VENOUS THROMBOEMBOLISM MANAGEMENT

SUMMARY
This skill discusses the risk of venous thromboembolism affecting a patient with cancer. Preventive measures, presentation, diagnostic testing, and the management of venous thromboembolism are also reviewed

ALERT
Venous thromboembolism (VTE) is a categoric term that describes both deep vein thrombosis (DVT) and pulmonary embolism (PE). The common denominator of these terms is the development of a blood clot. A patient with cancer has a high risk of developing a VTE

OVERVIEW
VTE can occur when certain circumstances or risk factors such as hypercoagulability, endothelial injury, or inflammation are present. A DVT is a thrombus or blood clot that has formed in a deep vein, such as the femoral vein. It is a common cause of morbidity and mortality in patients with cancer and most commonly presents as thrombosis of a lower extremity vein, although upper extremity veins may also be affected. DVTs may be classified as proximal (in or superior to the popliteal vein) or distal (inferior to the popliteal vein). An important distinction of a DVT is that the blood clot formation remains in a blood vessel.
A blood clot formation that travels through the vascular system into the lungs is known as a PE. A PE is an immediate life-threatening condition; the morality rate of those who develop a PE is exceptionally high. Without treatment, about half of all patients with DVT develop a PE.
Patients with cancer are at higher risk for developing VTE because the prothrombic state of malignancy can activate the coagulation system. Thrombosis increases the likelihood of death in those with cancer by two-fold to six-fold. Thromboembolism is the most common cause of death 30 days postoperatively among patients with cancer. VTE may be the first sign of a previously undiagnosed cancer.
Blood stasis and inflammation can also contribute to an increased risk of VTE. Certain cancers are more often associated with thromboembolic events. The occurrence of VTE is a poor prognostic sign in the patient with cancer. Certain chemotherapy and biotherapy agents, and nitrogen mustard analogues increase the risk of VATE. Other risk factors associated with VTE are smoking, older age, and immobility. In many cases, upper extremity venous thrombosis is caused by venous access devices
Because of the frequency of thromboembolism and the associated morbidity and mortality, vigilant assessment and aggressive prophylaxis and treatment are warranted. Unless there are contraindications, prophylaxis is recommended for all admitted patients with cancer, those undergoing major surgery, and those receiving thrombogenic treatments, such as lenalidomide or thalidomide with dexamethasone.
Patients with a DVT may experience typical symptoms such as pain, heaviness, swelling, and discoloration of the involved extremity. The physical examination may reveal a palpable cord, warmth, redness, pain, swelling, and low-grade fever. These signs are not diagnostic, and their absence does not rule out a DVT. Signs of a PE also are not diagnostic. Patients may experience shortness of breath, chest pain, or hemoptysis; on examination, the nurse may find hypoxemia, a pleural rub, fever, and tachycardia.

The nurse should assess the patient for risk factors associated with VTE and assist the patient in understanding prophylactic measures that may decrease his or her risk. Nurses must be alert to signs and

symptoms of VTE. The nurse should explain the ordered diagnostic tests and prescribed treatments, which may include unfractionated heparin, low-molecular-weight heparin, inferior vena cava filter, and warfarin. The usual duration of treatment for a DVT is 30 to 6 months; for a PE, it is 6 to 12 months. Anticoagulation therapy may continue indefinitely if active cancer is present or other ongoing risk factors are present.

Vitamin K can lessen warfarin's effectiveness. Patients do not have to avoid foods that contain vitamin K, but these foods should be eaten in about the same amounts every day so that the daily dose of warfarin does not have to be adjusted. Foods rich in vitamin K include green tea and green leafy vegetables. The nurse is instrumental in providing patient education regarding treatment measures that help ensure safe and efficacious treatment.

EQUIPMENT

Ensure that all necessary supplies and durable medical equipment are available before the home visit

- Alcohol wipes
- Educational handouts
- Gloves
- Injection supplies
- Medication calendars
- Patient's record
- Prescriptions
- Treatment plan or order
- Supplemental oxygen

PROCEDURE

1. Perform hand hygiene and don gloves
2. Introduce yourself to the patient
3. Verify the correct patient using two identifiers
4. Explain the procedure to the patient and ensure that he or she agrees to treatment
5. Verify the practitioner's order and assess the patient for pain
6. Review the patient's record and treatment plan
7. Prepare an area in a clean, convenient location, and assemble the necessary supplies
8. Complete a thorough patient history
    a. Risk factors for VTE
    b. Current medications
    c. Alternative treatments or medications
    d. Over-the-counter medications
    e. Comorbidities
    f. Medical history
9. Review the results of diagnostic testing performed, if available
    a. Duplex venous ultrasonography (most common)
    b. Venography
    c. Contrast venography
    d. Impedance plethysmography

    e. Magnetic resonance venography
    f. Computed tomography venography
10. Administer anticoagulation therapy as prescribed. Bleeding is the major complication of anticoagulation therapy. Do not administer anticoagulation therapy to a patient with active bleeding, recent surgery with a high bleeding risk, thrombocytopenia or platelet dysfunction, or abnormalities of clotting factors.
    Exercise caution with a patient who has a history of stroke, who is receiving spinal or epidural anesthesia, or who is undergoing spinal puncture.
    a. Unfractionated heparin (IV or subcutaneous) and warfarin. Do not administer unfractionated heparin and warfarin to a patient with underlying coagulopathy, a recent surgical procedure, thrombocytopenia, recent trauma, central nervous system disease (e.g., stroke, brain metastases), severe and uncontrolled hypertension, active bleeding, or allergy
        i. Discontinue heparin once the international normalized ratio (INR) is reached and stabilized at a therapeutic level for the time period (e.g., 2 days, 3 days) as ordered by the practitioner
        ii. Ensure frequent laboratory testing (e.g., prothrombin time [PT/INR] activated partial prothrombin time [PTT], platelet count). Dose adjustments are based on INR results
    b. Low-molecular weight heparin or fondaparinux. Do not administer low-molecular weight heparin or fondaparinux to a patient wit severe renal failure. Unfractionated heparin is recommended over low-molecular weight heparin in these patients
        i. Begin warfarin after initiation of low-molecular weight heparin and continue this combination therapy, overlapping the two agents for at least 1 or 2 days. Once INR has been reached and stabilized at a therapeutic level for at least 2 consecutive days, discontinuing low-molecular weight heparin.
        ii. Most patients do not need frequent laboratory coagulatory monitoring
    c. Warfarin
        i. Typical dosing begins at 10 mg/day and then s adjusted according to PT/INR results
        ii. Begin concomitant therapy with unfractionated heparin, low-molecular-weight heparin, or fondaparinux, as ordered by the practitioner
11. Prepare the patient for the surgical placement of an inferior vena cava filter, if prescribed
12. Provide supplemental oxygen during an acute episode of PE, if prescribed
13. Encourage early and frequent ambulation and resumption of normal activities to tolerance
14. Instruct and encourage the regular use of fitted, graduated elastic compression stockings, as prescribed
15. Notify the patient of any dosage changes to his or her prescribed medications
16. Continue monitoring for signs and symptoms of DVT or PE
17. Monitor laboratory results closely
18. Assess the patient's adherence to medication and laboratory testing
19. Monitor prescribed laboratory testing and report abnormal results to the practitioner
20. Assess the patient's compliance with anticoagulation therapy

21. Consult the practitioner for instructions if invasive procedures (e.g., surgery) require temporary discontinuation of anticoagulation therapy. Resumption of anticoagulation therapy should occur as soon as it can be safely administered
22. Assess, treat, and reassess pain
23. Discard supplies, remove gloves, and perform hand hygiene
24. Document the procedure in the patient's record

PATIENT AND FAMILY TEACHING

- Encourage the patient to have his or her caregiver present at the educational session
- Assess for barriers to education, including language barriers, stress and anxiety levels, readiness to learn, level of education completed, illiteracy, and sensory deficits
- Before providing education, determine the patient's preferred language and have a professional interpreter present, if needed
- Include all the important elements of VTE education, including when to call the practitioner
- Provide education in written form (and other media) whenever possible
- Encourage questions and answer them as they arise

REFERENCES

Bonner, L., Johnson, J. 2014
Farge-Bancel, D. and others 2014
Holbrook, A. and others 2012
National Comprehensive Cancer Network (NCCN) 2014

ADDITIONAL READINGS

None