

Anticoagulation Management Update

Alvin B. Lin, MD, FAAFP



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Alvin B. Lin, MD, FAAFP

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Dr. Lin completed his medical degree at the Bowman Gray School of Medicine (now the Wake Forest School of Medicine) in Winston-Salem, North Carolina, and completed his family medicine residency at Merrithew Memorial Hospital, Martinez, California, which is part of the UC Davis School of Medicine network of affiliated residency programs. For three years, he gained experience as a locum tenens physician, working under a dozen state licenses. He completed a fellowship in geriatric medicine at Pitt County Memorial Hospital, Greenville, North Carolina, in conjunction with the Brody School of Medicine at East Carolina University, and then joined the faculty for five years. Subsequently, he was recruited to advance the science of hypogonadism and healthy aging in a private, cash-based practice in Las Vegas, Nevada. He restarted his academic career part-time at the University of Nevada School of Medicine (now the UNLV School of Medicine) and then joined the full-time faculty in 2010, advancing to associate professor of family medicine from 2012 to 2016. In October 2016, Dr. Lin made the leap to solo practice. He lectures for the Nevada Academy of Family Physicians, chairs the AAFP's Geriatric Medicine Live Course, and serves as faculty for the AAFP's Care of Chronic Conditions Live Course and for various Knowledge Self-Assessments (KSAs).

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Learning Objectives

1. Utilize a systematic process of care, including initiation and assessment of therapy and dosing adjustments, to optimize effectiveness and minimize adverse effects of patients taking warfarin.
2. Consider new agents in patients, with atrial fibrillation and at least one other risk factor for stroke, that do not require frequent laboratory monitoring are as effective as warfarin for prevention of stroke or systemic embolism and have comparable risks of major bleeding.
3. Develop collaborative care plans with patient education to counsel patients on safe and effective self-administration of anticoagulants, emphasizing self-monitoring to prevent complications.
4. Establish or revise existing practice-level protocols for anticoagulation management, based on current evidence-based recommendations and guidelines, including having clearly defined staff roles and responsibilities.

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Audience Engagement System

The image displays three sequential screenshots of a mobile application interface, labeled Step 1, Step 2, and Step 3, illustrating the Audience Engagement System workflow.

Step 1: The 'Dashboard' screen shows a grid of icons for 'My Schedule', 'CME/Events', 'Faculty', and 'Exhibit Hall'. An arrow points from the 'CME/Events' icon to the next screen.

Step 2: The 'CME/Events' screen shows a calendar view for the week of October 9th to 13th. A list of events is displayed, with an arrow pointing to the first event: 'CME041 (PBL) Arrhythmias and Dysrhythmias' at 3:00 PM in Room 217.

Step 3: The 'CME/Event' detail screen for 'CME041 (PBL) Arrhythmias and Dysrhythmias' is shown. It includes details such as 'Location: Room 217', 'Date: Friday, Oct 12 3:00 PM', and 'Duration: 1 hour'. Below the details are two buttons: 'Audience Engagement System' and 'CME Report / Evaluation'. An arrow points from the 'Audience Engagement System' button to the text below.

The text below the buttons reads: '1. Practice applying new knowledge and skills gained from Arrhythmias and Dysrhythmias sessions, through collaborative learning with peers and expert faculty. 2. Identify strategies that foster optimal management of arrhythmias and dysrhythmias, within the context of...'. A 'Show more' link is visible at the bottom right of the text.

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Acronyms

- DAPT
 - Dual antiplatelet therapy
- DOAC/NOAC
 - Direct/novel oral anticoagulant
- DVT
 - Deep vein/venous thrombosis

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Acronyms

- INR
 - International normalized ratio
- LMWH
 - Low molecular weight heparin

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Acronyms

- PE
 - Pulmonary embolism
- UFH
 - Unfractionated heparin
- VKA
 - Vitamin K antagonist
- VTE
 - Venous thromboembolism

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AES Question #1

How much time must elapse from Food & Drug Administration (FDA) approval of a new medication before you're comfortable using said "new" medication

- a) 1 year
- b) 2 years
- c) 5 years
- d) 10 years
- e) I don't trust the FDA

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When is new no longer new?

- Warfarin (Coumadin & Jantoven)
 - Approved 1954
 - Vitamin K antagonist (VKA)
 - Requires
 - Strict diet
 - Regular monitoring
- Novel (?) or direct oral anticoagulants (NOAC/DOAC)
 - Approved 2010 & more recently

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When is new no longer new?

- Dabigatran (Pradaxa)
 - Approved October 2010
- Rivaroxaban (Xarelto)
 - Approved July 2011
- Apixaban (Eliquis)
 - Approved December 2012
- Edoxaban (Savaysa)
 - Approved January 2015

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Utilize a systematic process of care, including initiation & assessment of therapy and dosing adjustments, to optimize effectiveness and minimize adverse effects of patients taking warfarin

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AES Question #2

What is not considered a risk factor for stroke in atrial fibrillation?

- a) Diabetes
- b) Dyslipidemia
- c) Male gender
- d) Prior stroke
- e) Both b) & c)

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Stroke in Afib Risk Assessment

- CHADS2
 - **C**ongestive heart failure = 1 point
 - **H**ypertension = 1 point
 - **A**ge >75yo = 1 point
 - **D**iabetes = 1 point
 - **S**troke/TIA (prior) = 2 points

 - Max = 6 points

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Stroke in Afib Risk Assessment

- CHADS2
 - 0 point = 0.8% annual stroke risk
 - 1-2 points = 2.7% annual stroke risk
 - 3-6 points = 5.3% up to 18.2% annual stroke risk

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Stroke in Afib Risk Assessment

- CHA2DS2-VASc
 - **C**ongestive heart failure = 1 point
 - **H**ypertension = 1 point
 - **A**ge 65-74yo = 1 point; >75yo = 2 points
 - **D**iabetes = 1 point
 - **S**troke/TIA/VTE = 2 points
 - **V**ascular disease = 1 point
 - **S**ex category: Female = 1 point

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Stroke in Afib Risk Assessment

- CHA2DS2-VASc
 - 0 point = 0% annual stroke rate consider ASA QD
 - 1 point = 1.3% consider OAC vs ASA vs DAPT
 - 2 points = 2.2% recommend OAC or DAPT
 - 3 points = 3.2% recommend OAC or DAPT
 - 4 points = 4% recommend OAC or DAPT
 - 5-9 points = 6.7%-15.2% recommend OAC or DAPT

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Bleeding Risk from OAC in Afib

- HAS-BLED

- Hypertension = 1 point
- Abnormal renal & liver functions = 1 point each
- Stroke = 1 point
- Bleeding = 1 point
- Labile INR = 1 point
- Elderly >65yo = 1 point
- Drugs or alcohol = 1 point each

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Bleeding Risk from OAC in Afib

- HAS-BLED

- <3 points = <2 bleeds/100 patients per year
- 3 points = 3.74
- 4 points = 8.7
- 5 points = 12.5

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Bleeding Risk from OAC in Afib

- ATRIA
 - **Anticoagulation & Risk Factors in Atrial Fibrillation**
 - Anemia = 3 points
 - Severe renal disease/dialysis = 3 points
 - Age ≥ 75 = 2 points
 - Prior hemorrhage = 1 point
 - Hypertension = 1 point

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Bleeding Risk from OAC in Afib

- ATRIA
 - < 4 points = low risk
 - 4 points = intermediate risk
 - > 4 points = high risk

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Bleeding Risk from OAC in Afib

- HEMORR2HAGES

- **H**epatic or renal disease
- **E**thanol abuse
- **M**alignancy
- **O**lder age >75yo
- **R**educed platelet count or function
- **R**e-bleeding
- **H**ypertension
- **A**nemia
 - M<13g/dL & F<12g/dL
- **G**enetic factors
 - CYP2C9 SNP
- **E**xcessive fall risk
- **S**troke

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Bleeding Risk from OAC in Afib

- HEMORR2HAGES

- 1 point for each risk factor
- 0 points = 1.99% risk per 100 patient-years of warfarin
- 1 point = 2.5%
- 2 points = 5.3%
- 3 points = 8.4%
- 4 points = 10.4%
- 5+ points = 12.3%

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Decision Making Tools

- CHA2DS2-VASc / HAS-BLED / EHRA
 - www.chadsvasc.org
 - Includes European Heart Rhythm Association score
 - EHRA I no symptoms
 - EHRA II mild symptoms, normal daily activity not affected
 - EHRA III severe symptoms, normal daily activity affected
 - EHRA IV disabling symptoms, normal daily activity discont'd
 - Allows copy & paste of score into your EHR

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Decision Making Tools

- **Stroke *P*revention in *A*trial Fibrillation *R*isk Calculator**
 - www.sparctool.com
 - Available in mobile version, too (but not a true app)
 - Uses CHA2DS2-VaSc & HAS-BLED
 - Compares outcomes using antiplt vs VKA vs DOACs
- **Society for Vascular Medicine**
 - www.mybloodclots.org
 - Appears to use CHA2DS2-VaSc & HAS-BLED

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AES Question #3

Initiate warfarin therapy with following doses

- a) 1mg
- b) 2mg
- c) 5mg
- d) 10mg
- e) Both c) or d)

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How to Initiate Warfarin

- Protect against further/immediate disease progression w/simultaneous parenteral anticoagulation
 - Your choice: UFH vs LMWH
- Start w/either 5mg or 10mg QD x 2d
 - ACCP recommends latter
- Follow appropriate protocol based upon INR
- Continue parenteral anticoagulation until INR 2-3 for 2d

Chest. 2012; 141(2)(Suppl):7S-47S

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How to Initiate Warfarin

Day	INR	Dose (mg)	Day	INR	Dose (mg)
1	-	5	5	<2	10
2	-	5		2.0-3.0	5
3	<1.5	10		>3	0
	1.5-1.9	5	6	<1.5	12.5
	2.0-3.0	2.5		1.5-1.9	10
	>3	0		2.0-3.0	7.5
4	<1.5	10		>3	0
	1.5-1.9	7.5			
	>3	0			

Am Fam Physician. 2005 Feb 15;71(4):763-765

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How to Initiate Warfarin

Day	INR	Dose (mg)	Day	INR	Dose (mg)
1	-	10			
2	-	10			
3	<1.3	15	4	-	15
	1.3-1.4	10		-	10
	1.5-1.6	10		-	5
	1.7-1.9	5		-	5
	2.0-2.2	2.5		-	2.5
	2.3-3	0		-	2.5
	>3	0		-	0

Am Fam Physician. 2005 Feb 15;71(4):763-765

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How to Initiate Warfarin

Day	INR	Day	INR	Dose (mg)	Day	Dose (mg)	Day	Dose (mg)
3		5			6		7	
	≤1.4		<2	15		15		15
			2.0-3.0	7.5		5		7.5
			3.1-3.5	0		5		5
			>3.5	0		0		2.5
	1.5-1.9							
			<2	7.5		7.5		7.5
			2.0-3.0	5		5		5
			3.1-3.5	2.5		2.5		2.5
			>3.5	0		2.5		2.5

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How to Initiate Warfarin

Day	INR	Day	INR	Dose (mg)	Day	Dose (mg)	Day	Dose (mg)
3		5			6		7	
	2.0-3.0		<2	5		5		5
			2.0-3.0	2.5		5		2.5
			3.1-3.5	0		2.5		0
			>3.5	0		0		2.5
	>3.0							
			<2	2.5		2.5		2.5
			2.0-3.0	2.5		0		2.5
			3.1-4.0	0		2.5		0
			>4	0		0		2.5

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How to Adjust & Manage Warfarin

- Make life as easy as possible for your patient
 - Make warfarin regimen as uncomplicated as possible
- Think of warfarin regimen in total weekly dose
 - Adjust total weekly dose up/down by 5-20%
 - Send home w/reminders
 - <https://www.aafp.org/fpm/2005/0500/fpm20050500p77-rt2.pdf> based upon 5mg tablet w/total weekly dose adj by 2.5mg increments

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How to Adjust & Manage Warfarin

- Keep a list of patients on warfarin
 - <https://www.aafp.org/fpm/2005/0500/fpm20050500p77-rt1.pdf>
- Set reminders to check patient's INR q4wks
 - Electronically
 - Or manually using above list
- Assign above duties to staff to contact patients to arrange for testing & obtain results

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AES Question #4

Your 65yo F w/atrial fibrillation on stable warfarin dosing regimen presents w/INR 3.5 w/o evidence of any bleeding complication. You should

- a) Hold warfarin x 1 dose then lower wkly dose by 10%
- b) Hold warfarin x 2 doses then lower wkly dose by 10%
- c) Ask about the 4 D's: diet, drugs, dose & disease
- d) Make no change to dosing regimen & recheck in 1-2wks
- e) Both c) & d)

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How to Adjust & Manage Warfarin

- After any unexpected abrupt or major change in INR >0.5 outside goal range, ask about the 4 D's
 - Diet: any major change in vitamin K consumption?
 - Drugs: any new or discontinued meds since last INR?
 - Dose: any missed doses?
 - Disease: any recent illness? Fever? N/V/D?

<http://bit.ly/UCSDwarfarin4Ds>

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How to Adjust & Manage Warfarin

- If previously stable therapeutic INR w/minor change in INR ≤ 0.5 outside goal range and no changes to $\bar{4}$ D's, just recheck INR in 1-2wk before adjusting dose
 - Grade 2C
- If consistently stable therapeutic INR, may decr testing from q4wk down to q12wk
 - Grade 2B

Chest. 2012; 141(2)(Suppl):7S-47S

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How to Adjust & Manage Warfarin

- If motivated & can demonstrate competency in self-management strategies, incl self-testing equipment,
 - Suggest patient self-management rather than usual outpt INR monitoring
 - Grade 2B

Chest. 2012; 141(2)(Suppl):7S-47S

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Self-monitoring vs Self-management

- In patients taking warfarin (Coumadin) for anticoagulation, there is moderate-quality evidence that both self-monitoring (number needed to treat [NNT] = 100) and self-management (NNT = 53) reduce thromboembolic events, and that self-management reduces all-cause mortality (NNT = 67)

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Self-monitoring vs Self-management

- There is low- to moderate-quality evidence that neither self-management nor self-monitoring reduces major or minor hemorrhage
- Physicians should consider self-management or self-monitoring for patients who are willing and able to use these strategies
 - *Am Fam Physician*. 2017 Jun 1;95(11):700-701

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Self-monitoring vs Self-management

Outcome	Self-monitoring	Self-managed
Thromboembolism	Improved	Improved
All-cause mortality	No different	Improved
Major hemorrhage	No different	No different
Minor hemorrhage	No different	No different

Am Fam Physician. 2017 Jun 1;95(11):700-701

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Oops!...I did it again

- Elevated INR w/o significant bleeding
 - INR <4.5
 - Reduce or skip warfarin dose
 - Monitor INR
 - Resume warfarin when INR therapeutic

Prescriber's Letter. May 2012

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Oops!...I did it again

- Elevated INR w/o significant bleeding
 - INR 4.5-10
 - Hold 1-2 doses of warfarin
 - Monitor INR
 - Resume warfarin at lower dose when INR therapeutic
 - Vitamin K
 - Not routinely recommended if no evidence of bleeding
 - 1-2.5mg PO if bleeding risk is high
 - 5mg PO if urgent surgery needed

Prescriber's Letter. May 2012

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Oops!...I did it again

- Elevated INR w/o significant bleeding
 - INR >10
 - Hold warfarin
 - Monitor INR
 - Resume warfarin at lower dose when INR therapeutic
 - Give vitamin K 2.5-5mg PO even if not bleeding
 - May give IV formulation orally, mixed w/OJ to improve taste

Prescriber's Letter. May 2012

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Oops!...I did it again

- Elevated INR w/significant bleeding
 - Hold warfarin
 - Monitor INR
 - Give vitamin K 5-10mg by slow IV infusion
 - Some sources allow for PO route
<http://bit.ly/OSUMCelevINR>
 - Most sources agree: **avoid IM/SC** b/c erratic absorption
 - Recommend prothrombin complex concentrate (PCC) over fresh frozen plasma (FFP)

Prescriber's Letter. May 2012

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AES Question #5

To bridge or not to bridge prior to invasive procedures in patients w/Afib who receive VKA

- a) Yes, w/LMWH
- b) Yes, w/UFH
- c) Yes, w/DOAC/NOAC
- d) Yes, w/ASA +/- another antiplt agent
- e) No

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Bridging

- Bridging anticoagulation worsens outcomes for patients with atrial fibrillation who undergo an elective invasive procedure, resulting in more episodes of major bleeding and no difference in the rate of stroke or venous thromboembolism
 - *Am Fam Physician*. 2016 Jan 15;93(2):130

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What about pain killers, etc?

- Avoid concomitant NSAIDs and/or Cox 2 inhibitor in patients on VKAs
 - And by extension, DOACs
- Avoid concomitant antiplatelet agents unless benefit is known or highly likely to be greater than harm from bleeding
 - Acute coronary syndrome
 - Recent coronary stent
 - Recent bypass surgery

Chest. 2012; 141(2)(Suppl):7S-47S

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Consider new agents in patients, with atrial fibrillation and at least one other risk factor for stroke, that do not require frequent laboratory monitoring are as effective as warfarin for prevention of stroke or systemic embolism and have comparable risks of major bleeding

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AES Question #6

Which DOAC/NOAC requires parenteral anticoagulation before initiation

- a) Apixaban
- b) Dabigatran
- c) Edoxaban
- d) Rivaroxaban
- e) Both b) & c)

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Too many DOACs, too little time!

- If incr'd risk of thromboembolism w/acceptable bleeding risk,
 - Prefer Dabigatran 150mg BID
 - Only agent to have superior efficacy in reduction of ischemic stroke
 - Apixaban shows reduction in hemorrhagic stroke in composite outcome
 - Edoxaban 30mg is only DOAC w/higher ischemic stroke c/w warfarin

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- If incr'd risk of bleeding,
 - Prefer Apixaban
 - Consistent reduction in bleeding outcomes regardless of indication
 - Edoxaban would be reasonable alternative

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- If recurrent h/o gastrointestinal hemorrhage,
 - Edoxaban 30mg associated w/lower rate of GIB c/w warfarin
 - Dabigatran 150mg, Rivaroxaban & Edoxaban 60mg associated w/higher rate of GIB c/w warfarin
 - Dabigatran 110mg & Apixaban associated w/similar rate of GIB c/w warfarin

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- If significant dyspepsia, PUD, post-vagotomy, gastric drainage procedure, antrectomy, (sub)total gastrectomy, or post-bariatric procedure,
 - Avoid Dabigatran
 - May incr peptic ulcer symptoms
 - Limited GI absorption (6-8%) such that minor fluctuations may impact plasma level profoundly

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- If recurrent h/o gastrointestinal hemorrhage,
 - Dabigatran has similar proportion of UGIB vs LGIB
 - Rivaroxaban & Apixaban associated w/2:1 UGIB vs LGIB
 - Recommend any Factor Xa inhibitor over Dabigatran if h/o LGIB
 - ***Consider alternative anticoagulant for several weeks after polypectomy***

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- If CKD requiring dialysis,
 - Warfarin remains 1st choice
 - Apixaban is FDA approved for CKD w/o dose adjustment
- If compliance/adherence is problematic,
 - Prefer Rivaroxaban or Edoxaban
- If >75yo,
 - Prefer Factor Xa inhibitor over Dabigatran 150mg b/c unfavorable risk:benefit in elderly

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- If significant CAD,
 - Avoid Dabigatran
- If stable warfarin regimen,
 - No need to contemplate change to DOAC

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

Clinical Situation	1 st Choice	2 nd Choice	Avoid
High thromboembolic & low bleeding risk	Dabigatran 150mg	Apixaban Edoxaban 60mg Rivaroxaban Dabigatran 110mg	Edoxaban 30mg
Low thromboembolic & high bleeding risk	Apixaban Edoxaban 30mg	Edoxaban 60mg Dabigatran 110mg	Dabigatran 150mg Rivaroxaban
Moderate thromboembolic & bleeding risk	Apixaban Edoxaban 60mg Dabigatran 110mg	Rivaroxaban Dabigatran 150mg	Edoxaban 30mg

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

Clinical Situation	1 st Choice	2 nd Choice	Avoid
High thromboembolic & bleeding risk	Apixaban	Rivaroxaban Edoxaban 60mg Dabigatran 150mg	Edoxaban 30mg
Compliance concerns	Edoxaban 60mg Rivaroxaban	Edoxaban 30mg	Dabigatran Apixaban
Moderate renal dysfunction (CrCl 30-44mL/min)	Apixaban	Rivaroxaban Dabigatran 110mg Edoxaban 30/60mg	Dabigatran 150mg
Dialysis	Warfarin		No DOACs are FDA approved

Ann Hematol. 2016; 95: 437–449

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Too many DOACs, too little time!

- “In general, DOACs have similar efficacy, with better safety, compared to Warfarin for NVAf”

Ann Hematol. 2016; 95: 437–449

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Establish or revise existing practice-level protocols for anticoagulation management, based upon current evidence-based recommendations and guidelines, including having clearly defined staff roles and responsibilities

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Practice-Level Protocols

- Patients taking warfarin (Coumadin) should be treated using systematic processes of care to optimize effectiveness and minimize adverse effects

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Practice-Level Protocols

- Compared with usual clinic-based care, patient self-testing for international normalized ratios, with or without self-dosing of warfarin, is associated with significantly fewer deaths and thromboembolic complications without any increase in bleeding complications for a select group of motivated patients who have completed appropriate training

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Practice-Level Protocols

- In patients with atrial fibrillation and at least one other risk factor for stroke, new agents (rivaroxaban [Xarelto] and dabigatran [Pradaxa]) that do not require frequent laboratory monitoring are as effective as warfarin for prevention of stroke or systemic embolism and have comparable risks of major bleeding

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Practice-Level Protocols

- Rhythm control of atrial fibrillation through electrical or pharmacologic cardioversion requires anticoagulation therapy three weeks before and four weeks after cardioversion

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Practice-Level Protocols

- Patients with nonvalvular atrial fibrillation who are at low risk of stroke can be treated with 81 to 325mg of aspirin per day
- Warfarin (Coumadin & Jantoven) is more effective than aspirin in preventing thromboembolic events in patients with atrial fibrillation, although it confers a higher risk of bleeding

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Practice-Level Protocols

- Clinical factors, such as whether the deep venous thrombosis was confined to distal or proximal vein, whether the thrombotic episode was an initial or recurrent event, or whether transient risk factors were present, should determine duration of anticoagulant therapy in patients with VTE

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Practice-Level Protocols

- Patients with a VTE and cancer should be treated with low-molecular-weight heparin for at least the first three to six months of long-term anticoagulation therapy
- Subsequent treatment with low-molecular-weight heparin or vitamin K antagonist should be continued for as long as the cancer is active

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Practice-Level Protocols

- Warfarin is superior to aspirin plus clopidogrel (Plavix) and confers the same risk of bleeding in patients with atrial fibrillation
- Adding full-dose aspirin to warfarin should be avoided because of the increased risk of bleeding

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Practice-Level Protocols

- Clopidogrel (Plavix), prasugrel (Effient), and ticagrelor (Brilinta) are recommended in combination with aspirin for a minimum of 12 months in patients receiving drug-eluting stents, and for up to 12 months in patients receiving bare metal stents

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Practice-Level Protocols

- Clopidogrel and ticagrelor are recommended for conservative medical management of MI in combination with aspirin (162 to 325mg per day) for up to 12 months
- Aspirin (162 to 325mg per day) should be given to all patients with suspected acute MI and continued indefinitely at a dosage of 75 to 162mg per day upon discharge

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Practice Recommendations

- Atrial fibrillation
 - I48.0 paroxysmal
 - I48.1 persistent
 - I48.2 chronic
 - I48.91 unspecified
 - <https://www.icd10data.com/ICD10CM/Codes/I00-I99/I30-I52/I48->

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Practice Recommendations

- Long term (current) use of anticoagulants
 - Z79.01
 - <https://www.icd10data.com/ICD10CM/Codes/Z00-Z99/Z77-Z99/Z79-/Z79.01>
- Abnormal coagulation profile
 - R79.1
 - <https://www.icd10data.com/ICD10CM/Codes/R00-R99/R70-R79/R79-/R79.1>

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Practice Recommendations

- G0248 (since 2008)
 - Demonstration, prior to initiation of home INR monitoring, for patient with either mechanical heart valve(s), chronic atrial fibrillation, or venous thromboembolism who meets Medicare coverage criteria, under the direction of a physician

<http://bit.ly/OldHCPCS4INRtesting>

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Practice Recommendations

- G0248 (since 2008)
 - Includes: face-to-face demonstration of use and care of the INR monitor, obtaining at least one blood sample, provision of instructions for reporting home INR test results, and documentation of patient's ability to perform testing and report results

<http://bit.ly/OldHCPCS4INRtesting>

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Practice Recommendations

- G0249 (since 2008)
 - Provision of test materials and equipment for home INR monitoring of patient with either mechanical heart valve(s), chronic atrial fibrillation, or venous thromboembolism who meets Medicare coverage criteria; includes: provision of materials for use in the home and reporting of test results to physician; testing not occurring more frequently than once a week; testing materials, billing units of service include 4 tests

<http://bit.ly/OldHCPCS4INRtesting>

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Practice Recommendations

- G0250 (since 2008)
 - Physician review, interpretation, and patient management of home INR testing for patient with either mechanical heart valve(s), chronic atrial fibrillation, or venous thromboembolism who meets Medicare coverage criteria; testing not occurring more frequently than once a week; billing units of service include 4 tests

<http://bit.ly/OldHCPCS4INRtesting>

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Practice Recommendations

- CPT 93792 (new for 2018)
 - Patient/caregiver training for initiation of home international normalized ratio (INR) monitoring under the direction of a physician or other qualified health care professional, face-to-face, including use and care of the INR monitor, obtaining blood sample, instructions for reporting home INR test results, and documentation of patient's/caregiver's ability to perform testing and report results

<http://bit.ly/NewCPT4INRtesting>

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Practice Recommendations

- CPT 93793 (new for 2018)
 - Anticoagulant management for a patient taking warfarin, must include review and interpretation of a new home, office, or lab international normalized ratio (INR) test result, patient instructions, dosage adjustment (as needed), and scheduling of additional test(s), when performed

<http://bit.ly/NewCPT4INRtesting>

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References

- Evidence-Based Initiation of Warfarin
 - *Am Fam Physician*. 2005 Feb 15; 71(4):763-765
- A Systematic Approach to Managing Warfarin Doses
 - *Fam Pract Manag*. 2005 May; 12(5):77-83
- How to choose appropriate direct oral anticoagulant for patient with nonvalvular atrial fibrillation
 - *Ann Hematol*. 2016; 95: 437–449

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References

- ACCP Antithrombotic Therapy & Prevention of Thrombosis (9th ed)
 - *CHEST*. 2012; 141(2)(Suppl):7S-47S
- Antithrombotic Therapy for VTE Disease
 - *CHEST*. 2016; 149(2):315-352

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References

- Michigan Anticoagulation Quality Improvement Initiative (MAQI2) Anticoagulation Toolkit
 - <http://bit.ly/MAQI2AnticoagToolkit>
 - <http://bit.ly/MAQI2AnticoagToolkitAppleStore>
 - <http://bit.ly/MAQI2AnticoagToolkitGooglePlay>

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Calculators

- MDCalc
 - <https://www.mdcalc.com/>
 - <http://bit.ly/MDCalcAppleStore>
 - <http://bit.ly/MDCalcGooglePlay>
- SPARC Tool
 - <http://sparctool.com/>
 - <http://www.sparctool.com/mobile>

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Calculators

- ACC AnticoagEvaluator (Apple Store)
 - <http://bit.ly/ACCAnticoagEvaluator>
- ACC ManageAnticoag (Google Play)
 - <http://bit.ly/ACCManageAnticoag>

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Questions



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