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## Venous Thromboembolism in Patients With Cancer Part II

# Current Treatment Strategies

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Patients with cancer have an increased risk of venous thromboembolism (VTE). Several factors contribute to the thrombogenic risk for this patient population, including stasis, hypercoagulability from treatment or the tumor itself, and vascular endothelial damage from neoplastic disease or procedures performed on patients. Treatment of VTE for patients with cancer usually involves a sequential combination of unfractionated heparin (UFH) or low-molecular-weight heparin (LMWH), followed by oral warfarin therapy or LMWH for continued anticoagulation. The goal of this treatment is to protect against further complications with the existing thrombus or clot and to reduce or protect against further embolic events. Despite appropriate treatment with oral anticoagulant therapy, many patients with cancer suffer from recurrent thrombosis. Reasons for inadequate anticoagulant response of patients with cancer include the possibility of Trousseau syndrome, a condition characterized by persistent low-grade intravascular coagulation (Callander & Rapaport, 1993). Additionally, patients with cancer have increased bleeding complications compared with patients without malignancy (Schafer, Levine, Konkle, & Kearon, 2003).

### Anticoagulation Treatment in Patients With Cancer

Anticoagulation treatment in patients with VTE and cancer may be challenging secondary to the high risk of bleeding in these patients and the high rate of recurrence even

Patients with cancer have an increased risk of thromboembolism. This complication is connected to a variety of different factors and is influenced by the conditions described in Virchow's triad: stasis, vascular endothelial damage, and hypercoagulability. Once thromboembolism is diagnosed, treatment in patients with cancer usually involves anticoagulation with unfractionated or low-molecular-weight heparin and progression to oral anticoagulant therapy. Duration of treatment is usually three to six months, with most patients receiving six months of anticoagulation. Patients with cancer may be at risk for recurrent thrombosis as well, despite optimal use of oral anticoagulant therapy, and some of these patients may require lifelong heparin therapy. This article describes the current treatment regimens to provide anticoagulation therapy to patients with cancer, including a discussion of the low-molecular-weight heparins and dosing parameters. Nursing interventions to help provide these treatments safely are discussed. Patients with cancer have a high rate of thromboembolism; oncology nurses should heighten their awareness of this important complication, treatment options, and appropriate nursing interventions.

**Key Words:** thromboembolism, heparin, blood coagulation

with therapeutic anticoagulation regimens (Hutten et al., 2000). Historically, treatment of VTE in patients with cancer mimics management of VTE in the general population. Treatment traditionally was initiated with UFH, with eventual conversion to a vitamin K antagonist such as warfarin. Use of UFH requires frequent testing of adjusted prothrombin time (aPTT) to determine the therapeutic level of drug, necessitating patients to undergo laboratory evaluation and venipuncture.

Understanding in the structure of heparin has led to the development of LMWH, synthetic heparin mimetics, antithrombin

(AT), and anti-Xa agents that now compete with UFH for specific indications, including management of VTE. The high risk for recurrence of thrombosis in cancer has initiated reevaluation of historic strategies of long-term anticoagulation therapy with vitamin K antagonists versus long-term treatment with LMWH (Lee et al., 2003). The indications that LMWH may have direct anticancer effects also have increased support of these agents for patients with VTE and cancer (Levine, Lee, & Kakkar, 2003). A recent study looked at patients with advanced malignancy (N = 385) receiving dalteparin once daily versus placebo (Kakkar et al., 2004). Although LMWH did not significantly improve one-year survival, a subgroup of patients with a better prognosis was observed to have impaired survival, suggesting a possible effect of dalteparin on biology of the tumor (Kakkar et al.).

*Pamela Hallquist Viale, RN, MS, CS, ANP, OCN®, and Rowena N. Schwartz, PharmD, BCOP, have lectured for Pharmion Corporation and other pharmaceutical companies and received an honorarium for this article. This article was a result of a joint project with Oncology Education Services, Inc., which assisted (along with Judy DePalma, PhD, RN) with development of the venous thromboembolism survey, distributed the survey to selected Oncology Nursing Society members, and compiled the data results for the authors. (Submitted February 2004. Accepted for publication May 31, 2004.)*

Digital Object Identifier: 10.1188/04.CJON.465-469