Health Care Professional
Anticoagulation Competency

Objectives
- To have a thorough understanding of the mechanism of action and dosing of anticoagulants, specifically in regards to warfarin and low molecular weight heparins (LMWH).
- To be familiar with the possible side effects of anticoagulants and be able to describe to patients symptoms that they may experience.
- To understand how to handle elevated INR's according to the CHEST guidelines.
- To be familiar with available anticoagulation resources and forms and appropriate documentation.

Choose the one correct answer for each of the following questions. A potential resource to assist in answering the questions has been included at the end of each question.

1. How does warfarin work to inhibit clot formation? (Warfarin Patient Education Booklet)
   a. It actually “thins” the blood
   b. It antagonizes vitamin K which is needed to form clots
   c. It antagonizes vitamin E which is needed to form clots
   d. It works with Vitamin K to inhibit clot formation

2. Which of the following is not an appropriate indication for warfarin therapy? (Recommendations for Target INR Range and Duration of Therapy for Warfarin Therapy)
   a. Atrial fibrillation
   b. Mitral valve replacement
   c. Hypercholesterolemia
   d. DVT or PE

3. For an elderly person with liver disease, what dose of warfarin should he or she be started on? (Recommendations for Initiation of Warfarin Therapy)
   a. 2.5 mg
   b. 5 mg
   c. 10 mg
   d. 15 mg
4. What lab work must a patient taking warfarin routinely have checked? (Recommendations for Initiation of Warfarin Therapy)
   a. PT / INR
   b. ALT / AST
   c. BUN / SCr
   d. Hgb / Hct

5. Which of the following are common goal INR ranges? (Recommendations for Target INR Range and Duration of Therapy for Warfarin Therapy)
   a. 2 – 3
   b. 2.5 – 3.5
   c. 4 – 5
   d. Both a. and b. are correct

6. If a patient is experiencing a DVT, which of the following symptoms might they experience? (Topic Two: What Are The Signs and Symptoms That I Should Watch For On Warfarin Therapy?)
   a. Redness of the extremity
   b. Swollen extremity
   c. Warmth to the touch of the extremity
   d. All of the above

7. Which of the following can be used to reverse high INR’s and bleeding with warfarin? (Guidelines for Warfarin Reversal with Vitamin K)
   a. Small (1-2 mg) doses of oral vitamin K (aquamephyton)
   b. Transfusions of packed cells
   c. Protamine sulfate
   d. a. and b. are both possible options

8. Which of the following routes of administration is predictably effective, safer, more convenient, and thus the preferred way to administer vitamin K? (Guidelines for Warfarin Reversal with Vitamin K)
   a. Oral
   b. Intramuscular
   c. Intravenous
   d. Subcutaneous

9. If coadministered with warfarin, which of the following medications can cause dangerous rises in the INR? (Warfarin Drug-drug, Drug-food, Drug-lab Interactions)
   a. Bactrim (trimethoprim/sulfamethoxazole)
   b. Tricor (fenofibrate)
   c. Cordarone (amiodarone)
   d. All of the above
10. If coadministered with warfarin, which of the following can cause INR’s to decrease? (Warfarin Drug-drug, Drug-food, Drug-lab Interactions)
   a. Zocor (simvastatin)
   b. St. John’s Wort
   c. Tegretol (carbamazepine)
   d. b. and c. are both correct

11. When evaluating a patient’s INR, which one of the following factors does **not** need to be considered? (Guidelines for Warfarin Maintenance)
   a. Exercise
   b. Diet
   c. Missed dose of warfarin
   d. Change in medication

12. If a patient misses a dose of warfarin, what should he or she be instructed to do? (Warfarin Patient Education Booklet)
   a. Notify the healthcare provider
   b. Take an extra dose the next day
   c. Skip the missed dose and continue with their normal dosing regimen
   d. Both a. and c. are correct

13. Once a patient’s warfarin therapy is stopped, how long will the anticoagulation effects last? (Warfarin Patient Education Booklet)
   a. End immediately
   b. Gone the next day
   c. About 2 – 5 days
   d. Last 1 – 2 weeks

14. What is the longest amount of time that a patient should go between having their INR checked? (Recommendations for Initiation of Warfarin Therapy)
   a. 12 weeks
   b. 8 weeks
   c. 4 weeks
   d. 2 weeks

15. True or false. Patients taking warfarin should avoid all green vegetables. (Topic Four: How Does My Diet Effect Warfarin)
   a. True
   b. False

16. True or false. All patients undergoing dental surgery must stop warfarin before the procedure. (Managing Oral Anticoagulation During Invasive Procedures)
   a. True
   b. False
17. True or false. It is ok for patients to cut warfarin tablets in half.
   a. True
   b. False

18. Low Molecular Weight Heporins (LMWH) should be given by which route?
    (Managing Oral Anticoagulation During Invasive Procedures)
    a. Oral
    b. Intravenous
    c. Subcutaneous
    d. Intramuscular

19. Low Molecular Weight Heporins (LMWH) should be overlapped with warfarin for a
    minimum of how many days? (Recommendations for Initiation of Warfarin Therapy)
    a. 1 – 2 days
    b. 2 – 3 days
    c. 3 – 4 days
    d. 4 – 5 days

20. If a patient has been switched from warfarin to Lovenox for an upcoming surgery, when
    should the patient take their last dose of Lovenox? (Managing Oral Anticoagulation During
    Invasive Procedures)
    a. 12 – 24 hours before surgery
    b. 36 – 48 hours before surgery
    c. 1 – 2 hours before surgery
    d. 6 – 8 hours before surgery
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Answer Key

1. B. Warfarin antagonizes the effects of Vitamin K, thus inhibiting clot formation.

2. C. Warfarin is used to treat atrial fibrillation, valve replacements, DVTs, and PEs. It is not used to treat elevated cholesterol.

3. A. Patients who meet any of the following criteria should be started on low dose warfarin (2.5 mg): elderly, malnourished, liver disease, high bleeding risk, CHF exacerbation, or taking interacting drugs. Otherwise patients should normally be started on 5 mg daily.

4. A. Patients taking warfarin need to have their PT/INR checked regularly no matter how long they have been taking warfarin.

5. D. Common INR ranges for patient on warfarin are 2 – 3 and 2.5 – 3.5. Occasionally other ranges may be desired by the physician. A range of 4 – 5 though is too high and puts the patient at a much higher risk of bleeding complications.

6. D. A patient with a DVT may complain of redness, swelling, and warmth to the touch of the extremity.

7. D. Elevated INRs can be treated with small doses of oral vitamin K or transfusions of packed cells. Protamine sulfate is used to reverse the effects of heparin and LMWH and will not help to lower the INR.

8. A. The oral route is the preferred way to administer vitamin K, although in certain circumstances the other routes may be warranted.

9. D. All of the medications listed can increase a patient’s INR and put them at risk of bleeding complications. If a patient is started on one of the medications, their INR should be checked frequently until their dose is restabilized.

10. D. Both St. John’s Wort and Tegretol can cause a patient’s INR to decrease, causing their therapy to subtherapeutic. Zocor can cause a patient’s INR to increase. If a patient is started
on one of the medications, their INR should be checked frequently until their dose is restabilized.

11. A. When evaluating a patient’s INR, one must consider the patient’s diet, change in medications, and if they missed any doses of the warfarin. Each of these can cause a patient’s INR to be out of range.

12. D. If a patient misses a dose of warfarin, he or she should skip the dose (if it is now the next day) and not double up on the dose the next day. He or she also needs to notify their healthcare provider.

13. C. Once warfarin is stopped, the anticoagulation effects can last for 2 – 5 days. This needs to be taken into consideration when the patient has an upcoming surgery.

14. C. It is recommended that patients have their INR checked at least every 4 weeks or sooner, if appropriate.

15. B. Patients on warfarin do not have to avoid all green vegetables. What is important is that they try to eat a consistent amount from day to day.

16. B. In most instances, only patients at a high risk of bleeding need to stop warfarin before a dental procedure. Check with each dentist if there are any concerns.

17. A. Warfarin tablets can be cut in half. Most, if not all, brands are scored to make this easier for patients.

18. C. LMWH should be given subcutaneously.

19. D. LMWH should be overlapped with warfarin for a minimum for 4 – 5 days and until the INR has been therapeutic for at least 2 days.

20. A. In most cases, the patient should take their last dose of Lovenox 12 – 24 hours before the surgery so that the anticoagulation effect will be worn off by the time the surgery takes place. Depending on the surgery being done, the patient may be able to restart the Lovenox that same evening.