


Piecing together the new CHEST guidelines



Highlights of CHEST 2012
Erika Hellenbart, PharmD, BCPS
September 15, 2012

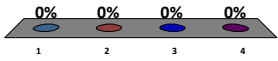
The speakers have nothing to disclose.

Highlights of CHEST 2012

- Downgraded strength of recommendations
- Novel oral anticoagulants
- Aspirin for everyone
- Mechanical valve replacement and additional risk factors
- Extended interval monitoring
- Duration of anticoagulation therapy
- Orthopedic prophylaxis
- Perioperative bridging

To what extent have you adopted the CHEST 2012 guidelines?

1. All
2. Most
3. A few
4. None



Category	Percentage
1	0%
2	0%
3	0%
4	0%

Defining recommendation grades

Grade ¹	Benefit vs. Risk	Strength of Supporting Evidence	Implications
1A	Benefit clearly outweighs risk	RCTs - consistent evidence - without important limitations Observational studies - Exceptionally strong	Application to most patients in most circumstances
2A	Benefits closely balanced with risks	RCTs - consistent evidence - without important limitations Observational studies - Exceptionally strong	Best action may differ depending on circumstances
2B	Benefits closely balanced with risks	Limitations with RCTs Higher quality research may be required	Best action may differ depending on circumstances

1. Guyatt GH, Akl EA, Crowther M, et al. Introduction to the ninth edition: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2012; 141(2)(suppl): 48S-52S.

Decrease in 1A recommendations

- Thrombosis experts excluded from final recommendations¹
 - Involved in discussions and review of evidence
 - Unconflicted methodologists took responsibility for each chapter
 - Not necessarily thrombosis experts
 - Minimized financial and intellectual conflict of interest

1. Guyatt GH, Akl EA, Crowther M, et al. Introduction to the ninth edition: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2012; 141(2)(suppl): 48S-52S.

Decrease in 1A recommendations

- New approach to determining strength of recommendation¹
 - 1A if treatment benefits all aspects of care
 - Surrogate vs. patient-important endpoints
 - Patient values and preferences considered²
 - Accessibility
 - Financial impact

1. Guyatt GH, Akl EA, Crowther M, et al. Introduction to the ninth edition: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2012; 141(2)(suppl): 48S-52S.
2. MacLean S, Mulla S, Akl EA, et al. Patient values and preferences in decision making for antithrombotic therapy: a systematic review: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest. 2012; 141(2)(suppl): e15-e23S.

Initiating therapy

CHEST 2012 2.1.8- 2.1.10

CHADS ₂	Medication Recommendation
Low Risk = 0	No therapy (2B)
Intermediate Risk = 1	Oral anticoagulation (1B)
High Risk = 2 or greater	Oral anticoagulation (1A)

Initiating therapy

CHEST 2008 1.1.2-1.1.4	CHEST 2012 2.1.8-2.1.10
Low risk Long term aspirin therapy (1B)	CHADS ₂ =0 No medication therapy (2B)
Intermediate risk Warfarin (1A) or aspirin (1B) therapy	CHADS ₂ =1 Oral anticoagulation therapy (1B)
High risk Long term warfarin therapy (1A)	CHADS ₂ =2 or greater Oral anticoagulation therapy (1A)

The 2012 CHEST guidelines suggest which of the following medications for MJ?

- Warfarin 5 mg daily
- Aspirin 75 mg daily
- Dabigatran 150 mg twice a day
- Clopidogrel 75 mg daily

Therapy recommendations

- CHEST 2012 2.1.11
 - Recommends the use of dabigatran 150mg twice a day as first line oral anticoagulant therapy rather than dose adjusted VKA therapy. (2B)

Therapy recommendations

CHEST 2008 1.1.2-1.1.4	CHEST 2012 2.1.8-2.1.11
Low risk Long term aspirin therapy (1B)	CHADS ₂ =0 No medication therapy (2B)
Intermediate risk Warfarin (1A) or aspirin (1B) therapy	CHADS ₂ =1 Dabigatran 150mg twice a day (2B)
High risk Long term warfarin therapy (1A)	CHADS ₂ =2 or greater Dabigatran 150mg twice a day (2B)

Following patients are listed as exceptions to the above recommendation and adjusted dose VKA is recommended:

- AF and mitral stenosis
- AF and stable coronary artery disease
- AF and placement of an intracoronary stent
- AF and ACS with no intracoronary stent placement

MJ requests that she be started on warfarin due to the cost of dabigatran. Her physician agrees and sends her to your clinic. The 2012 CHEST guidelines would suggest which of the following doses?

- Warfarin 2.5 mg for two days
- Warfarin 5 mg for two days
- Warfarin 7.5 mg for two days
- Warfarin 10 mg for two days

Warfarin dosing

CHEST 2008 2.1.1, 2.2.1	CHEST 2012 2.1
Initial dose of 5-10 mg for 1-2 days (1B)	Initial dose of 10 mg for 2 days (2C)
Initial dose < 5 mg for (1C): Debilitated Recent surgery Elderly Malnourished CHF Liver disease Taking medications that may increase sensitivity to warfarin	No additional dosing recommendations made

Piecing together the new CHEST guidelines

Atrial Fibrillation (AF) Part 2



Brooke Griffin, PharmD

Puzzle # 1: SB

SB is a 92yo African American female with PMH of AF (diagnosed 2004), HTN, OA, PUD (ulcer 1960), CKD (CrCl~20ml/min) and history of breast cancer.

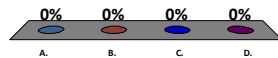
Current medications: warfarin 5mg (7.5mg Sun and 5mg rest of week) aspirin 81mg daily, furosemide 40 daily, esomeprozole 40mg daily, docusate 100mg daily prn, diltiazem 180 daily, calcium carbonate 500mg daily, vitamin D 1000units daily, metoprolol 50mg twice daily, anastrozole 40mg daily

Recent INR values (goal INR 2-3)

Date	INR	Recommendation
8/27	2.4	Continue present management (CPM) (7.5mg Sun and 5mg rest of week)
7/30	2.2	CPM
7/2	2.4	CPM
6/5	2.2	CPM
5/28	2.1	CPM
5/7	2.7	CPM
4/16	1.9	CPM
4/2	2.3	CPM

A pharmacy student asks you if this patient is a candidate for "extended duration" follow-up, per the new CHEST guidelines.
Your response:

- A. No, because of her age
- B. No, because she had one out of range INR in the last 6 months
- C. No, because she is noncompliant with visits
- D. Yes, she is a candidate



What is "Extended Duration?"

CHEST 2012 (3.1)¹

- "For patients taking VKA therapy with consistently stable INRs, we suggest an INR testing frequency of up to 12 weeks rather than every 4 weeks" (2B)

CHEST 2008 (2.3.2)²

- "For patients taking a stable dose of oral anticoagulants, we suggest monitoring at an interval of no longer than every 4 weeks" (2C)

1. Holbrook A, Schulman S, Witt DM, et al. Evidence-based management of anticoagulant therapy: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012; 142(suppl 6):e122-e184B
2. Ansell J, Hirsch J, Hylek E, Jacobson A, Crowther M, Palani G. Pharmacology and management of the vitamin K antagonists. CHEST June 2008;133(6):suppl:105S-136S. doi: 10.1378/chest.08-0970

What is “Consistently Stable?”

One reference in CHEST 2012¹

- One year, single center study² (n=250, age ~70, mostly men, mostly AF)
 - Patients were on the same dose x 6 months
 - Patients were interviewed every 4 weeks
 - Results: 12 week follow-up is safe and noninferior to 4 week follow-up
 - No clinical outcomes

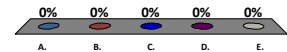
Considerations

- Grade 2B recommendation
- May be useful in well educated, stable, compliant, young patients

1. Holbrook A, Schulman S, Witt DM, et al. Evidence-based management of anticoagulant therapy: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012; 143(suppl 4):e1020-e1045.
2. Schulman S, Pagola S, Bassett C, et al. Warfarin Dose Assessment Every 4 Weeks Versus Every 12 Weeks in Patients With Stable International Normalized Ratios. Ann Intern Med 2011; 155: 653-69

SB comes to your anticoagulation clinic today and her INR is 9.4 for an unknown reason. She denies bleeding. Her current dose of warfarin is 7.5mg Sunday and 5mg all other days. What is your recommendation before her return visit?

- Vitamin K 2.5mg PO x 1 dose
- Vitamin K 5mg PO x 1 dose
- Hold 1 dose of warfarin
- Hold 2 doses of warfarin
- Send to ER



Does SB need Vitamin K?

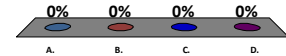
CHEST 2012 (9.1)¹

- “For patients taking VKAs with INRs between 4.5 and 10 with no evidence of bleeding, we suggest against the routine use of vitamin K” (2B)
- “For patients taking VKAs with INRs ≥10.0 and with no evidence of bleeding, we suggest that oral vitamin K be administered” (2C)
 - There was no difference in thromboembolic events or bleeding episodes when vitamin K was administered compared to placebo (pooled analysis).²⁻⁵

1. Holbrook A, Schulman S, Witt DM, et al. Evidence-based management of anticoagulant therapy: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012; 143(suppl 4):e1020-e1045.
2. Crowther MA, et al. Ann Intern Med 2009; 150 (5): 293 - 300
3. Crowther MA, et al. Lancet. 2005; 366(9471): 1551 - 1553
4. Agno W, et al. Thromb Haemostas. 2002; 88 (1):448 - 51
5. Agno W, Garcia D, Silligard M, Gail M, Crowther M, et al. Am Coll Cardiol. 2005; 46 (4): 730 - 742

SB asks you about a new drug she heard about on the news for AF, dabigatran. What is your response?

- Dabigatran is not approved for AF
- CHEST 2012 recommends warfarin over dabigatran for AF
- SB is not a candidate
- SB is a candidate



Can SB switch to dabigatran?

CHEST 2012 (2.1.11)

- “For patients with AF, including those with paroxysmal AF, for recommendations in favor of oral anticoagulation, we suggest dabigatran 150mg twice daily rather than adjusted-dose VKA therapy (target INR range, 2-3)” (2B)

You JJ, Singer DE, Howard PA, et al. Antithrombotic therapy for atrial fibrillation: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012; 143(suppl 4):e315-e375S

Details about dabigatran

CHEST 2012¹

- Dabigatran is favored in patients with AF who are similar to patients in the RE-LY trial²
 - No valvular disease, younger patients, no liver disease, not pregnant, CrCl >30ml/min²
- Dabigatran is the only new FDA-approved VKA therapy alternative for AF

1. You JJ, Singer DE, Howard PA, et al. Antithrombotic therapy for atrial fibrillation: antithrombotic therapy and prevention of thrombosis, 9th ed. American College of Chest Physicians evidence-based clinical practice guidelines. Chest 2012; 143(suppl 4):e315-e375S
2. Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. N Engl J Med. 2009;361:1139-1151


Dabigatran vs. Rivaroxaban for AF?		
	Dabigatran	Rivaroxaban
Main Trial	RE-LY ¹	ROCKET-AF ²
Patients in Trial	•N=18,000; mean age 71; male 65% •CHADS-2 score ≥3 (33%)	•N=14,000; median age 73; male 60% •CHADS-2 score ≥3 (87%)
Efficacy Compared to Warfarin	•110mg twice daily: Non-inferior (not approved) •150mg twice daily: Superior	20mg once daily: Non-inferior
Renal Dosing	CrCl 15-30ml/min: 75mg twice daily, however, pts with CrCl<30ml/min were excluded from RE-LY ¹	CrCl 15-50ml/min: 15mg daily
Safety Compared to Warfarin	•Increased rate of GI bleed •Trend towards increased rate of major bleeding in patients ≥75	•Increased rate of GI bleed •Increased rate of transfusions
References	1. Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. <i>N Engl J Med</i> . 2009;361:1139-51.	2. Patel M, Mahaffey K, Garg J, et al. Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. <i>N Engl J Med</i> 2011; 365:883-91

	Dabigatran	Rivaroxaban
Drug Interactions	•Avoid with rifampin •Reduce dabigatran dose with dronedarone and ketoconazole in patients with CrCl 30-50ml/min	•Avoid with strong CYP3A4 inhibitors •Bleeding risk may be increased with ASA/NSAIDs/Clopidogrel
Clinical Pearls	•Caution regarding bleeding risk in older patients •Twice daily administration	•Patients in trial had higher stroke risk ² •Black Box Warning: Do not discontinue rivaroxaban without another anticoagulant on board and hematomas in patients on rivaroxaban receiving spinal procedures
Issues for Both Drugs	Cost No antidote No monitoring (+/-) No head-to-head comparison trial data	
References	1. Connolly SJ, Ezekowitz MD, Yusuf S, et al. Dabigatran versus warfarin in patients with atrial fibrillation. <i>N Engl J Med</i> . 2010;361:1139-51.	2. Patel M, Mahaffey K, Garg J, et al. Rivaroxaban versus warfarin in nonvalvular atrial fibrillation. <i>N Engl J Med</i> 2011; 365:883-91

Piecing together the new CHEST guidelines: Venous Thromboembolism Updates

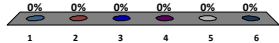
Brian Cryder, PharmD, BCACP, CACP

1. Falck-Ytter Y, Francis CW, Johanson NA, et al. Prevention of VTE in orthopedic surgery patients. *CHEST* 2012; 141: 278s-325s.
2. Kearon C, Akl EA, Comerota AJ, et al. Antithrombotic therapy for VTE disease. *CHEST* 2012; 141: 419s-494s.



Puzzle # 1: Which thromboprophylaxis would you choose for a total knee replacement ?

1. Enoxaparin
2. Rivaroxaban
3. Fondaparinux
4. Warfarin
5. Aspirin
6. Other



Options vs Preference

- CHEST 2012 (2.1.1):
 - “In patients undergoing THA or TKA, recommend... for a minimum of 10-14 days rather than no prophylaxis”
 - *LMWH, fondaparinux*, apixaban, dabigatran, rivaroxaban, LDUH, *adjusted dose VKA*, aspirin (1B) or IPCD (1C) * *from 2008*
- CHEST 2012 (2.3.1):
 - “...we suggest the use of LMWH in preference to the other agents we recommended” (2B, except for 2C vs aspirin and adjusted dose VKA)
- Both 2008 and 2012 consistent on duration
 - Up to 35 days preferred over minimum of 10-14 days

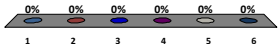
American Academy of Orthopedic Surgeons: 2011 guidelines

- “Current evidence is unclear about which prophylactic strategy (or strategies) is/are optimal or suboptimal. Therefore, we are unable to recommend for or against specific prophylactics in these patients.” (Grade of Recommendation: Inconclusive)
- “In the absence of reliable evidence about how long to employ these prophylactic strategies, it is the opinion of this work group that patients and physicians discuss the duration of prophylaxis.” (Grade of Recommendation: Consensus)

Preventing venous thromboembolic disease in patients undergoing elective hip and knee arthroplasty: evidence-based guideline. American Academy of Orthopedic Surgeons. http://www.aaos.org/research/guidelines/VTE/VTE_full_guideline.pdf Accessed August 10, 2012.

Puzzle # 2A: patient has just completed 6 months of warfarin therapy after an unprovoked distal deep vein thrombosis. What is your long term anticoagulation recommendation?

1. D/c all anticoagulants
2. Continue warfarin
3. Switch to aspirin
4. Switch to dabigatran
5. Order other diagnostic tests
6. Other



2012 vs 2008: different answers?

- CHEST 2008
 - More generalized recommendations
- CHEST 2012
 - Much more specific for patient subgroups

<ul style="list-style-type: none"> 2.1.1 provoked (transient risk factor) 2.1.2 unprovoked 2.1.3 concurrent malignancy 	<ul style="list-style-type: none"> 3.1.1: provoked proximal (surgery) 3.1.2: provoked proximal (transient risk factor) 3.1.3: any provoked distal 3.1.4(,1-5): unprovoked (various) 3.1.5: concurrent malignancy
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1. Kearon C, Kahn S, Agnelli G, et al. Antithrombotic therapy for venous thromboembolic disease. CHEST 2008; 133: 454S-545S.

Making the case for halting anticoagulants or continuing warfarin

- CHEST 2012 (3.1.4)
 - “In patients with unprovoked DVT of leg (distal or proximal), we recommend... at least 3 months over treatment of shorter duration. After 3 months ...should be evaluated for the risk-benefit ratio of extended therapy” (1B)
- CHEST 2012 (3.4)
 - “In patients with DVT of leg who receive extended therapy, we suggest treatment with the same anticoagulant chosen for the first 3 months” (2C)

Making the case for transition to aspirin

- CHEST 2012: no mention of aspirin as an option in this context
- WARFASA study (2012)
 - RCT of 402 unprovoked VTE patients after 6-18 months of VKA therapy
 - ASA 100mg daily vs placebo
 - ASA decreased DVT rate but no difference in PE

1. Becattini, et al. Aspirin for preventing recurrence of venous thromboembolism. N Engl J Med 2012; 366 (21): 1959-67.

Making the case for transition to dabigatran

- CHEST 2012 (remarks on section 3.3)
 - “Treatment of VTE with dabigatran or rivaroxaban, in addition to being less burdensome...may prove to be associated with better clinical outcomes”
 - Postmarketing studies not available at time of guideline preparation
- RE-MEDY : dabigatran = warfarin in 6-36 month extension but ↑ MI rate with dabigatran
- RE-SONATE: dabigatran > placebo in 6 month extension, no difference in MI rate

• Both studies were presented as abstracts at International Society on Thrombosis and Haemostasis July 2011

Making the case for re-evaluating objective testing

- D-Dimer – systematic review of 1st unprovoked VTE
 - Negative result ~ 3.5% annual recurrence rate
 - Positive result ~ 8.9% annual recurrence rate
- Venous doppler – mixed opinion
 - Prandoni, et al: (+) residual thrombus = ↑ risk
 - PROLONG: (+) residual thrombus = not a risk factor
- Thrombophilia screening
 - No evidence to support benefit of testing routinely
- CHEST guidelines: do not address topic for duration of therapy

Other Key Updates Related to VTE

- **Medical Prophylaxis**
 - Acutely ill hospitalized medical patients at ↑ VTE risk
 - LMWH, UFH, or fondaparinux (grade 1B)
 - Acutely ill hospitalized medical patients at ↓ VTE risk
 - Do not use pharmacologic or mechanical prophylaxis (grade 1B)
- **Suspected VTE**
 - High suspicion – use parenteral anticoagulant
 - Intermediate – use parenteral anticoagulant if results delayed > 4 hours
 - Low suspicion – no anticoagulant recommended (if results within 24 hours)



Piecing together the new CHEST Guidelines

Bridging Recommendations

Kathleen Vest, PharmD, CDE

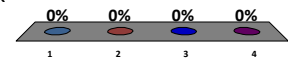
1. Douketis JD, Spyropoulos AC, Spencer FA, et. Al. Perioperative Management of Antithrombotic Therapy: Antithrombotic Therapy and Prevention of Thrombosis. CHEST 2012; 141; e326S-e350S.
2. Douketis JD, Berger PB, Dunn AS. The Perioperative Management of Antithrombotic Therapy: CHEST 2008; 133; 299-339.

Puzzle #1- The random 1.5 INR

- JJ is a 58 year old WF who presents to the anticoagulation clinic for routine INR check. She has been on warfarin since her (mechanical) mitral valve replacement surgery in 2008. Her current warfarin dose is 5 mg daily.
 - No c/o bleeding or bruising. JJ typically eats a spinach salad 3x/week and is typically very consistent with greens. No recent medication changes, OTC meds, or herbals.
 - She missed a dose four days ago.
 - Other medications: lisinopril 10 mg daily, pravastatin 20 mg daily
- **INR today is 1.5**
- This is the lowest INR reported to date. JJ's INR has been very stable in the past year in the 2.5-3.5 range. Four weeks ago, her INR was 3.3.

What would you recommend for this patient?

- A. 10 mg x 1, then CPM. Recheck 5d
- B. 10 mg x 1, then CPM. Start LMWH until INR ≥ 2.5. Recheck 3d
- C. Increase to 7.5 mg Sat/Tue; 5 mg other days. Recheck 10d
- D. CPM. Recheck one week



CHEST 2012 Recommendations

- CHEST 2012 (3.2):
 - “For patients taking VKAs with previously stable therapeutic INRs who present with a single out-of-range INR of 0.5 below or above therapeutic, we suggest continuing the current dose and testing the INR within 1-2 weeks” (2C)
- CHEST 2012 (3.3):
 - “For patients with stable therapeutic INRs presenting with a single subtherapeutic INR value, we suggest against routinely administering bridging with heparin” (2C) .

Puzzle #2: Warfarin therapy interruption

- It is a few months later. You received a phone call today from JJ. She has been “back on track” for awhile, but now is inquiring about her upcoming colonoscopy. It is scheduled for October 1st at 9:00 AM.
 - She had a colonoscopy in 2006 and polyps were removed. The gastroenterologist wants her to hold warfarin prior to procedure.
 - She is wondering what she needs to do.
- Recent labs (done last month): CBC- WNL, CrCl=68 ml/min, current weight= 176 lb.
 - Last INR was 3.1 two weeks ago.

What would you do for JJ?

- A. Hold warfarin 9/26 -9/30. Bridge with enoxaparin 80 mg q12 hrs.
- B. Hold warfarin from 9/26-9/30. Bridge with enoxaparin 80 mg daily.
- C. Hold warfarin from 9/28-9/30. Do not bridge.
- D. Cancel colonoscopy.

What would you do for JJ?

- A. Hold warfarin 9/26-9/30. Bridge with enoxaparin 80 mg q12 hrs.
- B. Hold warfarin from 9/26-9/30. Bridge with enoxaparin 80 mg daily.
- C. Hold warfarin from 9/28-9/30. Do not bridge.
- D. Cancel colonoscopy.

0% 0% 0% 0%

1 2 3 4

Risk Stratification for Determining the Need for Bridge Therapy

Risk Stratum	Mechanical Heart Valve	Atrial Fibrillation	VTE
High	<ul style="list-style-type: none"> •Any mitral valve prosthesis •Any caged-ball or tilting disc aortic valve prosthesis •Recent (within 6 months) stroke or TIA 	<ul style="list-style-type: none"> •CHADS2 score 5 or 6 •Recent (within 3 months) stroke or TIA •Rheumatic valvular heart disease 	<ul style="list-style-type: none"> •Recent (within 3 months) VTE •Severe thrombophilia (Protein C, S, antithrombin def); antiphospholipid antibodies
Medium	<ul style="list-style-type: none"> Bileaflet aortic valve prosthesis and 1 or more of the following RFS: •Afib, prior stroke or TIA, HTN, DM, C/F, age >75 y/o 	<ul style="list-style-type: none"> CHADS2 score of 3 or 4 	<ul style="list-style-type: none"> •VTE within the past 3-12 months •Nonsevere thrombophilia (ex. Heterozygous Factor V leiden, prothrombin gene mutation) •Recurrent VTE •Active cancer (treated within 6 months or palliative)
Low	<ul style="list-style-type: none"> Bileaflet aortic valve prosthesis without Afib and no other risk factors for stroke 	<ul style="list-style-type: none"> CHADS2 score of 0-2 (assuming no prior CVA or TIA) 	<ul style="list-style-type: none"> VTE >12 months previous and no other risk factors

- ### Surgeries/procedures associated with increased bleeding risk
- Urologic surgery and procedures (transurethral prostate resection (TURP), bladder resection, nephrectomy, kidney biopsy)
 - Pacemaker or implantable cardioverter defibrillator device implantation
 - Colonic polyp resection
 - Surgery in vascular organs (ex. kidney, liver, spleen)
 - Bowel resection
 - Major surgery with extensive tissue injury (cancer surgery, joint arthroplasty, reconstructive plastic surgery)
 - Cardiac, intracranial, or spinal surgery

- ### CHEST Guidance
- CHEST 2012 (2.1):
 - “In patients who require temporary interruption of a VKA before surgery, we recommend stopping VKAs approximately 5 days prior to surgery instead of stopping VKAs a shorter time before surgery” (1C)
 - CHEST 2012 (2.4):
 - “In patients with a mechanical heart valve, Afib, or VTE at high risk for thromboembolism, we suggest bridging anticoagulation instead of no bridging during interruption of VKA therapy” (2C)
 - CHEST 2012 (2.2):
 - “In patients who require temporary interruption of a VKA before surgery, we recommend resuming VKAs approximately 12 to 24 h after surgery (evening or next morning) and when there is adequate hemostasis instead of later resumption of VKAs” (2C)

- ### CHEST Guidance
- CHEST 2012 (4.4):
 - “In patients who are receiving bridging anticoagulation with therapeutic-dose SC LMWH and are undergoing non-high bleeding-risk surgery, we suggest resuming therapeutic-dose LMWH approximately 24 h after surgery instead of resuming LMWH more than 24 h after surgery”
 - “In patients who are receiving bridging anticoagulation with therapeutic-dose SC LMWH and are undergoing high bleeding-risk surgery we suggest resuming therapeutic-dose LMWH 48-72 after surgery instead of resuming LMWH within 24 h after surgery” (2C)

Key Pearls with Bridging

- See patients at least one week prior to the scheduled surgery date to plan appropriately
 - Balance risks of VTE vs. perioperative bleeding
 - Communicate with patient and involved providers
 - Factor in other issues such as cost/insurance coverage, ability to inject
- Make sure you have updated labs and weight (CrCl and CBC)

Key Pearls with Bridging

- Provide patients and providers with a calendar
- Patient and caregiver education on injection technique and calendar
- If possible, check INR on the date before surgery
- Assess post-op bleeding to help determine restart of anticoagulant medications
- Close follow up of INR following procedure/surgery

Date	Enoxaparin dose/frequency	Warfarin dose

Remember SB?

- SB is a 92 y/o African American female with PMH of AF (diagnosed 2004), HTN, OA, PUD (ulcer 1960) and history of breast cancer.
- SB will be undergoing a spinal epidural in two weeks and is wondering what to do.
- She tells you that one of her friends had to take some sort of shots when off of warfarin and she is wondering if she needs to do this too?

SB- to bridge or not to bridge?

- Bridge and hold warfarin x 5-7 days prior
- Not bridge and hold warfarin x 5-7 days prior

SB - to bridge or not to bridge?

- A. Bridge and hold warfarin x 5-7 days prior
- B. Do not bridge and hold warfarin x 5-7 days prior



Considerations for SB

- Bleeding risk
 - Age
 - Spinal procedure- risk of bleeding is high
- Thrombosis risk
 - CHADS2 score of 2: HTN and age >75 y/o
- Low risk- do not bridge.
 - Lots of discussion needed in these scenarios between patient, anticoagulation provider, PCP and other physicians involved!

Thank you for participating!

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Piecing together the new CHEST guidelines

Erika Hellenbart, PharmD, BCPS
 Shaunte Pohl, PharmD, BCPS
 Brooke Griffin, PharmD
 Brian Cryder, PharmD, BCACP, CACP
 Kathleen Vest, PharmD, CDE

Post Test Questions

1. Which of the following is false regarding dabigatran?
 - a. It is approved for use in atrial fibrillation
 - b. In the RE-LY trial, dabigatran users experienced a higher rate of GI bleed compared with warfarin users
 - c. Dabigatran is dosed once daily
 - d. There is no antidote for dabigatran

2. GM is a 66yo male who has atrial fibrillation and renal insufficiency (CrCl 25ml/min) He brings a prescription to your pharmacy for rivaroxaban. Which of the following is a true statement?
 - a. GM should not use rivaroxaban because it is contraindicated in patients with CrCl <30ml/min
 - b. GM can use rivaroxaban 20mg daily
 - c. GM can use rivaroxaban 15mg daily
 - d. GM can use rivaroxaban 10mg daily

3. The generic names of the two newly available oral anticoagulants are:
 - a. Warfarin and dabigatran
 - b. Dabigatran and rivaroxaban
 - c. Dabigatran and argatroban
 - d. Rivaroxaban and argatroban

4. The standard dose of dabigatran for the risk reduction of stroke in patients with non-valvular atrial fibrillation is:

- a. 150mg BID
- b. 110mg BID
- c. 50mg BID
- d. 40mg BID

5. Per CHEST 2012, which of the following drug classes is preferred for use in total knee arthroscopy thromboprophylaxis in the absence of contraindications?

- a. Direct thrombin inhibitors (e.g. dabigatran)
- b. Low molecular weight heparin (e.g. enoxaparin)
- c. Vitamin K antagonist (e.g. warfarin)
- d. Factor Xa inhibitor (e.g. rivaroxaban)

6. JP is a 60 year old male patient who has been treated with warfarin for the past 6 months following an unprovoked deep vein thrombosis of the right lower extremity. His primary care physician would like to halt warfarin therapy and initiate aspirin 325mg daily. Does CHEST 2012 support this decision?

- a. Yes - it is included as a 1B recommendation for all unprovoked DVT patients
- b. Yes - it is included as an alternative for patients who are not candidates for transition to dabigatran
- c. No - CHEST 2012 states that aspirin use has no benefit following warfarin treatment for DVT prevention
- d. No - CHEST 2012 does not recommend for or against aspirin use after warfarin, but one clinical study supports this option

7. SG is a 47 year old patient with a mechanical heart valve in the aortic position. This patient does not have any other cardiovascular risk factors. According to CHEST 2012, what is the recommended INR goal?

- a. 1.8-3.2
- b. 2.0-3.0
- c. 2.5-3.5
- d. 3.0-4.0

8. Which of the following patients would be considered high risk for VTE?

- a. 39 year old male with AFib, HTN and diabetes.
- b. 79 year old female with HTN, diabetes, AFib, and a history of TIAs.
- c. 45 year old patient with a history of PE five months ago.
- d. 76 year old male with a history of an aortic valve replacement and diabetes.

9. Which of the following procedures is associated with a high bleeding risk according to CHEST 2012?

- a. Root canal
- b. Transurethral prostate resection (TURP)
- c. Cataract surgery
- d. Dermatologic surgery