

## Assessment Test

### Emerging Treatment Options for the Reversal of Oral Anticoagulant Therapy

This activity is located at [www.ashpadvantage.com/reversal/ondemand](http://www.ashpadvantage.com/reversal/ondemand)

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1. Which of the following was a risk factor for delayed reduction of the international normalized ratio (INR) after discontinuation of warfarin in the retrospective cohort study by Hylek et al. of 633 ambulatory patients with an INR greater than 6.0 and various indications for warfarin therapy?
  - a. Advanced age.
  - b. Low index INR.
  - c. Uncontrolled hypertension.
  - d. Ethanol use.
2. BC is a 75-year-old man with acute decompensated congestive heart failure, prostate cancer, and a new diagnosis of AF in whom stroke prophylaxis with a novel oral anticoagulant is contemplated. Pertinent laboratory results include blood pressure 110/70 mmHg and creatinine clearance 45 mL/min. BC's CHADS<sub>2</sub> score and risk for stroke is
  - a. 3, very high.
  - b. 2, high.
  - c. 1, intermediate.
  - d. 0, low.
3. Which of the following risk factors included in the HAS-BLED scoring system for bleeding risk assessment in patients with AF receiving oral anticoagulant therapy is potentially reversible?
  - a. Chronic kidney disease.
  - b. Uncontrolled hypertension.
  - c. Bleeding history.
  - d. Stroke.
4. LS is a 58-year-old woman receiving rivaroxaban for AF who has a creatinine clearance of 95 mL/min and plans to undergo elective coronary artery bypass graft surgery. How many doses should be withheld to prevent perioperative bleeding?
  - a. None.
  - b. 1 or 2.
  - c. 3 or 4.
  - d. 6-8.



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5. Which of the following coagulation assays is most useful for monitoring rivaroxaban therapy in LM?
  - a. Ecarin clotting time (ECT).
  - b. Thrombin time (TT).
  - c. A chromogenic anti-factor IIa assay.
  - d. A chromogenic anti-factor Xa assay.
  
6. DB is an 85-year-old woman who underwent hip fracture surgery 2 weeks ago, receives warfarin for venous thromboembolism prophylaxis, and comes to the clinic for a checkup. Her INR is 8, but she has no signs or symptoms of bleeding. Besides holding warfarin, which of the following interventions is indicated for DB?
  - a. Vitamin K.
  - b. Fresh frozen plasma (FFP).
  - c. Three-factor prothrombin complex concentrate (PCC) + recombinant factor IIa (rFVIIa).
  - d. No other intervention is needed.
  
7. Which of the following vitamin K doses should be given to DB if she returns a week later with confusion about what medications to take, an INR of 11, and no signs of bleeding?
  - a. 2-2.5 mg orally.
  - b. 5-10 mg orally.
  - c. 2-2.5 mg by subcutaneous injection.
  - d. 5-10 mg slow intravenous (i.v.) injection.
  
8. Which of the following are disadvantages of using FFP for urgent warfarin reversal?
  - a. Delay due to need for thawing and lack of clotting factor VII.
  - b. Delay due to need for thawing and large fluid volume administered.
  - c. Large fluid volume administered and lack of clotting factor VII.
  - d. Large fluid volume administered and high risk of transmission of infectious diseases.
  
9. Which of the following concentrated blood factor products have been used in combination to build a four-factor PCC product for urgent reversal in patients with warfarin-related intracranial hemorrhage (ICH) and elevated INR values in the United States where four-factor PCC products currently are not available?
  - a. FFP + aPCC.
  - b. rFVIIa + three-factor PCC.
  - c. aPCC + three-factor PCC.
  - d. aPCC + rFVIIa.



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10. DR is a 49-year-old man who developed bleeding during rivaroxaban therapy for venous thromboembolism prophylaxis after knee replacement surgery. Based on currently available evidence, which of the following concentrated blood factor products appears most promising for providing urgent reversal of the effects of rivaroxaban for DR?
  - a. FFP.
  - b. Three-factor PCC.
  - c. rFVIIa.
  - d. aPCC.
  
11. As described by Dr. Kalus, the time required between the last dose of dabigatran and surgery needed to prevent perioperative bleeding for patients with impaired renal function should be \_\_\_\_\_ than for patients with normal renal function.
  - a. Shorter.
  - b. Longer.
  - c. The same.
  
12. For which of the following oral anticoagulants is administration of activated charcoal an option for providing urgent reversal of a recently ingested dose?
  - a. Warfarin.
  - b. Dabigatran.
  - c. Rivaroxaban.
  - d. Apixaban.
  
13. An order for a factor product for a warfarin-treated patient with bleeding should trigger the pharmacist to review the patient's medication record to ensure which of the following agents has definitely also been ordered?
  - a. I.V. vitamin K.
  - b. Oral vitamin K.
  - c. Fresh frozen plasma.
  - d. Nothing else; factor products are generally administered as monotherapy.
  
14. RD is a 66-year-old man with AF and a creatinine clearance of 28 mL/min who receives dabigatran 75 mg orally twice daily for stroke prevention. He develops bleeding, and hemodialysis is used to remove dabigatran and reverse its anticoagulant effect. However, a rebound increase in plasma dabigatran concentration is observed after the end of the hemodialysis session. This rebound probably reflects



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- a. The limited renal clearance of the drug.
  - b. The small volume of distribution.
  - c. The large volume of distribution and distribution of the drug into tissues.
  - d. The large volume of distribution and redistribution of the drug from tissues to plasma.
15. Which of the following coagulation tests would be most useful as a qualitative test for the presence of dabigatran in RD after the drug is discontinued?
- a. TT.
  - b. ECT.
  - c. Point-of-care INR.
  - d. A chromogenic anti-factor Xa assay.
16. As described by Dr. Dager, which of the following is recommended as part of developing the systems support necessary in health systems for managing major bleeding in patients on oral anticoagulation therapy?
- a. Assign one pharmacist responsibility for reviewing orders for factor products Monday through Friday.
  - b. Wait to develop guidelines until more evidence-based research is available for specific reversal strategies.
  - c. Develop guidelines of the general process to ensure prompt implementation of reversal options.
  - d. Work with the laboratory to ensure availability of results for specific coagulation tests within 48 hours.



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