A Discussion of the 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation

Wednesday | February 21, 2024 | 12:00pm ET

Anticoagulation FORUM

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Circulation

CLINICAL PRACTICE GUIDELINES

2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation: A Report of the American College of Cardiology/ American Heart Association Joint Committee on Clinical Practice Guidelines

Developed in Collaboration With and Endorsed by the American College of Clinical Pharmacy and the Heart Rhythm Society

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Circulation. 2023 Aug 29;148(9):e9-e119.

Strength of Recommendation & Level of Evidence

Table 2. Applying American College of Cardiology/American Heart Association Class of Recommendation and Level of Evidence to Clinical Strategies, Interventions, Treatments, or Diagnostic Testing in Patient Care* (Updated May 2019)

CLASS (STRENGTH) OF RECOMMENDATION	LEVEL (QUALITY) OF EVIDENCE‡
CLASS 1 (STRONG) — **Benefit >>> Risk** **Suggested phrases for writing recommendations:** • Is recommended • Is indicated/useful/effective/beneficial • Should be performed/administered/other • Comparative-Effectiveness Phrases†: – Treatment/strategy A is recommended/indicated in preference to treatment B – Treatment A should be chosen over treatment B	**LEVEL A** • High-quality evidence‡ from more than 1 RCT • Meta-analyses of high-quality RCTs • One or more RCTs corroborated by high-quality registry studies
CLASS 2a (MODERATE) — **Benefit >> Risk** **Suggested phrases for writing recommendations:** • Is reasonable • Can be useful/effective/beneficial • Comparative-Effectiveness Phrases†: – Treatment/strategy A is probably recommended/indicated in preference to treatment B – It is reasonable to choose treatment A over treatment B	**LEVEL B-R (Randomized)** • Moderate-quality evidence‡ from 1 or more RCTs • Meta-analyses of moderate-quality RCTs
	LEVEL B-NR (Nonrandomized) • Moderate-quality evidence‡ from 1 or more well-designed, well-executed nonrandomized studies, observational studies, or registry studies • Meta-analyses of such studies
CLASS 2b (WEAK) — **Benefit ≥ Risk** **Suggested phrases for writing recommendations:** • May/might be reasonable • May/might be considered • Usefulness/effectiveness is unknown/unclear/uncertain or not well-established	**LEVEL C-LD (Limited Data)** • Randomized or nonrandomized observational or registry studies with limitations of design or execution • Meta-analyses of such studies • Physiological or mechanistic studies in human subjects
CLASS 3: No Benefit (MODERATE) (Generally, LOE A or B use only) — **Benefit = Risk** **Suggested phrases for writing recommendations:** • Is not recommended • Is not indicated/useful/effective/beneficial • Should not be performed/administered/other	**LEVEL C-EO (Expert Opinion)** • Consensus of expert opinion based on clinical experience
Class 3: Harm (STRONG) — **Risk > Benefit** **Suggested phrases for writing recommendations:** • Potentially harmful • Causes harm • Associated with excess morbidity/mortality • Should not be performed/administered/other	

COR and LOE are determined independently (any COR may be paired with any LOE).

A recommendation with LOE C does not imply that the recommendation is weak. Many important clinical questions addressed in guidelines do not lend themselves to clinical trials. Although RCTs are unavailable, there may be a very clear clinical consensus that a particular test or therapy is useful or effective.

* The outcome or result of the intervention should be specified (an improved clinical outcome or increased diagnostic accuracy or incremental prognostic information).

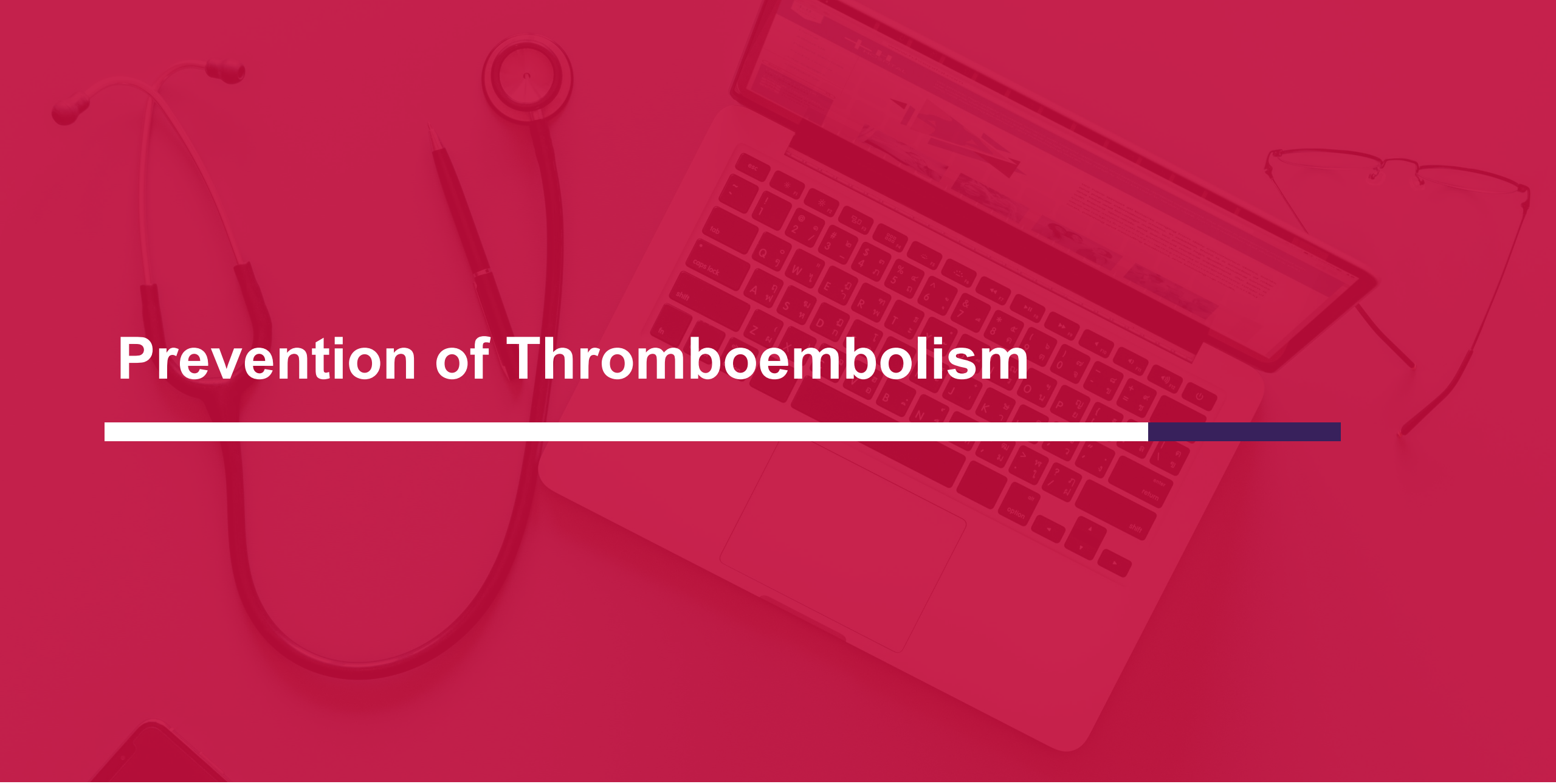
† For comparative-effectiveness recommendations (COR 1 and 2a; LOE A and B only), studies that support the use of comparator verbs should involve direct comparisons of the treatments or strategies being evaluated.

‡ The method of assessing quality is evolving, including the application of standardized, widely-used, and preferably validated evidence grading tools; and for systematic reviews, the incorporation of an Evidence Review Committee.

COR indicates Class of Recommendation; EO, expert opinion; LD, limited data; LOE, Level of Evidence; NR, nonrandomized; R, randomized; and RCT, randomized controlled trial.

Circulation. 2023 Aug 29;148(9):e9-e119.

Prevention of Thromboembolism



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Sharded Decision-Making (SDM)

Recommendation for SDM in AF Management
Referenced studies that support the recommendation are summarized in the Online Data Supplement.

COR	LOE	Recommendation
2b	B-R	1. In patients with AF, the use of evidence-based decision aids might be useful to guide stroke reduction therapy treatment decisions throughout the disease course to improve engagement, decisional quality, and patient satisfaction.[1–4]

Publicly Available Decision Aids

Agency	Website	Focus Area
American College of Cardiology Colorado Program for Patient Centered Decisions	https://patientdecisionaid.org/icd/atrial-fibrillation/	Stroke risk reduction therapies
Anticoagulation Choice Decision Aid (Mayo Clinic)	https://anticoagulationdecisionaid.mayoclinic.org/	Stroke risk reduction therapies
Ottawa Hospital Research Institute Developer Healthwise	https://decisionaid.ohri.ca/AZlist.html	AF ablation Stroke risk reduction
Stanford	https://afibguide.com/	Stroke risk reduction therapies

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Circulation. 2023 Aug 29;148(9):e9-e119.

Risk Stratification Schemes

COR	LOE	Recommendations
1	B-NR	Patients with AF should be **evaluated for their annual risk of thromboembolic events using a validated clinical risk score, such as CHA_2DS_2-VASc.**
1	B-NR	Patients with AF should be **evaluated for factors that specifically indicate a higher risk of bleeding**, such as previous bleeding and use of drugs that increase bleeding risk, **in order to identify possible interventions to prevent bleeding on anticoagulation**.
2a	C-LD	Patients with AF **at intermediate annual risk of thromboembolic events by risk scores** (eg, equivalent to CHA_2DS_2-VASc score of 1 in men or 2 in women), **who remain uncertain about the benefit of anticoagulation, can benefit from consideration of factors that might modify their risk of stroke to help inform the decision.***
3: No Benefit	B-NR	In patients who are deemed at high risk for stroke, **bleeding risk scores should not be used in isolation to determine eligibility for oral anticoagulation** but instead to identify and modify bleeding risk factors and to inform medical decision-making

Factors may include AF burden or other features in Table 3.

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Stroke Risk Models & Additional Risk Factors

Year of Publication, Score Name	Score Components	Potential Advantages	No. of Validation Studies[19]	Hyperlink to Online Score Calculator, if Available
2001 $CHADS_2$[25]	CHF, hypertension, age (≥65 y is 1 point, ≥75 y is 2 points), diabetes, stroke/TIA (2 points)	$CHADS_2$ was superior to existing risk classification schemes AFI scheme: C-statistic, 0.68 (0.65–0.71) SPAF-III scheme: C-statistic, 0.74 (0.71–0.76) $CHADS_2$ score: C-statistic, 0.82 (0.80–0.84)	46	https://www.mdcalc.com/calc/40/chads2-score-atrial-fibrillation-stroke-risk
2010 CHA_2DS_2-$VASc_2$	CHF, hypertension, age ≥75 y, diabetes, stroke or TIA, vascular disease, age 65–74 y, female sex	Most commonly used and studied, superior to $CHADS_2$ score. C-statistic, 0.606 (0.513–0.699) for CHA_2DS_2-VASc score vs 0.561 (0.450–0.672) for $CHADS_2$ score Improved compared with original $CHADS_2$ score	82	https://www.mdcalc.com/calc/801/cha2ds2-vasc-score-atrial-fibrillation-stroke-risk#next-steps
2013 ATRIA[1]	Age (65–74 y is 3 points, 75–84 y is 5 points, ≥85 y is 6 points), hypertension, diabetes, CHF, proteinuria, GFR <45 mL/min/1.73 m^2, sex	Includes more age categories, renal function, and proteinuria More patients were classified as low or high risk but not as well tested in general.	11	https://www.mdcalc.com/calc/1842/atria-stroke-risk-score
2017 GARFIELD-AF[3]	Web-based, uses routinely collected clinical data, and includes a total of 16 questions	Web-based tool for predicting stroke and mortality, includes the effect of the different anticoagulants, bleeding risk and mortality to facilitate shared decision-making on the potential benefits/risks of anticoagulation	4	https://af.garfieldregistry.org/garfield-af-risk-calculator
2016 $MCHA_2DS_2$-VASc[26]	Expanded lower threshold for age to 50 y (1 point for age 50–74 y)	Validated in Asian cohort Can further identify Asian AF patients who may derive benefits from stroke prevention. In 1 study, $MCHA_2DS_2$-VASc was superior to CHA_2DS_2-VASc C-statistics = 0.708 (0.703–0.712) vs 0.689 (0.684–0.694)	1	

ATRIA indicates Anticoagulation and Risk Factors in Atrial Fibrillation: anemia, renal disease, elderly (age ≥75 y), any previous bleeding, hypertension; $CHADS_2$, congestive heart failure, hypertension, age >75 y, diabetes, stroke/transient ischemia attack/thromboembolism; CHA_2DS_2-VASc, indicates congestive heart failure, hypertension, age ≥75 y (doubled), diabetes mellitus, prior stroke or transient ischemic attack or thromboembolism (doubled), vascular disease, age 65 to 74 y, sex category; CHF, congestive heart failure; GARFIELD-AF, Global Anticoagulant Registry in the Field-Atrial Fibrillation; GFR, glomerular filtration rate; SPAF-III, stroke prevention atrial fibrillation, and TIA, transient ischemic attack.

Table 11. Additional Risk Factors That Increase Risk of Stroke Not Included in CHA_2DS_2-VASc

Higher AF burden/Long duration
Persistent/permanent AF versus paroxysmal
Obesity (BMI, ≥30 kg/m^2)
HCM
Poorly controlled hypertension
eGFR (<45 mL/h)
Proteinuria (>150 mg/24 h or equivalent)
Enlarged LA volume (≥73 mL) or diameter (≥4.7 cm)

AF indicates atrial fibrillation; BMI, body mass index; eGFR, estimated glomerular filtration rate; HCM, hypertrophic cardiomyopathy; and LA, left atrium.

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Risk-Based Selection of OAC: Balancing Risks & Benefits

COR	LOE	Recommendations
1	B-R	In patients diagnosed with AF who have an estimated **annual risk of stroke or thromboembolic events ≥ 2%,** selection of therapy to reduce the risk of stroke should be based on the risk of thromboembolism, **regardless of whether the AF pattern is paroxysmal, persistent, long-standing persistent, or permanent**.
1	B-NR	In patients with AF at risk for stroke, **reevaluation** of the need for and choice of stroke risk reduction therapy **at periodic intervals is recommended** to reassess stroke and bleeding risk, net clinical benefit, and proper dosing.

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Antithrombotic Therapy

COR	LOE	Recommendations
1	A	For patients with **AF and an estimated annual thromboembolic risk of ≥2% per year** (eg, CHA_2DS_2-VASc score of ≥2 in men and ≥3 in women), **anticoagulation is recommended** …
1	A	In **patients with AF who do not have a history of moderate to severe rheumatic mitral stenosis or a mechanical heart valve**, and who are candidates for anticoagulation, **DOACs are recommended over warfarin** …
2a	A	For **patients with AF and an estimated annual thromboembolic risk of ≥1% but <2% per year** (equivalent to CHA_2DS_2-VASc score of 1 in men and 2 in women), **anticoagulation is reasonable** …
3: Harm	B-R	In patients with AF who are candidates for anticoagulation and without an indication for antiplatelet therapy, **aspirin either alone or in combination with clopidogrel as an alternative to anticoagulation is not recommended to reduce stroke risk.**
3: No Benefit	B-NR	In **patients with AF without risk factors for stroke, aspirin monotherapy for prevention of thromboembolic events is of no benefit.**

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Summarized Recommendations

Annualized Stroke Risk	CHA_2DS_2-VASc	ATRIA	GARFIELD-AF	AC Therapy?
≥2%	≥ 2 in men ≥ 3 in women	7-15	≥1.60	**Recommended**
≥1% but <2%	1 in men 2 in women	6	0.9-1.59	**Reasonable***

*Consider factors that might modify risk of stroke to help inform decision (i.e. AF burden, lifestyle risk factors, see Table 3 for a full list)

Table used with permission from Candace Bryant, PharmD

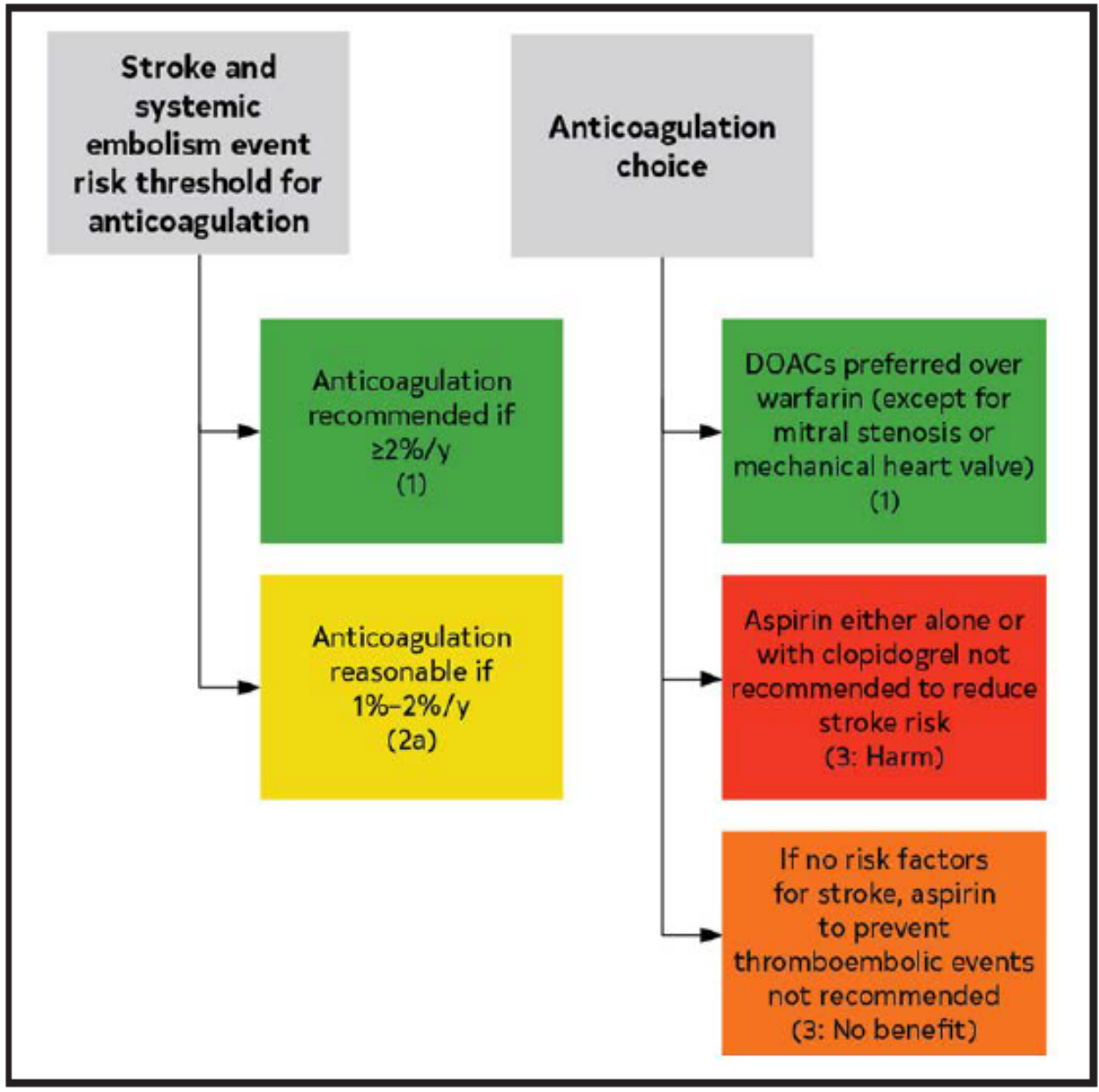

Figure 10. Antithrombotic Options in Patients With AF.
Colors correspond to Table 2. AF indicates atrial fibrillation; and DOAC, direct oral anticoagulant.

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Circulation. 2023 Aug 29;148(9):e9-e119.

Considerations in Managing Anticoagulants

COR	LOE	Recommendations
1	C-LD	For patients for with **AF receiving DOACs, optimal management of drug interactions is recommended** … (Table 13).
1	B-R	For patients with **AF receiving warfarin*, a target INR between 2 and 3 is recommended, as well as optimal management of drug-drug interactions, consistency in vitamin K dietary intake, and routine INR monitoring** …
3: Harm	B-NR	For patients with AF, **nonevidence-based doses of DOACs should be avoided to minimize risks of preventable thromboembolism or major bleeding and to improve survival.**

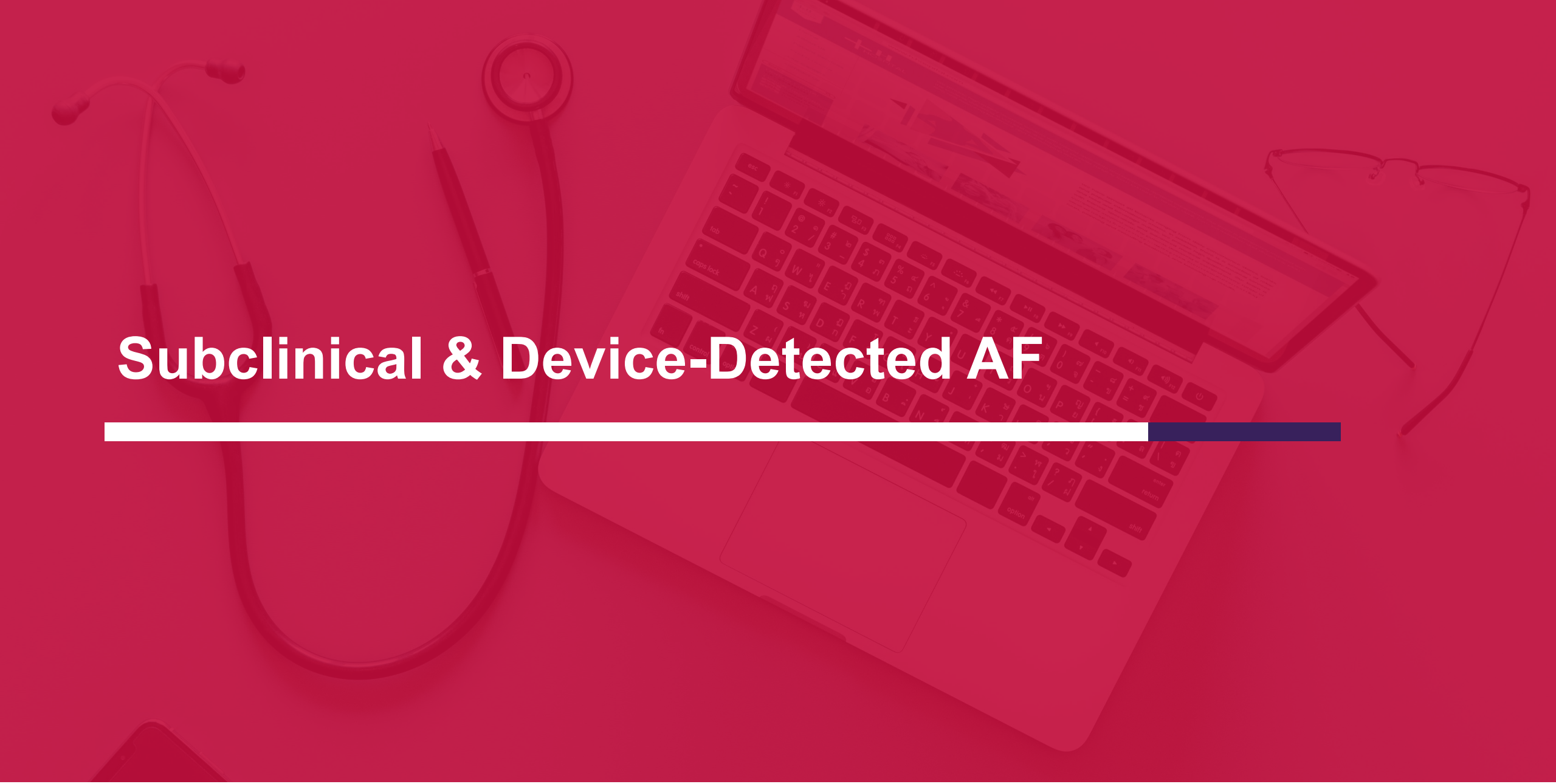
**Excludes patients with mechanical valves.*

Circulation. 2023 Aug 29;148(9):e9-e119.

Brief Discussion

Anastasia, what do you see as significant changes in the guidelines?

Subclinical & Device-Detected AF



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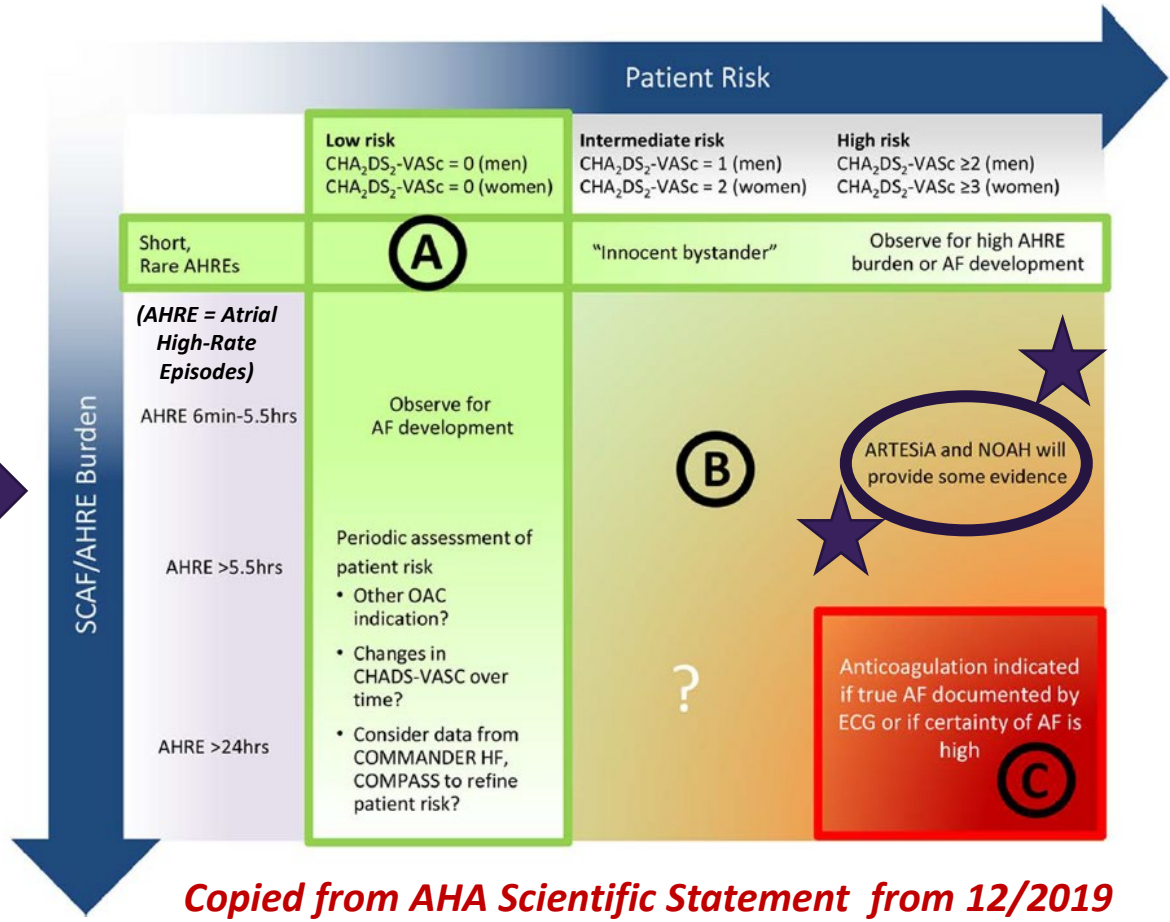
Consideration of OAC for Device-Detected AHREs According to Patient Stroke Risk by CHA_2DS_2-VASc Score and Episode Duration

6.4.1. Oral Anticoagulation for Device-Detected Atrial High-Rate Episodes Among Patients Without a Previous Diagnosis of AF

Recommendations for Oral Anticoagulation for Device-Detected Atrial High-Rate Episodes Among Patients Without a Previous Diagnosis of AF Referenced studies that support the recommendations are summarized in the Online Data Supplement.

COR	LOE	Recommendations
2a	B-NR	1. For patients with a device-detected atrial high-rate episode (AHRE) lasting ≥24 hours[1] and with a CHA_2DS_2-VASc score ≥2 or equivalent stroke risk,[2] it is reasonable to initiate oral anticoagulation[3] within a SDM framework that considers episode duration and individual patient risk.
2b	B-NR	2. For patients with a device-detected AHRE lasting between 5 minutes and 24 hours and with a CHA_2DS_2-VASc score ≥3 or equivalent stroke risk,[2] it may be reasonable to initiate anticoagulation within a SDM framework that considers episode duration and individual patient risk.
3: No Benefit	B-NR	3. Patients with a device-detected AHRE lasting <5 minutes and without another indication for oral anticoagulation should not receive oral anticoagulation.[4,5]

Note difference in timing cut-points



Copied from AHA Scientific Statement from 12/2019

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Circulation. 2023 Aug 29;148(9):e9-e119.

ORIGINAL ARTICLE

Apixaban for Stroke Prevention in Subclinical Atrial Fibrillation

ARTESiA

- **Trial Design:** Randomized, double-blind, double-dummy trial of patients with at least one episode of device-detected SCAF lasting ≥ 6 min to < 24 hrs
  - 4,012 patients w/ CHA_2DS_2-VASc of 3 or higher from 247 sites across 16 countries
  - Apixaban vs. ASA 81mg
  - If AF lasting > 24hrs or clinical AF developed, study drug was discontinued, open-label AC was initiated, and f/u was continued
- **Primary Outcomes:**
  - **Efficacy:** Composite of stroke & systemic embolism (SSE)
  - **Safety:** ISTH Major Bleeding

N Engl J Med. 2024 Jan 11;390(2):107-117.

ARTESIA Results

- **Apixaban vs. ASA:**
  - 37%↓ in SSE (*NNT ~172*)
    - 49%↓ in disabling or fatal stroke
      - *45% of stokes in the ASA arm resulted in death or long-term disability*
  - 80%↑ in major bleeding (*NNH ~ 130*)
    - *Apixaban did not result in substantially higher rates of transfusion, fatal bleeding, hemorrhagic stroke, or ICH compared to ASA*
      - *90% of all apixaban-related bleeds were managed w/ nonprocedural measures only*

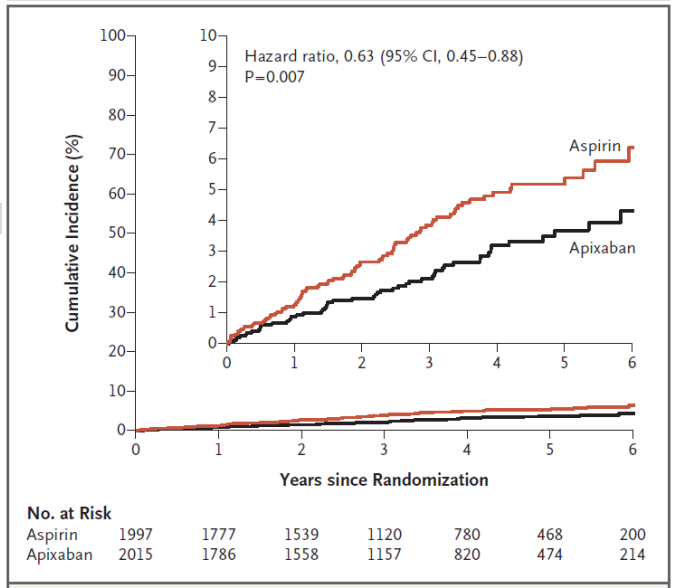

Figure 1. Stroke or Systemic Embolism (Primary Efficacy Outcome).

- ***Things that make Arthur scratch his bald head …***
  - All patients w/ AF <24 hrs lumped together
    - No outcomes by the SCAF durations outlined in baseline characteristics table (1)
  - Nearly 1/4th of pts had trial meds d/ced 2/2 SCAF > 24hrs or clinical AF w/ median time to d/c = 18.3 months (interquartile range 8.5 – 34 months)
  - More than 1/3rd of enrollees in each group had trial meds discontinued for other reasons?

Table 1. (Continued.)

Characteristic	Apixaban (N=2015)	Aspirin (N=1997)	Total (N=4012)
Longest episode of SCAF in past 6 mo — no./total no. (%)			
No episodes	317/2012 (15.8)	315/1995 (15.8)	632/4007 (15.8)
<6 Min	42/2012 (2.1)	43/1995 (2.2)	85/4007 (2.1)
6 Min to <1 hr	535/2012 (26.6)	497/1995 (24.9)	1032/4007 (25.8)
1 to <6 Hr	681/2012 (33.8)	743/1995 (37.2)	1424/4007 (35.5)
6 to <12 Hr	287/2012 (14.3)	264/1995 (13.2)	551/4007 (13.8)
12 to 24 Hr	150/2012 (7.5)	133/1995 (6.7)	283/4007 (7.1)

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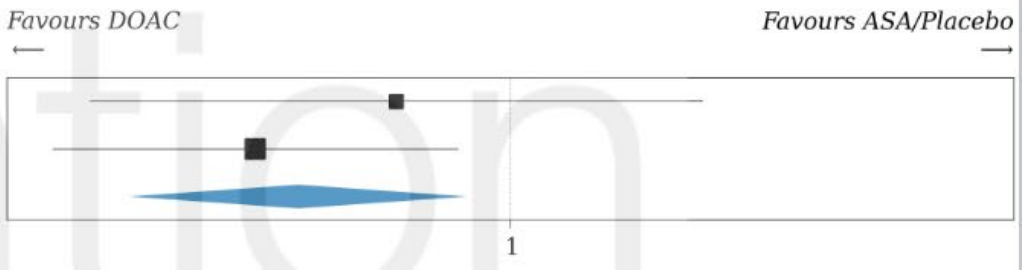
N Engl J Med. 2024 Jan 11;390(2):107-117.

Direct Oral Anticoagulants for Stroke Prevention in Patients with Device-Detected Atrial Fibrillation: A Study-Level Meta-Analysis of the NOAH-AFNET 6 and ARTESiA Trials

Ischemic Stroke

Study	DOAC	(%)	ASA/Placebo	(%)	Weight	RR [95% CI]
NOAH-AFNET 6	22/1,270	(1.7%)	27/1,266	(2.1%)	30.4%	0.81 [0.47, 1.42]
ARTESiA	45/2,015	(2.2%)	71/1,997	(3.6%)	69.6%	0.63 [0.43, 0.91]
Pooled Estimate	67/3,285	(2.0%)	98/3,263	(3.0%)	I^2: 0%	0.68 [0.5, 0.92]

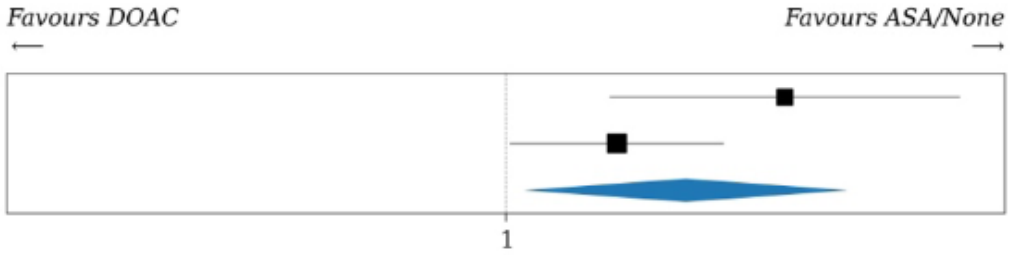
Mantel-Haenszel, DerSimonian-Laird Random Effects
p=0.01, z=2.47
τ^2=0.00
RR: Risk Ratio
CI: Confidence Interval



Major Bleeding

Study	DOAC	(%)	ASA/None	(%)	Weight	RR [95% CI]
NOAH-AFNET 6	53/1,270	(4.2%)	25/1,266	(2.0%)	41.1%	2.11 [1.32, 3.38]
ARTESiA	106/2,015	(5.3%)	78/1,997	(3.9%)	58.9%	1.35 [1.01, 1.79]
Pooled Estimate	159/3,285	(4.8%)	103/3,263	(3.2%)	I^2: 61%	1.62 [1.05, 2.5]

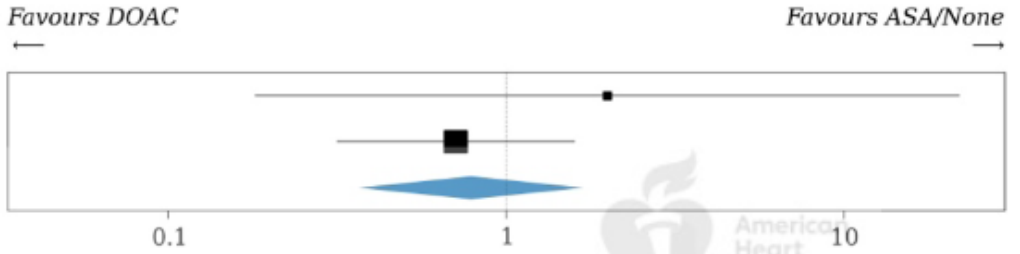
Mantel-Haenszel, DerSimonian-Laird Random Effects
p=0.03, z=2.18
τ^2=0.06
RR: Risk Ratio
CI: Confidence Interval



Fatal Bleeding

Study	DOAC	(%)	ASA/None	(%)	Weight	RR [95% CI]
NOAH-AFNET 6	2/1,270	(0.2%)	1/1,266	(0.1%)	10.2%	1.99 [0.18, 21.96]
ARTESiA	10/2,015	(0.5%)	14/1,997	(0.7%)	89.8%	0.71 [0.32, 1.59]
Pooled Estimate	12/3,285	(0.4%)	15/3,263	(0.5%)	I^2: 0%	0.79 [0.37, 1.69]

Mantel-Haenszel, DerSimonian-Laird Random Effects
p=0.54, z=0.61
τ^2=0.00
RR: Risk Ratio
CI: Confidence Interval



Circulation. 2023 Nov 12. doi: 10.1161/CIRCULATIONAHA.123.067512.

Brief Discussion

Renato, can you give us the skinny on SCAF?!

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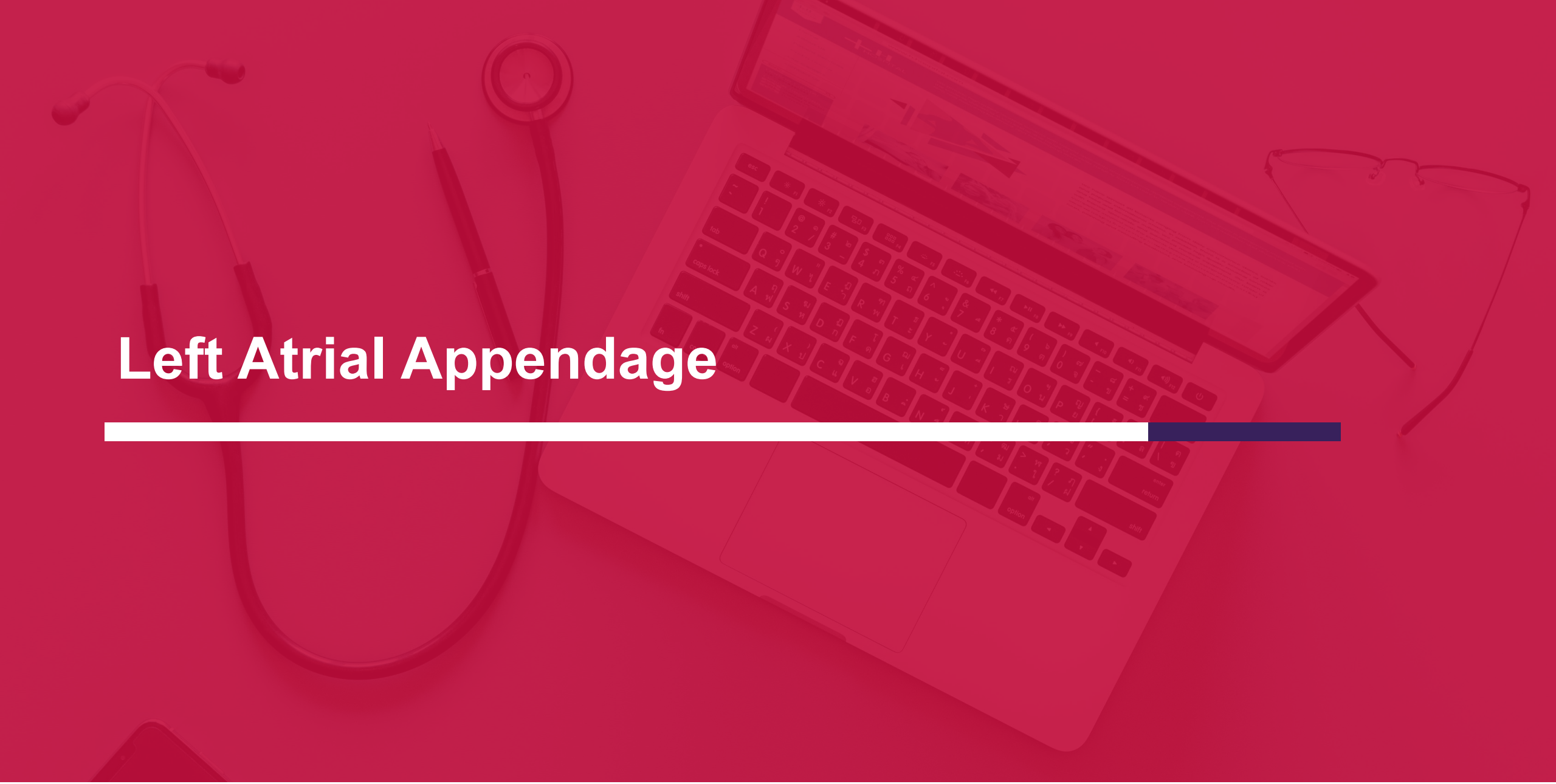
Left Atrial Appendage



Left Atrial Appendage Occlusion

COR	LOE	Recommendations
2a	B-NR	In **patients with AF, a moderate to high risk of stroke** (CHA_2DS_2-VASc score ≥2), **and a contraindication** (Table 14) **to long-term oral anticoagulation due to a nonreversible cause, percutaneous LAAO (pLAAO) is reasonable**.
2b	B-R	In **patients with AF and a moderate to high risk of stroke and a high risk of major bleeding on oral anticoagulation, pLAAO may be a reasonable alternative to oral anticoagulation based on patient preference**, with careful consideration of procedural risk and with the understanding that the evidence for oral anticoagulation is more extensive.

Table 14. Situations in Which Long-Term Anticoagulation Is Contraindicated and Situations When It Remains Reasonable

Long-Term Anticoagulation Contraindicated	Long-Term Anticoagulation Is Still Reasonable
Severe bleeding due to a nonreversible cause involving the gastrointestinal, pulmonary, or genitourinary systems	Bleeding involving the gastrointestinal, pulmonary, or genitourinary systems that is treatable
Spontaneous intracranial/intraspinal bleeding due to a nonreversible cause	Bleeding related to isolated trauma
Serious bleeding related to recurrent falls when cause of falls is not felt to be treatable	Bleeding related to procedural complications

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Cardiac Surgery – LAA Exclusion/Excision

COR	LOE	Recommendations
1	A	In **patients with AF undergoing cardiac surgery with a CHA_2DS_2-VASc score ≥2 or equivalent stroke risk, surgical LAA exclusion, in addition to continued anticoagulation, is indicated** to reduce the risk of stroke and systemic embolism.
1	A	In patients with AF undergoing cardiac surgery and LAA exclusion, a surgical technique resulting in absence of flow across the suture line and a stump of <1 cm as determined by intraoperative transesophageal echocardiography should be used.
2b	A	In **patients with AF undergoing cardiac surgery with CHA_2DS_2-VASc score ≥2 or equivalent stroke risk, the benefit of surgical LAA exclusion in the absence of continued anticoagulation to reduce the risk of stroke and systemic embolism is uncertain.**

Pssst … surgical LAA exclusion ain't the same as LAAO!

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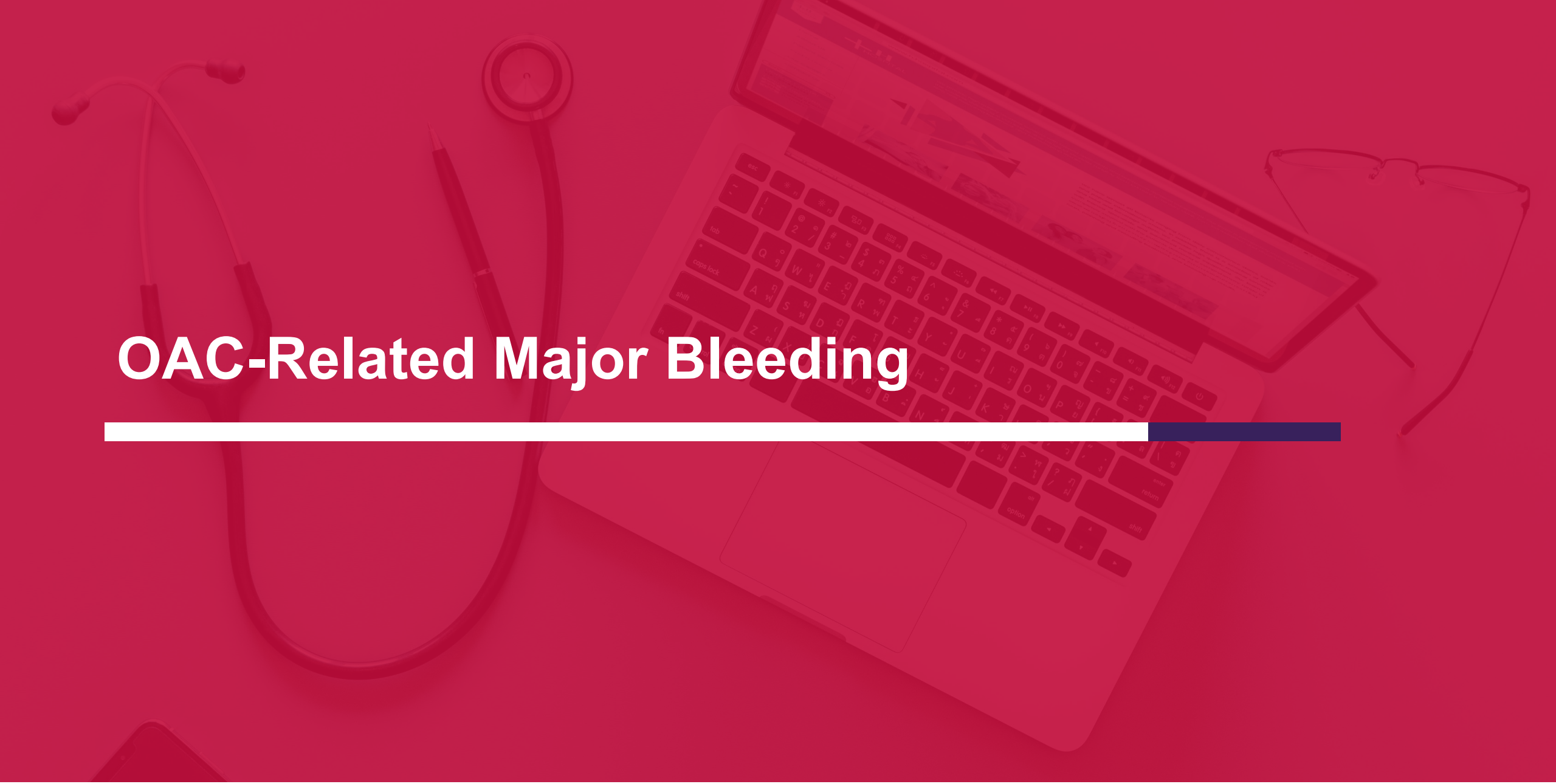
OAC-Related Major Bleeding



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OAC-Related Life-Threatening Bleeding

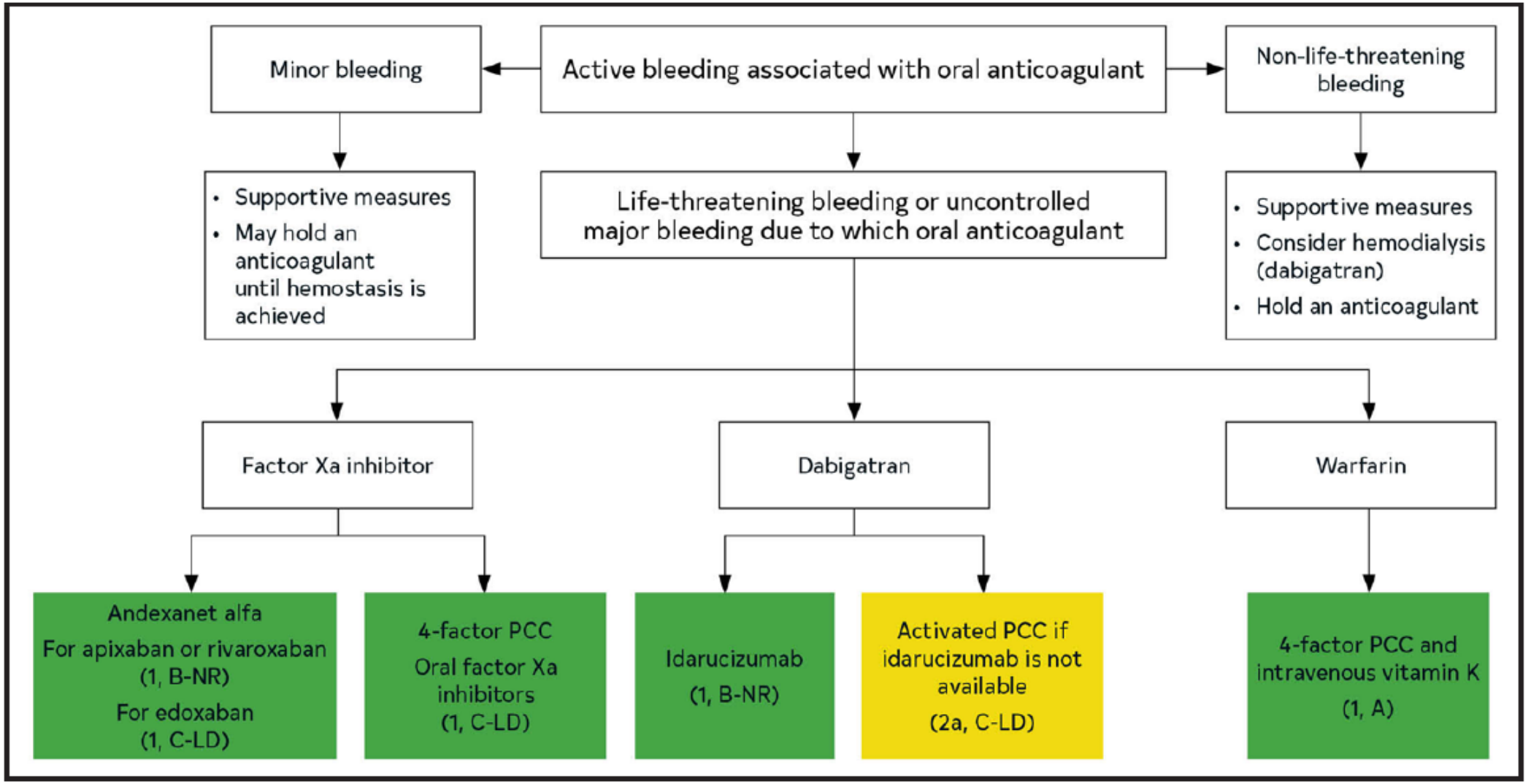

Figure 13. Active Bleeding Associated With Oral Anticoagulant.
Colors correspond to Table 2. PCC indicates prothrombin complex concentrate.

Circulation. 2023 Aug 29;148(9):e9-e119.

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Resumption of OAC After a Bleed

- **Major GIB:**
  - *… **resumption of OAC may be reasonable after correction of reversible causes of bleeding** and reassessment of its long-term benefits and risks … **SDM** with patients. (2b; B-NR)*

- **ICH:**
  - *… AF and conditions associated with very high risk of thromboembolic events (**>5%/year**), **such as rheumatic heart disease or mechanical heart valve**, **early (1-2 weeks) resumption** of OAC after ICH is reasonable … (2a; C-LD)*
  - *… AF and ICH, **delayed (4-8 weeks) resumption** of OAC may be considered … after careful risk benefit assessment. (2b; C-LD)*
  - *… AF and **conditions associated with high risk of recurrent ICH** (eg, cerebral amyloid angiopathy) **anticoagulation sparring strategies** (eg, LAAO) may be considered … (2b; B-NR)*

Circulation. 2023 Aug 29;148(9):e9-e119.

TE & Recurrent ICH Risk Factors

Table 17. Risk Factors for Thromboembolic Complications and Recurrent ICH

Factors Associated With High Risk of Thromboembolism	Factors Associated With High Risk of Recurrent ICH
Mechanical heart valve	Suspected cerebral amyloid angiopathy
Rheumatic valve disease	Lobar IPH
Previous history of stroke/ thromboembolism	Older age
Hypercoagulable state (eg, active malignancy, genetic thrombophilia)	>10 cerebral microbleeds on MRI
High CHA_2DS_2-VASc score (>5)	Disseminated cortical superficial siderosis on MRI
	Poorly controlled hypertension
	Previous history of spontaneous ICH
	Genetic/acquired coagulopathy
	Untreated symptomatic vascular malformation or aneurysm

CHA_2DS_2-VASc indicates congestive heart failure, hypertension, age ≥75 y (doubled), diabetes mellitus, prior stroke or transient ischemic attack or thromboembolism (doubled), vascular disease, age 65 to 74 y, sex category; ICH, intracranial hemorrhage; IPH, intraparenchymal hemorrhage; and MRI, magnetic resonance imaging.

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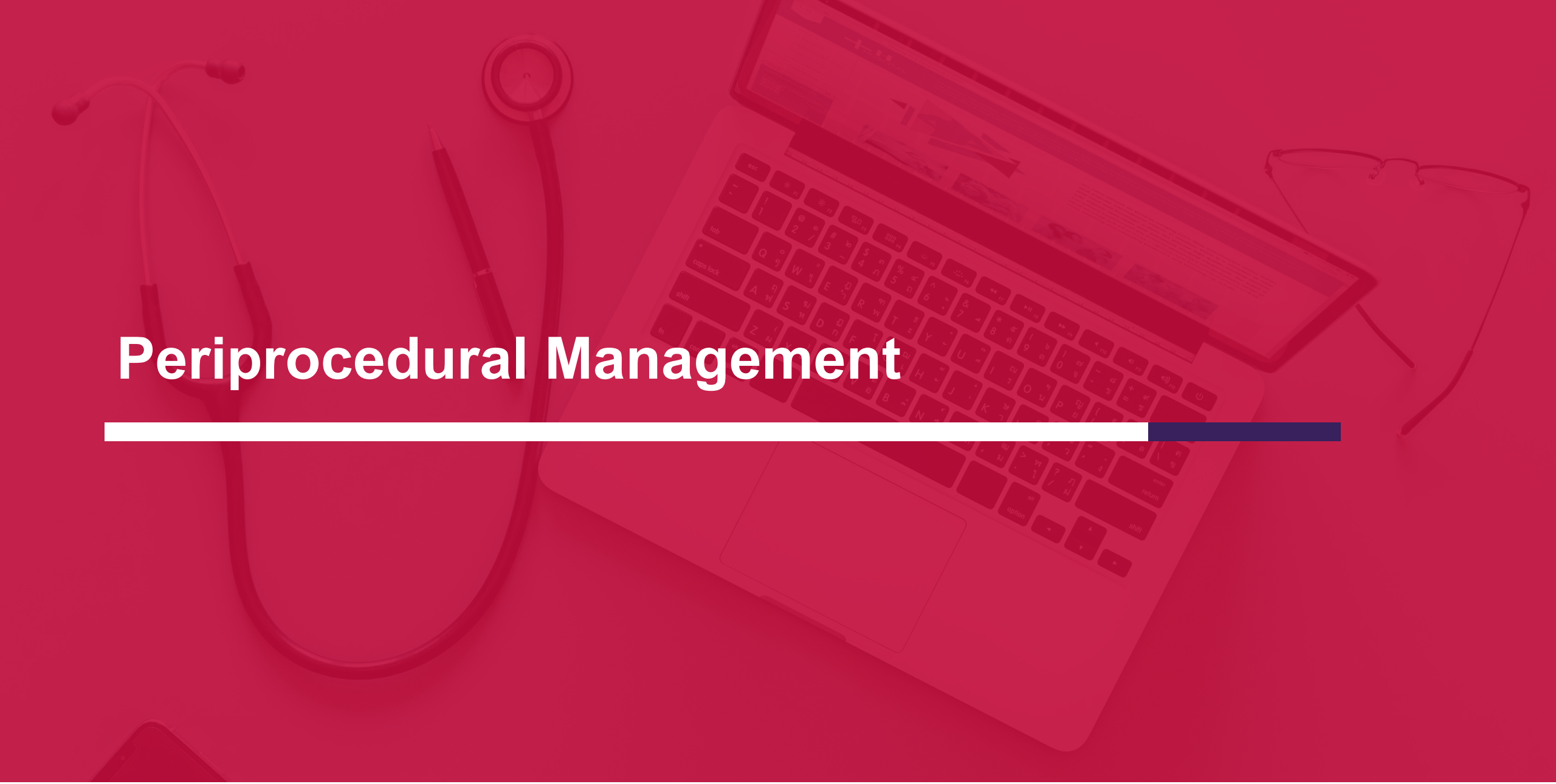
Periprocedural Management



Periprocedural Management Flowchart

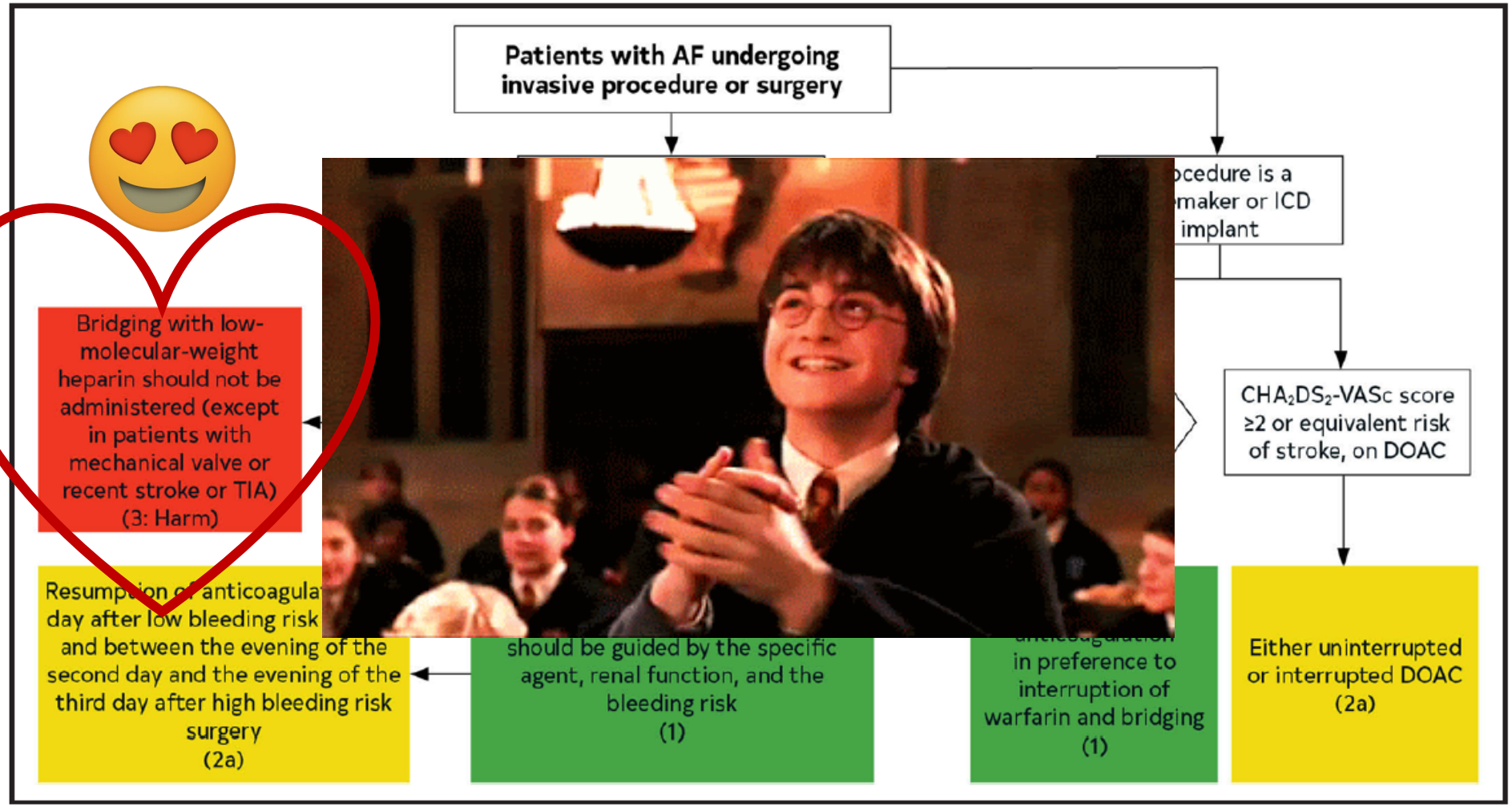


Figure 15. Flowchart: Management of Periprocedural Anticoagulation in Patients With AF.
Colors correspond to Table 2. AF indicates atrial fibrillation; CHA_2DS_2-VASc, congestive heart failure, hypertension, age ≥75 y (doubled), diabetes mellitus, prior stroke or transient ischemic attack or thromboembolism (doubled), vascular disease, age 65 to 74 y, sex category; DOAC, direct oral anticoagulant; ICD, implantable cardioverter-defibrillator; TE, thromboembolism; and TIA, transient ischemic attack.

Circulation. 2023 Aug 29;148(9):e9-e119.

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Where have I heard this before? 🤔

Cardiovascular Perspective

A Call to Reduce the Use of Bridging Anticoagulation

Adam J. Rose, MD, MSc; Arthur L. Allen, PharmD, CACP; Tracy Minichello, MD

Abstract—Because of the recent publication of several important studies, there has been a major change in how we think about perioperative management of anticoagulation. Because of these changes, existing consensus guidelines are suddenly out of date and can no longer be used as-is, particularly the 2012 American College of Chest Physicians Antithrombotic Guidelines, version 9. We estimate that well over 90% of patients receiving warfarin therapy should not receive bridging anticoagulation during periprocedural interruptions of therapy, except under unusual circumstances and with appropriate justification. Accumulating evidence also suggests that bridging is not indicated among patients receiving direct-acting oral anticoagulant therapy. The large number of patients potentially affected represents an important safety concern and requires an immediate change in practice. (*Circ Cardiovasc Qual Outcomes.* **2016;9:00-00. DOI: 10.1161/CIRCOUTCOMES.115.002430.)**

We feel confident in saying …that the overwhelming majority of patients will receive net harm from bridging.

Timing of OAC Discontinuation

Table 18. Timing of Discontinuation of OACs in Patients With AF Scheduled to Undergo an Invasive Procedure or Surgery in Whom Anticoagulation Is to Be Interrupted

Anticoagulant	Low Bleeding Risk Procedure	High Bleeding Risk Procedure
Apixaban (CrCl >25 mL/min)*	1 d†	2 d
Dabigatran (CrCl >50 mL/min)	1 d	2 d
Dabigatran (CrCl 30-50 mL/min)	2 d	4 d
Edoxaban (CrCl >15 mL/min)	1 d	2 d
Rivaroxaban (CrCl >30 mL/min)	1 d	2 d
Warfarin	5 d for a target INR <1.5 2-3 d for a target INR <2	5 d

*For patients on DOAC with creatinine clearance lower than the values in the table, few clinical data exist. Consider holding for an additional 1 to 3 days, especially for high bleeding risk procedures.

†The number of days is the number of full days before the day of surgery in which the patient does not take any dose of anticoagulant. The drug is also not taken the day of surgery. For example, in the case of holding a twice daily drug for 1 day, if the drug is taken at 8 pm, and surgery is at 8 am, at the time of surgery, it will be 36 hours since the last dose was taken.

AF indicates atrial fibrillation; CrCl, creatinine clearance; DOAC, direct oral anticoagulation; INR, international normalized ratio; and OAC, oral anticoagulant.

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Brief Discussion

… we've checked the DSM and can't find a phobia for "fear of LMWH bridging" but pretty sure Arthur has it…

Special Populations

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Coronary Artery Disease (CAD) & Peripheral Artery Disease (PAD)

- **AF patients w CAD undergoing PCI**
  - ***DOACs preferred*** *over VKAs in combination with APT (1; A)*
  - *Early discontinuation of ASA (1-4 weeks) and continuation of dual antithrombotic therapy with OAC and a P2Y12 inhibitor is preferred over triple therapy (1; A)*

- **Chronic Coronary Disease (CCD)**
  - *… AF and CCD (**beyond 1 year** after revascularization or CAD not requiring coronary revascularization) without history of stent thrombosis, **oral anticoagulation monotherapy** is recommended over the combination therapy of OAC and single APT (aspirin or P2Y12 inhibitor) ... (1; B-R)*

- **PAD**
  - *… AF and concomitant **stable PAD, monotherapy oral anticoagulation is reasonable** over dual therapy (anticoagulation plus aspirin or P2Y12 inhibitors) ... (2a; B-NR)*

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Chronic Kidney Disease (CKD)/Kidney Failure

- **CKD Stage 3: …** *warfarin,* ***or preferably evidence-based doses of direct thrombin or factor Xa inibitors*** *is recommended … (1; B-R)*
- **CKD Stage 4:** *… **warfarin or labeled doses of DOACs** is reasonable … (2a; B-NR)*
- **End-Stage CKD (CrCl < 15ml/min) or on dialysis:** ***it might be reasonable*** *to prescribed warfarin (INR 2.0-3.0) or an* ***evidence-based dose*** *of apixaban … (2b; B-NR)*

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Class III Obesity & Bariatric Surgery

- **Class III Obesity (BMI ≥ 40kg/m^2)**
  - *… AF and class III obesity …* ***DOACs are reasonable to choose over warfarin*** *...(2a; B-NR)*
- **Patients who have undergone bariatric surgery**
  - *…* ***warfarin may be reasonable to choose over DOACs*** *…in view of concerns about DOAC drug absorption (2b; C-LD)*

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Valvular Heart Disease

- **Rheumatic mitral stenosis or mitral stenosis of moderate or greater severity**
  - *Warfarin recommended over DOACs independent of CHA_2DS_2-VASc score (1; B-R)*
- **Valvular disease other than moderate or greater mitral stenosis or mechanical heart valve**
  - *DOACs recommended over VKAs (1; B-NR)*

Note the difference between language used here and that used in the "Antithrombotic Therapy" section presented earlier.

COR	LOE	Recommendations
1	A	For patients with **AF and an estimated annual thromboembolic risk of ≥2% per year** (eg, CHA2DS2-VASc score of ≥2 in men and ≥3 in women), **anticoagulation is recommended** …
1	A	In **patients with AF who do not have a history of moderate to severe rheumatic mitral stenosis or a mechanical heart valve,** and who are candidates for anticoagulation, **DOACs are recommended over warfarin** …

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Typical Atrial Flutter

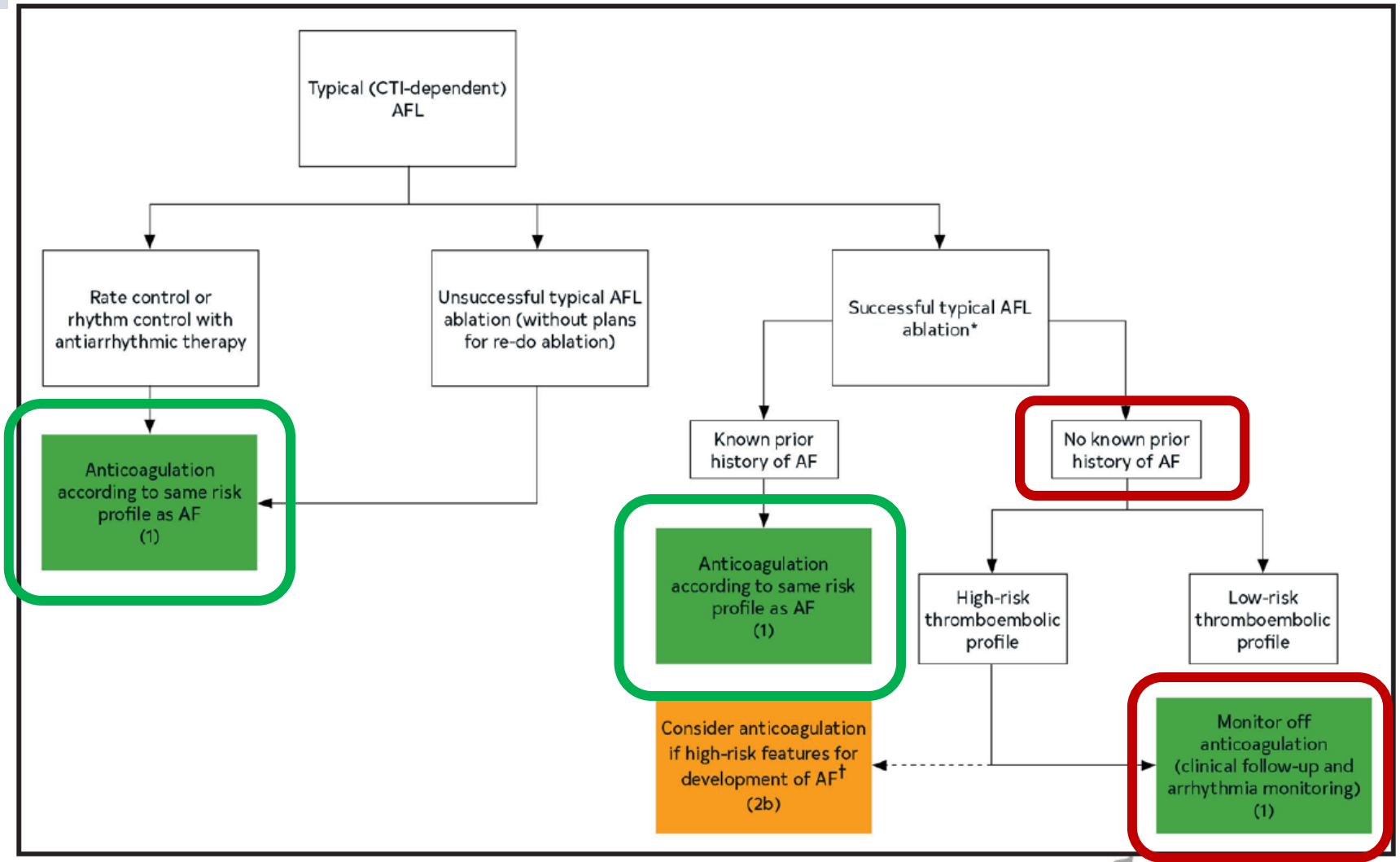

Figure 16. Anticoagulation for Typical (CTI-Dependent) AFL

*Intraprocedural documentation of bidirectional block. †For example, left atrial enlargement, inducible AF, COPD, concomitant heart failure. Colors correspond to Table 2. AF indicates atrial fibrillation; AFL, atrial flutter; COPD, chronic obstructive pulmonary disease; and CTI, cavotricuspid isthmus.

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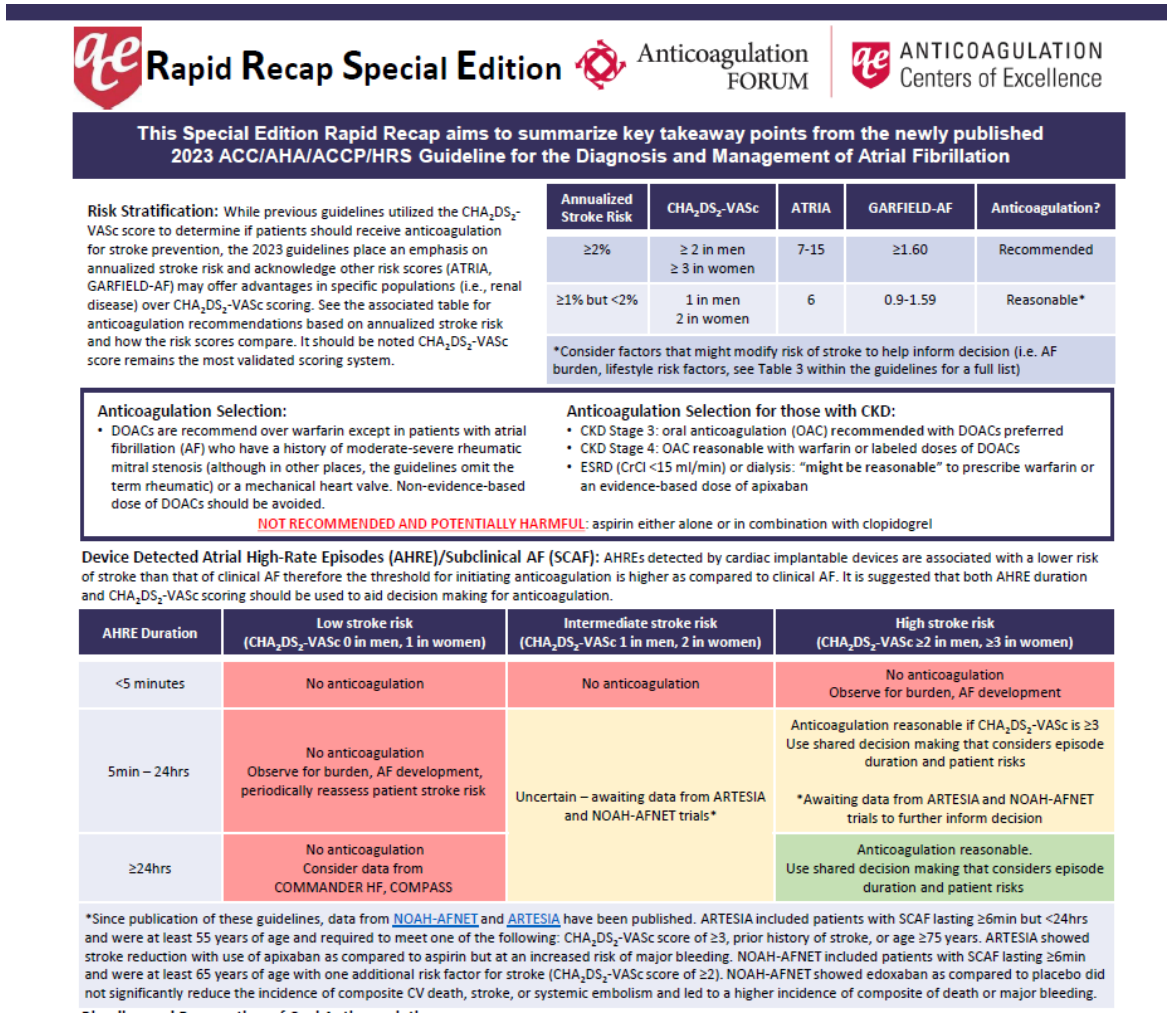
Other cool stuff we don't have time to discuss …

- AF in the setting of:
  - Cardiac surgery (prevention & treatment)
  - Medical illness or surgery
  - Hyperthyroidism
  - Pregnancy
  - Liver Disease
- TE prevention in the setting of rhythm control
  - Cardioversion & Catheter Ablation
- Surgical Ablation
- Cardio-Oncology and AC considerations
- *… and so much more …*

Want a one-page summary of key take aways?

Check out our [Special Edition Rapid Recap](#)!



Rapid Recap Special Edition

Anticoagulation FORUM | ANTICOAGULATION Centers of Excellence

This Special Edition Rapid Recap aims to summarize key takeaway points from the newly published 2023 ACC/AHA/ACCP/HRS Guideline for the Diagnosis and Management of Atrial Fibrillation

Risk Stratification: While previous guidelines utilized the CHA_2DS_2-VASc score to determine if patients should receive anticoagulation for stroke prevention, the 2023 guidelines place an emphasis on annualized stroke risk and acknowledge other risk scores (ATRIA, GARFIELD-AF) may offer advantages in specific populations (i.e., renal disease) over CHA_2DS_2-VASc scoring. See the associated table for anticoagulation recommendations based on annualized stroke risk and how the risk scores compare. It should be noted CHA_2DS_2-VASc score remains the most validated scoring system.

Annualized Stroke Risk	CHA_2DS_2-VASc	ATRIA	GARFIELD-AF	Anticoagulation?
≥2%	≥ 2 in men ≥ 3 in women	7-15	≥1.60	Recommended
≥1% but <2%	1 in men 2 in women	6	0.9-1.59	Reasonable*

*Consider factors that might modify risk of stroke to help inform decision (i.e. AF burden, lifestyle risk factors, see Table 3 within the guidelines for a full list)

Anticoagulation Selection:
- DOACs are recommend over warfarin except in patients with atrial fibrillation (AF) who have a history of moderate-severe rheumatic mitral stenosis (although in other places, the guidelines omit the term rheumatic) or a mechanical heart valve. Non-evidence-based dose of DOACs should be avoided.

Anticoagulation Selection for those with CKD:
- CKD Stage 3: oral anticoagulation (OAC) **recommended** with DOACs preferred
- CKD Stage 4: OAC **reasonable** with warfarin or labeled doses of DOACs
- ESRD (CrCl <15 ml/min) or dialysis: **"might be reasonable"** to prescribe warfarin or an evidence-based dose of apixaban

NOT RECOMMENDED AND POTENTIALLY HARMFUL: aspirin either alone or in combination with clopidogrel

Device Detected Atrial High-Rate Episodes (AHRE)/Subclinical AF (SCAF): AHREs detected by cardiac implantable devices are associated with a lower risk of stroke than that of clinical AF therefore the threshold for initiating anticoagulation is higher as compared to clinical AF. It is suggested that both AHRE duration and CHA_2DS_2-VASc scoring should be used to aid decision making for anticoagulation.

AHRE Duration	Low stroke risk (CHA_2DS_2-VASc 0 in men, 1 in women)	Intermediate stroke risk (CHA_2DS_2-VASc 1 in men, 2 in women)	High stroke risk (CHA_2DS_2-VASc ≥2 in men, ≥3 in women)
<5 minutes	No anticoagulation	No anticoagulation	No anticoagulation Observe for burden, AF development
5min – 24hrs	No anticoagulation Observe for burden, AF development, periodically reassess patient stroke risk	Uncertain – awaiting data from ARTESIA and NOAH-AFNET trials*	Anticoagulation reasonable if CHA_2DS_2-VASc is ≥3 Use shared decision making that considers episode duration and patient risks *Awaiting data from ARTESIA and NOAH-AFNET trials to further inform decision
≥24hrs	No anticoagulation Consider data from COMMANDER HF, COMPASS		Anticoagulation reasonable. Use shared decision making that considers episode duration and patient risks

*Since publication of these guidelines, data from NOAH-AFNET and ARTESIA have been published. ARTESIA included patients with SCAF lasting ≥6min but <24hrs and were at least 55 years of age and required to meet one of the following: CHA_2DS_2-VASc score of ≥3, prior history of stroke, or age ≥75 years. ARTESIA showed stroke reduction with use of apixaban as compared to aspirin but at an increased risk of major bleeding. NOAH-AFNET included patients with SCAF lasting ≥6min and were at least 65 years of age with one additional risk factor for stroke (CHA_2DS_2-VASc score of ≥2). NOAH-AFNET showed edoxaban as compared to placebo did not significantly reduce the incidence of composite CV death, stroke, or systemic embolism and led to a higher incidence of composite of death or major bleeding.

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Q & A Session

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Moderators & Presenter

Arthur Allen, PharmD, CACP (Presenter)
Anticoagulation Program Manager
VA Salt Lake City Health Care System

Andrea Van Beek, DNP, APRN, AGPCNP-BC, CACP
Nurse Practitioner, Anticoagulation and Thrombosis Service
Visalia Medical Clinic/Adventist Health Physicians Network

Panelists

Anastasia Armbruster, PharmD, FACC, BCCP
Professor of Pharmacy Practice
St. Louis College of Pharmacy at UHSP

Renato D. Lopes, MD, MHS, PhD
Professor of Medicine
Division of Cardiology
Duke University Health System

March Webinars

Thrombosis and Antithrombotic Care in the Hispanic Community

Tuesday | March 19, 2024 | 12:00pm ET

Hosted by the AC Forum IDEA Initiative Committee

Presenter: Alfonso Tafur, MD, MS, MBA, NorthShore University Health Systems

Moderator: Julia Bayadinova, NP, MN, St. Joseph's Healthcare Hamilton

Anticoagulants in Older Adults

Thursday | March 28, 2024 | 12:00pm ET

Presenter: Allison Burnett, PharmD, PhC, CACP, University of New Mexico Hospital

Moderator: Andrea Van Beek, DNP, APRN, AGPCNP-BC, CACP, Visalia Medical Clinic/Adventist Health Physicians Network

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