
<td>Reasonable to omit antithrombotic therapy</td>
</tr>
<tr>
<td>2</td>
<td>–</td>
<td>May consider oral anticoagulation</td>
</tr>
<tr>
<td>Greater than or equal to 3</td>
<td>–</td>
<td>Oral anticoagulants recommended (warfarin, dabigatran, apixaban, rivaroxaban, edoxaban)</td>
</tr>
<tr>
<td>Greater than or equal to 3</td>
<td>End stage kidney disease (CrCl &lt; 15 mL/min) or on hemodialysis</td>
<td>Reasonable to prescribe warfarin or apixaban for oral anticoagulation</td>
</tr>
</tbody>
</table>

CHA\textsubscript{2}DS\textsubscript{2}-VASc Scoring and Anticoagulation in Women

- Evidence supports female sex as risk factor for stroke in atrial fibrillation
  - 1.31-fold elevated risk of stroke in females with atrial fibrillation
  - Greatest risk in females aged ≥ 75 years

- What about female sex in absence of other risk factors?

- Sex category as a risk modifier vs. risk factor for stroke
  - Discussion surrounding how to risk stratify women
  - “Adding female sex to the CHA2DS2-VASc score matters for age > 65 years or ≥ 2 non-sex related stroke risk factors”

• Methods
  • Identified patients with incident nonvalvular AF from January 1, 1997 to December 31, 2015
  • Calculated CHA2DS2-VASc scores and followed for 1 year through Danish National Patient Registry
  • Primary outcome: hospital code for ischemic stroke or systemic embolism

• Results
  • 239,671 patients, 48.7% female
  • Mean age: 76.6 years (women), 70.3 years (men)
  • Mean CHA2DS2-VASc scores: 2.7 (women) and 2.3 (men)
  • Overall 1-year thromboembolic rate per 100 person-years: 7.3 (women) and 5.7 (men)
  • 1-year absolute risk of thromboembolism: 0.5% for men with CHA2DS2-VASc score of 0

• Conclusions
  • Female patients with atrial fibrillation have similar thromboembolic risk in comparison with male patients

Female Sex Is a Risk Modifier Rather Than a Risk Factor for Stroke in Atrial Fibrillation

Patient Case (continued)—Question 2

- 69-year-old Caucasian female is found to be in atrial fibrillation during an inpatient stay at your hospital. After reviewing her chart, you identify that her past medical history includes obesity and hyperlipidemia. You calculated her CHA\textsubscript{2}DS\textsubscript{2}-VASc score to be 2.

- The medical resident asks for your recommendation regarding thromboembolism prevention. What do you tell the physician?

- A. Recommend no oral anticoagulant
- B. Recommend aspirin 81mg po daily
- C. Recommend clopidogrel 75mg po daily
- D. Recommend rivaroxaban 20mg po daily
Patient Case (continued)—Response 2

- 69-year-old Caucasian female is found to be in atrial fibrillation during an inpatient stay at your hospital. After reviewing her chart, you identify that her past medical history includes obesity and hyperlipidemia. You calculated her CHA$_2$DS$_2$-VASc score to be 2.

- The medical resident asks for your recommendation regarding thromboembolism prevention. What do you tell the physician?

- A. Recommend no oral anticoagulant
- B. Recommend aspirin 81mg po daily
- C. Recommend clopidogrel 75mg po daily
- D. Recommend rivaroxaban 20mg po daily
Non-vitamin K oral anticoagulants (NOACs) recommended over warfarin in NOAC-eligible patients with atrial fibrillation

- Examples: dabigatran, rivaroxaban, apixaban, edoxaban
- Exclusion criteria: moderate-to-severe mitral stenosis or mechanical heart valve

Consistent evidence of non-inferiority of NOACs vs. warfarin

Recommendation consistent with 2018 CHEST and European Society of Cardiology Atrial Fibrillation Guidelines

Edoxaban (Savaysa®)

- Approved for use in atrial fibrillation in January 2015
  - ENGAGE-TIMI trial
  - Edoxaban 60mg po daily noninferior to warfarin
  - Lower rates of major bleeding versus warfarin

- Mechanism of action
  - Factor Xa inhibitor

- Dosing
  - Not to be used in 15 mL/min < CrCl > 95 mL/min
  - CrCl 51-95 mL/min: 60mg PO daily
  - CrCl 15-50 mL/min: 30 mg PO daily

- Adverse effects
  - Similar to other oral anticoagulants

<table>
<thead>
<tr>
<th>Name of Medication</th>
<th>Clinical Trial Comparing to Warfarin</th>
<th>Study Information</th>
<th>Efficacy Results</th>
<th>Safety Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dabigatran (Pradaxa®)</td>
<td>RE-LY trial</td>
<td>Subject number= 18,113 Mean TTR= 64% Mean CHADS$_2$= 2.1 Primary outcome= stroke and systemic embolism</td>
<td>• Dabigatran 150mg PO BID superior to warfarin</td>
<td>• Significantly lower risk of hemorrhagic stroke for dabigatran group • GI bleeding higher in dabigatran 150mg BID group</td>
</tr>
<tr>
<td>Rivaroxaban (Xarelto®)</td>
<td>ROCKET-AF trial</td>
<td>Subject number= 14,264 Mean TTR= 55% Mean CHADS$_2$= 3.47 Primary outcome= stroke and systemic embolism</td>
<td>• Rivaroxaban 20mg po daily non-inferior to warfarin • Superiority not achieved</td>
<td>• Less fatal bleeding and intracranial hemorrhage for rivaroxaban group</td>
</tr>
<tr>
<td>Apixaban (Eliquis®)</td>
<td>ARISTOTLE-AF trial</td>
<td>Subject number= 18,201 Mean TTR= 62% Mean CHADS$_2$= 2.1 Primary outcome= stroke and systemic embolism</td>
<td>• Apixaban significantly better with fewer strokes versus warfarin</td>
<td>• Significantly fewer intracranial bleeds in apixaban group • Similar GI bleeding between treatment groups</td>
</tr>
<tr>
<td>Edoxaban (Savaysa®)</td>
<td>ENGAGE-TIMI trial</td>
<td>Subject number= 21,105 Mean TTR= 68.4% CHADS$_2$ = 78% (≤3), 22% (4-6) Primary outcome= stroke and systemic embolism</td>
<td>• Edoxaban non-inferior to warfarin</td>
<td>• Lower rate of major bleeding in edoxaban group</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name of Medication</th>
<th>Mechanism of Action</th>
<th>Dosing for Nonvalvular AF</th>
<th>Renal Dose Adjustment</th>
</tr>
</thead>
</table>
| Dabigatran (Pradaxa®) | Direct thrombin inhibitor | 150mg PO BID | • CrCl 30-50 mL/min and receiving dronedarone or ketoconazole: 75mg PO BID  
• CrCl 15-30 mL/min: 75mg PO BID  
  o If on PGP inhibitor: avoid concurrent use  
• CrCl < 15 mL/min: no dosage adjustment in manufacturer’s labeling  
• Hemodialysis: no dosage adjustment in package insert |
| Rivaroxaban (Xarelto®) | Factor Xa inhibitor | 20mg PO daily with food | • CrCl 15-50 mL/min: 15mg PO daily with food  
• CrCl < 15 mL/min: experts recommend avoiding use |
| Apixaban (Eliquis®) | Factor Xa inhibitor | 5mg PO BID | • Serum creatinine (SCr) < 1.5 mg/dL: no dosage adjustment unless ≥ 80 years old AND body weight ≤ 60 kg: 2.5mg PO BID  
• SCr ≥ 1.5 mg/dL and ≥ 80 years old or body weight ≤ 60 kg: 2.5mg PO BID  
• Other clinical situations- see upcoming slides |
| Edoxaban (Savaysa®) | Factor Xa inhibitor | 60mg PO daily | See previous slide on Edoxaban |

For AF and moderate-to-severe chronic kidney disease (CKD) with elevated CHA₂DS₂-VASc score, consider treatment with reduced doses of direct thrombin or factor Xa inhibitors

- Examples: apixaban, dabigatran, rivaroxaban, edoxaban

For AF and CHA₂DS₂-VASc score ≥ 2 (men) or ≥ 3 (women) with end-stage chronic kidney disease (CrCl < 15 mL/min) or on hemodialysis, reasonable to prescribe warfarin or apixaban for oral anticoagulants

For patients with AF and end-stage chronic kidney disease or on hemodialysis, dabigatran, edoxaban, and rivaroxaban are NOT recommended

Apixaban in Severe Chronic Kidney Disease or Hemodialysis

- Not dialyzable to minimally dialyzable

- Single-dose pharmacokinetic and pharmacodynamic study in 8 patients with end-stage kidney disease on hemodialysis
  - Manufacturer recommendation: no dosage adjustment recommended unless either ≥80 years of age or body weight ≤60 kg, then reduce to 2.5 mg twice daily.

- Cohort study of patients with end-stage kidney disease requiring hemodialysis
  - Apixaban 5mg PO BID resulted in fewer thromboembolic and bleeding events vs. warfarin
  - Apixaban 2.5mg PO BID resulted in fewer bleeding events vs. warfarin

- Only one retrospective study completed to assess clinical efficacy and safety
  - Summary: use with caution

Question 3—Which of the following oral anticoagulants may be used in a patient with AF and end-stage chronic kidney disease on hemodialysis? Select all that apply.

- A. Rivaroxaban
- B. Edoxaban
- C. Dabigatran
- D. Apixaban
- E. Warfarin
Response 3—Which of the following oral anticoagulants may be used in a patient with AF and end-stage chronic kidney disease on hemodialysis? Select all that apply.

- A. Rivaroxaban
- B. Edoxaban
- C. Dabigatran
- D. Apixaban
- E. Warfarin
For patients with AF for > 48 hours or unknown duration, warfarin or a NOAC is recommended 3 weeks before and 4 weeks after cardioversion.

- Regardless of CHA₂DS₂-VASc score or cardioversion method

If immediate cardioversion required due to hemodynamic instability, anticoagulation initiated as soon as possible and continued ≥ 4 weeks after cardioversion unless contraindicated.

After cardioversion, long-term anticoagulation decision based on thromboembolic versus bleeding risk.

Conclusion

• **CHA$_2$DS$_2$-VASc risk stratification**
  • Still reigns as risk predictor tool
  • Updates on “high risk” scores for males and females

• **Anticoagulants approved for atrial fibrillation**
  • Edoxaban approved in 2015

• **End-stage kidney disease or hemodialysis**
  • Can consider apixaban at your own liability
  • No other NOACs mentioned for use in end stage chronic kidney disease or patients on hemodialysis
References


Thank you!

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