

Strategies for Safely Managing Patients on Warfarin
November 4, 2008
Cases and Questions

Pre and Post Questions

1. The risk of an ischemic stroke is generally greater for patients with chronic or paroxysmal AF and a CHADS₂ score >1, who are not managed on warfarin, than the risk of a hemorrhagic stroke in patients with AF placed on warfarin, whose INR is checked monthly and is within the therapeutic range >65% of the time.
 - a. True
 - b. False

2. Point-of-care home INR testing by the patient is now covered by CMS for patients expected to be on warfarin for >6 months who have been properly educated, with which of these clinical indications for long term warfarin:
 - a. Mechanical (prosthetic) heart valve
 - b. AF
 - c. DVT/PE
 - d. TIA/CVA
 - e. a, b, and c
 - f. all of the above

3. Communication with the patient of any INR test result outside the therapeutic range with regard to history taking, possible reasons for abnormal test result, instructions for holding warfarin, dose change and/or repeat testing, and medical record documentation...
 - a. Must be done personally by the responsible attending physician
 - b. Can be done by an office RN, PA or pharmacist under pre-established protocol
 - c. Can be done by a properly trained, non-clinician office staff member using pre-established protocol
 - d. b and c
 - e. All of the above

4. CMS estimates that the % of Medicare beneficiaries who are on warfarin and are managed under Self-Testing or Self-Management is:
 - a. <5%
 - b. 20-30%
 - c. 65-75%

5. CMS estimates that the % of Medicare beneficiaries who are on warfarin and are managed under Usual Care (in the PCP or Cardiologist office setting) is:
 - a. <5%
 - b. 20-30%
 - c. 65-75%

6. CMS estimates that the % of Medicare beneficiaries who are on warfarin and are managed in an Anticoagulation Management & Monitoring Service (AMMS) is:
 - a. <5%
 - b. 20-30%
 - c. 65-75%

Jack Ansell – Case 1

Case 1 – Question 1

A 72 year old man has recently undergone replacement of his mitral valve with a St Jude's mechanical mitral heart valve. He is in normal sinus rhythm (NSR). Which of the following statements regarding his risk of a stroke and the role of warfarin in his management are true?

- Since he is in NSR, he is at standard risk for men of his age
- He is in the "highest risk" category despite his NSR
- If/when placed on warfarin, his targeted INR therapeutic range would be = 2.0-3.0
- If/when placed on warfarin, his targeted INR therapeutic range would be = 2.5-3.5
- b and d

Danny Singer – Case 2

An active 86 year old man presents with new onset AF. He felt his heart beating irregularly for the first time one week ago and the symptom has persisted. Past history includes hypertension for which you treated him with HCTZ, 25 mg daily and later added 50 mg atenolol to achieve adequate BP control. Today, his BP is 130/80 but his pulse is unusually irregular between 80-85/min. The remainder of his CV exam and his neurologic exam are completely normal. EKG shows AF. An echo shows an EF of 50%.

Case 2 - Question 1

Possible treatment options – Is it a reasonable choice to arrange for a cardioversion later today at the hospital without further evaluation and without anticoagulation?

- Yes
- No

Case 2 - Question 2

Possible treatment options – Is it a reasonable choice to start the patient on warfarin, aiming for INR 2-3, and plan on cardioversion in 3-4 weeks?

- Yes
- No

Case 2 - Question 3

Possible treatment options – Is it a reasonable choice to start the patient on warfarin and follow him closely (without plans for cardioversion, since you can see his rate is well controlled and the AF is well tolerated)?

- Yes
- No

Case 2 - Question 4

Possible treatment options – Is it a reasonable choice to perform a transesophageal echocardiogram, and if no clot is found, then proceed to cardioversion today?

- Yes
- No

Case 2 - Question 5

If you chose cardioversion and it proved successful in restoring NSR, his warfarin:

- Can be stopped on the day of the successful cardioversion
- Should be continued for 3-5 days
- Should be continued for 4-6 weeks
- Should be continued permanently

Case 2 - Question 6

On a follow-up visit to your office three months after successful cardioversion, he complains of an irregular heart beat. He is now off warfarin. On exam, he has an irregular pulse at 80/min and EKG confirms he is back in AF. He has no history of falling, is compliant with his prescribed medications and lives with a responsible daughter.

Which of the following options would be reasonable choices?

- a. Cardioversion later the same day; TEE not needed.
- b. Cardioversion after 3-4 weeks back on warfarin
- c. Forgo further cardioversion and discuss with him and his daughter the risks and benefits of long term warfarin and then start him on the maintenance dose that he took peri-cardioversion, assuming his stool is negative for OB.
- d. Tell him not to worry about his heart rhythm since his BP is normal, his HR well controlled and he is tolerating the AF well.
- e. b and c
- f. a and d
- g. All of the above

Case 2 - Question 7

The CHADS₂ score includes which of the following?

- 1) Age >75
- 2) Diabetes
- 3) CAD and/or history of MI
- 4) EF <35%
- 5) HTN

- a. 1, 2, 4 and 5 are correct
- b. Only 1 and 3 are correct
- c. Only 1 and 4 are correct
- d. All are correct

Case 2 - Question 8

The CHADS₂ score can be used to select the best therapy for a patient in chronic and/or paroxysmal AF. What would you do with a score of 0?

- a. ASA
- b. ASA or warfarin
- c. Warfarin
- d. None of the above

Case 2 - Question 9

The CHADS₂ score can be used to select the best therapy for a patient in chronic and/or paroxysmal AF. What would you do with a score of 1?

- a. ASA
- b. ASA or warfarin
- c. Warfarin
- d. None of the above

Case 2 - Question 10

The CHADS₂ score can be used to select the best therapy for a patient in chronic and/or paroxysmal AF. What would you do with a score of 2 or higher, or for any high risk factor?

- a. ASA
- b. ASA or warfarin
- c. Warfarin
- d. None of the above

Sam Goldhaber – Case 3

A 64 year old man in previously good health developed unilateral calf pain and swelling. A LENI confirmed the suspected diagnosis of DVT. How would you manage this patient?

Case 3 - Question 1

Can this patient be managed without a hospital admission?

- a. Yes
- b. No

Case 3 - Question 2

If you elected to manage the patient at home, which of the following steps would you take, in addition to initiating Rx in the office with 1st injection of low molecular weight heparin (LMWH) and assessing the ability of patient and family to administer heparin (LMWH)?

- 1. Before starting warfarin, must send blood for genetic testing
 - 2. On this same first office visit, begin warfarin
 - 3. Stop LMWH as soon as the patient has been on it for 5 days
 - 4. Continue LMWH until the INR has been in the therapeutic range for >48 hours
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- a. 2 and 3 are correct
 - b. 2 and 4 are correct
 - c. 1 and 3 are correct
 - d. 1 and 4 are correct

Case 3 - Question 3

What factors may influence your choice of the initial dose of warfarin?

- a. Age
- b. Weight
- c. The other meds the patient is taking
- d. Expected compliance
- e. Only a, b, and c
- f. All of the above

Case 3 - Question 4

For how long a time should the patient be kept on warfarin?

- a. 3 months
- b. 4-6 months
- c. 6-12 months
- d. For life (truly evidence-based answer is not available)
- e. b and/or d

Case 3 - Question 5

Which of the following would lead you to test for an underlying condition that could influence the duration of your treatment?

- a. A history of at least one previous episode of unprovoked DVT or PE
- b. A family history of DVT or PE
- c. In a female, a history of repeated spontaneous abortions
- d. All of the above

Terry O'Malley – Case 4

Mrs. A is an 82 year old woman with a history of stable CAD and CHF who was admitted to the acute care hospital with a pulmonary embolus. Although in CHF for a number of years, her PCP felt that her EF was not low enough to take on the risks associated with warfarin. She, in fact, never did sustain a systemic arterial embolism but the PE forced reconsideration of the use of warfarin. While in the hospital, she was started on LMWH and warfarin and, on the 4th hospital day, was transferred to a skilled nursing facility (SNF), with the expectation that she would be able to return home where she lived with her daughter after a couple weeks of R&R. Consider the following management issues:

Case 4 - Question 1

She should be kept on LMWH until:

- She has received it for 5 days
- Her INR has been in the therapeutic range (2.0-3.0) for >48 hours
- She leaves the SNF to go home in 2 weeks

Case 4 - Question 2

Upon transfer, the following pieces of clinical information should be communicated to the receiving attending physician at the SNF and to the nursing staff:

- Last 3 INRs
- Dose of warfarin on each of the past 3 days
- An accurate and complete list of discharge meds
- An accurate and complete list of the medications and doses the patient was on when admitted to the Hospital and any changes made in medications and/or doses
- Name and number of the Attending Physician who will be responsible for oversight of the patient's management while in the SNF, including receiving the INR results and making dose adjustments
- All are correct

Case 4 - Question 3

What would be acceptable approach or approaches for the discharging physician to communicate with the receiving attending at the SNF?

- Discharge summary is adequate if sent with the patient at the time of transfer
- Discharge summary which the hospital will get to the SNF within 2-4 days
- Phone call to receiving Attending to supplement the information in the written discharge summary and answer any questions the new Attending may have
- "It's his/her job to call me if they want additional information"
- a and c

Alan Brush – Case 5

A 68 year old female on anticoagulation for atrial fibrillation with target range 2.0-3.0, with last INR of 2.5, has a scheduled dental extraction; the oral surgeon advised the patient to hold anticoagulation for 4 days prior to the procedure to reduce the risk of bleeding. Past medical history includes diabetes and hypertension.

Case 5 - Question 1

Appropriate care around the time of her dental extraction includes:

- Continuing anticoagulation at current dose**, doing dental extraction with therapeutic INR; managing bleeding with local measures such as pressure and 5% aminocaproic acid mouthwash).
- Holding warfarin for 5 days**, with INR goal of below 1.6 the day prior to procedure. Resume warfarin in evening on day of procedure.
- Holding warfarin for 7 days**, with INR goal of below 1.2 the day prior to procedure. Resume warfarin in evening on day of procedure.

Rationale: Low bleeding risk procedures such as simple dental extractions, even if involving multiple teeth, can be managed at a therapeutic level of anticoagulation. Bleeding can be controlled by local measures, such as pressure and aminocaproic acid. Unfortunately, dentists and oral surgeons sometimes request anticoagulation to be held in preparation for these procedures, despite prevailing evidence. The internist should urge the dental clinician to proceed with therapeutic anticoagulation, and should refer him/her to the following website for information: <http://www.warfarinfo.com/dentalprocedures.htm> (table included below). Cataract surgery has a similar low risk, but many ophthalmologists and anesthesiologists will not perform injections into the retrobulbar space due to a proposed increased risk of retrobulbar hemorrhage in anticoagulated patients. Available literature does not support this contention: http://findarticles.com/p/articles/mi_m0689/is_12_52/ai_111614744. However, finding an operating ophthalmologist who will do cataract surgery on patients who are fully anticoagulated can sometimes be a daunting proposition. Otherwise, there is no reason to subject the patient to the increased risk of thromboembolic events, however small, or the increased cost of bridging with LMWH, when a hold of warfarin is needed and clotting risk justifies a bridge.

Alan Brush - Case 6

A 65 year old male on anticoagulation for atrial fibrillation with target range 2.0-3.0, with last INR of 2.5, has a scheduled colonoscopy for colonic polyp surveillance. At his last colonoscopy 3 years ago, 5 adenomatous polyps were removed. Past medical history includes hypertension.

Case 6 - Question 1

Appropriate care around the time of his colonoscopy includes:

- a. **Continuing anticoagulation at current dose**, doing colonoscopy with therapeutic INR.
- b. **Holding warfarin for 5 days**, with INR goal of below 1.6 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

AND

Bridging with low molecular weight heparin (LMWH, such as enoxaprin or fondaparinux), starting 36 hours after first held warfarin dose, up to 24 hours before the procedure; resume LMWH after procedure once cleared by gastroenterologist, until INR therapeutic.

- c. **Holding warfarin for 5 days**, with INR goal of below 1.6 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

BUT

No bridging with LMWH required; risk of thromboembolic complication for a relatively short period off anticoagulation is too low.

- d. **Holding warfarin for 7 days**, with INR goal of below 1.2 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

AND

Bridging with low molecular weight heparin (LMWH, such as enoxaprin or fondaparinux), starting 36 hours after first held warfarin dose, up to 24 hours before the procedure; resume LMWH after procedure once cleared by gastroenterologist, until INR therapeutic.

- e. **Holding warfarin for 7 days**, with INR goal of below 1.2 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

BUT

No bridging with LMWH required; risk of thromboembolic complication for a relatively short period off anticoagulation is too low.

Rationale: Patient is expected to have at least one biopsy (i.e. excision of polyp), so INR must be below therapeutic range, generally accepted as 1.5 or less for colon polyp excisional biopsies. If patient was having a very high risk procedure, such as spinal surgery, goal would be 1.2 or less, and a longer hold would be required. Patient has a low CHADS₂ score of 1, including only hypertension, with a 1.2 year risk of stroke of 3.7%. Assuming subtherapeutic

anticoagulation for up to two weeks, 0.12% of patients with this risk will have a stroke if not anticoagulated during this period. Maintaining anticoagulation during this two-week period prevents less than one stroke in 1000 patients, which is insufficient risk to justify bridging with LMWH. Another consideration for this patient is whether anticoagulation is truly indicated. His CHADS₂ score places him in a group that could reasonably be treated with either aspirin or warfarin by CHEST-8 guidelines, though warfarin, when feasible, is preferred.

Alan Brush - Case 7

A 75 year old male on anticoagulation for atrial fibrillation with target range 2.0-3.0, with last INR of 2.5, has a scheduled colonoscopy for colonic polyp surveillance. At his last colonoscopy 3 years ago, 5 adenomatous polyps were removed. Past medical history includes diabetes, congestive heart failure, hypertension and a cardioembolic stroke within the last year.

Case 7 – Question 1

Appropriate care around the time of his colonoscopy includes:

a. **Continuing anticoagulation at current dose**, doing colonoscopy with therapeutic INR.

b. **Holding warfarin for 5 days**, with INR goal of below 1.6 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

AND

Bridging with low molecular weight heparin (LMWH, such as enoxaprin or fondaparinux), starting 36 hours after first held warfarin dose, up to 24 hours before the procedure; resume LMWH after procedure once cleared by gastroenterologist, until INR therapeutic.

c. **Holding warfarin for 5 days**, with INR goal of below 1.6 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

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No bridging with LMWH required; risk of thromboembolic complication for a relatively short period off anticoagulation is too low.

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e. **Holding warfarin for 7 days**, with INR goal of below 1.2 the day prior to procedure. Resume warfarin in evening on day of procedure, once cleared by gastroenterologist.

BUT

No bridging with LMWH required; risk of thromboembolic complication for a relatively short period off anticoagulation is too low.

Rationale: Patient is expected to have at least one biopsy (i.e. excision of polyp), so INR must be below therapeutic range, generally accepted as 1.5 or less for colon polyp excisional biopsies. If patient was having a very high risk procedure, such as spinal surgery, goal would be 1.2 or less, and a longer hold would be required. Patient has highest possible CHADS₂ score of 6, including all risk factors, with a 1.2 year risk of stroke of 40%. Assuming subtherapeutic anticoagulation for up to two weeks, 1.28% of patients with this risk will have a stroke if not anticoagulated during this period. Actual events occurring during perioperative period for general surgery may actually exceed that percentage. Maintaining anticoagulation during this two-week period prevents at least an estimated 6 strokes in 1000 patients. The longer the duration of expected subtherapeutic values, the greater the benefit of bridging. Thus, a patient having spinal surgery, requiring a longer hold, would have a higher risk if not bridged and therefore more expected benefit from bridging.