

Self-Assessment Test

Confronting the Challenges of Anticoagulation Therapy: New and Emerging Research

The program is located at www.ashpmedia.org/symposia/anticoagulation



This self-assessment test has been provided as a study aid only. At the conclusion of the internet-based program, click on "Take CE Test" to proceed to the ASHP CE Testing Center and take the on-line program post-test. You may print your CE statement immediately after successful completion of the post-test.

There are 25 questions associated with this self-assessment test.

1. In what year was Coumadin (warfarin) first approved by the Food and Drug Administration?
 - a. 1916.
 - b. 1926.
 - c. 1940.
 - d. 1956.

2. Which of the following cytochrome P-450 enzymes is primarily involved in metabolism of the more potent S-enantiomer of warfarin?
 - a. CYP1A1.
 - b. CYP1A2.
 - c. CYP2C9.
 - d. CYP3A4.

3. Which of the following laboratory tests is used to monitor LMWH therapy?
 - a. Anti-Xa.
 - b. Activated partial thromboplastin time (aPTT).
 - c. International normalized ratio (INR).
 - d. No laboratory test is used.

4. Which of the following statements about the usefulness of dose-adjusted warfarin for the prevention of stroke in patients with atrial fibrillation is correct?
 - a. It is harmful.
 - b. It is ineffective.
 - c. It is marginally effective.
 - d. It is highly effective.

5. Which of the following statements about the use of anticoagulant therapy for prevention of venous thromboembolism (VTE) in hospitalized medical patients is correct?
 - a. Unfractionated heparin (UFH), LMWH, and fondaparinux are effective.
 - b. UFH and LMWH are effective but fondaparinux is not.
 - c. Fondaparinux is effective but UFH and LMWH are not.

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- d. UFH, LMWH, and fondaparinux are ineffective.
6. Which of the following is a limitation of warfarin?
- a. Polymorphisms that increase metabolism, reduce dosage requirements, and increase the risk of bleeding are common.
 - b. Polymorphisms that increase metabolism, increase dosage requirements, and increase the risk of thrombosis are common.
 - c. Polymorphisms that impair metabolism, reduce dosage requirements, and increase the risk of bleeding are common.
 - d. Polymorphisms that impair metabolism, increase dosage requirements, and increase the risk of thrombosis are common.
7. Which of the following anticoagulants has the greatest immunogenicity and *in vivo* cross-reactivity?
- a. Dalteparin.
 - b. Enoxaparin.
 - c. Fondaparinux.
 - d. UFH.
8. Which of the following is a characteristic of an “ideal” anticoagulant?
- a. Dosing based on laboratory monitoring.
 - b. Narrow therapeutic window.
 - c. Oral route of administration.
 - d. Slow onset and offset of action.
9. Which of the following emerging anticoagulants is an oral direct thrombin inhibitor?
- a. Apixaban.
 - b. Dabigatran.
 - c. Idraparinux.
 - d. Rivaroxaban.
10. Which of the following is an emerging oral direct factor Xa inhibitor?
- a. Dabigatran.
 - b. Idraparinux.
 - c. Otamixaban.
 - d. Rivaroxaban.
11. Which of the following conclusions was drawn from the Van Gogh trial comparing idraparinux with standard UFH or LMWH followed by a vitamin K antagonist (VKA) for the treatment of deep vein thrombosis (DVT) and pulmonary embolism (PE)?
- a. Idraparinux did not meet criteria for noninferiority to standard therapy for treating DVT or PE.

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- b. Idraparinux was more effective than standard therapy for treating DVT and PE.
 - c. Idraparinux was not inferior to standard therapy for treating DVT and PE.
 - d. Idraparinux was not inferior to standard therapy for treating DVT and did not meet criteria for noninferiority to standard therapy for treating PE.
12. Which of the following statements about the conclusions drawn from the Amadeus study comparing idraparinux with a VKA for prevention of VTE (i.e., stroke) in patients with atrial fibrillation is correct?
- a. Idraparinux did not meet criteria for noninferiority to VKA therapy, and it caused significantly more bleeding.
 - b. Idraparinux did not meet criteria for noninferiority to VKA therapy, and it did not cause significantly more bleeding.
 - c. Idraparinux was not inferior to VKA therapy, but it caused significantly more bleeding.
 - d. Idraparinux was not inferior to VKA therapy, and it did not cause significantly more bleeding.
13. Which of the following statements about the findings of phase III clinical trials comparing rivaroxaban with enoxaparin for the prevention of VTE in patients undergoing total hip or knee replacement surgery is correct?
- a. The risk of DVT, nonfatal PE, and death was significantly higher with rivaroxaban than enoxaparin, and the risk of major bleeding was not significantly different with the two therapies.
 - b. The risk of DVT, nonfatal PE, and death was significantly higher with rivaroxaban than enoxaparin, but the risk of major bleeding was significantly lower with rivaroxaban than enoxaparin.
 - c. The risk of DVT, nonfatal PE, and death was significantly lower with rivaroxaban than enoxaparin, and the risk of major bleeding was not significantly different with the two therapies.
 - d. The risk of DVT, nonfatal PE, and death was significantly lower with rivaroxaban than enoxaparin, but the risk of major bleeding was significantly higher with rivaroxaban than enoxaparin.
14. Which of the following statements best characterizes the findings of the RENOVATE study in which dabigatran was compared with enoxaparin for the prevention of VTE after total hip replacement?
- a. Dabigatran was not inferior to enoxaparin, with a similar risk of major bleeding.
 - b. Dabigatran was not inferior to enoxaparin, with a higher risk of major bleeding.

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- c. Dabigatran was more effective than enoxaparin, with a similar risk of major bleeding.
 - d. Dabigatran was more effective than enoxaparin, with higher risk of major bleeding.
15. A possible explanation for the unexpected findings of the RE-MODEL and RE-MOBILIZE studies comparing dabigatran with enoxaparin for the prevention of VTE is:
- a. The difference in type of surgery in the two studies.
 - b. The difference in enoxaparin dosing regimen in the two studies.
 - c. The lack of double blinding in the RE-MODEL study.
 - d. The small number of patients in the RE-MODEL study.
16. Which of the following statements about the Joint Commission National Patient Safety Goal for anticoagulants is correct?
- a. It applies to only therapeutic uses (not prophylactic uses), although devoting attention to prophylactic uses is worthwhile.
 - b. It applies to only therapeutic uses (not prophylactic uses), so devoting attention to prophylactic uses is wasteful.
 - c. It applies to both therapeutic uses and prophylactic uses.
 - d. It applies to only prophylactic uses (not therapeutic uses), although devoting attention to therapeutic uses is worthwhile.
17. Which of the following is a Joint Commission implementation expectation based on its National Patient Safety Goal for anticoagulants?
- a. Use of programmable infusion pumps to ensure consistent and accurate dosing of continuous intravenous heparin.
 - b. Use of anticoagulants only if provided in oral unit doses, prefilled syringes, or premixed bags.
 - c. A written protocol outlining the appropriate dosage and target INR for warfarin therapy.
 - d. A written policy for baseline and ongoing laboratory tests for monitoring UFH and LMWH on a daily basis.
18. Which of the following organizations spearheaded development of National Consensus Standards for Prevention and Care of VTE?
- a. The Joint Commission and Centers for Medicare and Medicaid Services (CMS).
 - b. The Joint Commission and National Quality Forum (NQF).
 - c. The NQF and Institute for Safe Medication Practices.
 - d. The National Committee for Quality Assurance and U.S. Pharmacopeia.

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19. The number of National Consensus Standards for Prevention and Care of VTE measures approved in May 2008 is:
 - a. 4.
 - b. 6.
 - c. 10.
 - d. 19.

20. Which of the following is among the National Consensus Standards for Prevention and Care of VTE?
 - a. The incidence of anticoagulant-induced bleeding.
 - b. The incidence of potentially preventable VTE.
 - c. The percentage of patients receiving warfarin for VTE prophylaxis with the INR in the therapeutic range.
 - d. The percentage of patients receiving UFH by continuous intravenous infusion for VTE treatment with the aPTT in the therapeutic range.

21. Which of the following is an accepted Surgical Care Improvement Project (SCIP) process measure for VTE?
 - a. Use of appropriate laboratory tests for monitoring prophylactic anticoagulant therapy in surgical patients.
 - b. Receipt of appropriate VTE prophylaxis within 2 hours before or after surgery.
 - c. Receipt of appropriate VTE prophylaxis within 24 hours before or after surgery.
 - d. Incidence of VTE within 30 days after surgery.

22. In 2008, which of the following was a consequence of failure to report SCIP process measures in 2007?
 - a. Loss of Joint Commission accreditation.
 - b. Reduction in Medicare reimbursement by 2.0%.
 - c. Reduction in Medicare reimbursement by 100%.
 - d. Sanction by state health regulators.

23. Which of the following is among the characteristics of secondary diagnoses selected by CMS for penalties for lack of prophylaxis in its acute care hospital inpatient prospective payment system beginning in October 2008?
 - a. High cost, high volume, or avoidable with the use of evidence-based guidelines.
 - b. High cost, low volume, or avoidable with the use of evidence-based guidelines.
 - c. Low cost, high volume, or avoidable with the use of evidence-based guidelines.
 - d. High cost, high volume, or unavoidable because of a lack of evidence-based guidelines.