

# The Use of Low-Dose Warfarin as Prophylaxis for Central Venous Catheter Thrombosis in Patients With Cancer: A Meta-Analysis

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**Purpose/Objectives:** To determine whether the use of low-dose warfarin could reduce the incidence of thrombosis in patients with cancer who have a central venous catheter (CVC).

**Data Sources:** MEDLINE®, CINAHL®, CANCELIT®, EMBASE®, and the Cochrane Library.

**Data Synthesis:** Meta-analysis of four studies (N = 1,236 patients) revealed that 6.4% of warfarin-treated patients experienced a thrombotic event compared with 7.5% in the control (no treatment) group. The risk difference for thrombus formation was not significant (2.0%, confidence interval = -9.0% to 5.0%).

**Conclusions:** The administration of warfarin did not reduce the incidence of symptomatic or asymptomatic CVC-associated thrombosis in patients with cancer.

**Implications for Nursing:** Using research findings to inform clinical nursing practice is important in caring for patients and providing optimal and improved patient outcomes. Prophylactic use of low-dose warfarin may not prevent thrombus formation and is associated with potentially adverse patient outcomes.

One in 200 patients with cancer will experience venous thromboembolism (Lee & Levine, 2003), the second-leading cause of death in these patients (Agnelli, 1997; Sorensen, Mellemkjaer, Olsen, & Baron, 2000). Many factors contribute to the development of thrombus in the oncology population. For example, tumor cells and their products can activate the body's coagulation and fibrinolytic systems. In addition, comorbid states (e.g., bed rest, surgery, infection, chemotherapy) and the use of central venous catheters (CVCs) can stimulate coagulation and contribute to hypercoagulable states (Kakkar & Williamson, 1998; Lip, Chin, & Blann, 2002; Prandoni, Piccioli, & Girolami, 1999).

Because deep vein thrombosis, pulmonary embolism, and CVC thrombosis all can lead to complications, clinicians need effective prevention strategies. The standard treatment for thrombosis is the use of anticoagulants. However, the use of low-dose warfarin is unclear regarding prophylaxis for the prevention of thrombosis in patients with cancer who have CVCs because of the potential for complications. The development of complications from anticoagulants is associated with patient age and gender, the presence of malignancy, and the length of time on anticoagulant therapy. The most serious complication with anticoagulants is major hemorrhage. The risk is estimated to be as high as 1% for every month on therapy (Levine, Raskob, Landefeld, & Kearon, 2001) and

## Key Points . . .

- Cancer is a chronic hypercoagulable state that increases the risk of thromboembolism.
- Central venous catheter-related thrombosis is a common complication and a significant cause of morbidity and mortality in patients with cancer.
- The routine use of low-dose warfarin as prophylaxis does not significantly reduce the incidence of thrombus formation and is associated with potentially adverse patient outcomes.

increases exponentially when the international normalized ratio (INR) rises to 4.5–5.0 (Hylek et al., 2001; Pineo & Hull, 2003).

Patients with cancer tend to experience greater difficulty maintaining INRs in the therapeutic value range, with INRs exceeding 4.5 for longer durations (Bona, Sivjee, Hickey, Wallace, & Wajcs, 1995; Hylek et al., 2001). This may result from the disease process, cancer medications, or the hypercoagulable state of many patients. Thus, the administration of anticoagulants to patients with cancer often requires frequent monitoring and dose modifications. Anticoagulant use has disadvantages, including adverse events, demands on patients' and clinicians' time, the number of interventions required, and costs to the healthcare system. A low-dose anticoagulant would be desirable if it did not require frequent monitoring and proved efficacious (Coccheri, Palareti, & Cosmi, 1999).

Research on low-dose anticoagulant therapy was conducted first on surgical patients (De Takats, 1950). By the late 1980s, researchers had concluded that warfarin caused no changes in prothrombin time or the levels of clotting factors II, VII, IX, and X (Bern et al., 1990). Because no blood test effectively measures the subtle changes in coagulation

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