

# Venous Thrombosis and the Pharmacist

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The prevention and management of venous thromboembolism have become increasingly important clinical issues that cross many professional and subspecialty boundaries. Better identification of risk factors, improvements in the diagnosis and treatment of thromboembolic disorders, and greatly expanded knowledge related to thromboprophylaxis have presented new challenges for the delivery of evidence-based care. Accumulating data and subsequent recommendations in this area are collected every 3 years in the American College of Chest Physicians Consensus Conference on Antithrombotic Therapy and published as a supplement to the journal *Chest*,<sup>1</sup> an issue that is widely read by interested hospital pharmacists and physicians.

There are many centres of excellence in clinical thromboembolism in North America, all of which are clustered at tertiary care teaching hospitals. At the vast majority of community hospitals, thrombosis prevention and management are not the responsibility of any one practitioner but rest mainly in the hands of physicians in a variety of specialties including hematology, cardiology, internal medicine, orthopedics, and vascular surgery. Most long-term anticoagulation for ambulatory patients is managed by family physicians. Yet we believe that pharmacists are well suited to take on responsibilities in this area, and our purpose in writing this editorial is to try to expedite this transfer of responsibility from physician to pharmacist.

Recent studies and surveys have shown that the application of evidence-based practice in several aspects of management of venous thromboembolism could be significantly improved. For example, thromboprophylaxis is frequently underutilized both in general medical inpatients and after high-risk abdominal surgery, whereas the reversal of warfarin overanticoagulation with vitamin K is frequently inappropriate<sup>2-4</sup> (Panju A.

Hamilton area audit of thrombo-prophylaxis in general medical inpatients; unpublished data). In 2001, the Agency for Healthcare Research and Quality published a report entitled "Making Health Care Safer: A Critical Analysis of Patient Safety Practices"<sup>5</sup> in response to the Institute of Medicine's analysis of "medical" error.<sup>6</sup> This systematic review ranked 79 patient safety interventions on the basis of the strength of the evidence<sup>7</sup> supporting their more widespread implementation. The highest-ranked safety practice was the "appropriate use of prophylaxis to prevent venous thromboembolism in patients at risk". This ranking was based on strong evidence that thromboprophylaxis reduces adverse patient outcomes as well as overall costs.

We believe that greater involvement by pharmacists would enhance many facets of venous thromboembolism prevention and management. Cohort studies<sup>8</sup> and a randomized controlled trial<sup>9</sup> have shown that patients whose care is managed in pharmacist-run anticoagulation clinics do as well as or better than those treated in standard individual physician practices. We and others have shown that a pharmacist-managed inpatient anticoagulation program for people who have



received cardiac valve replacements improves several measures of patient management<sup>10,11</sup>; in our program, the pharmacist is an independent, nonprotocol prescriber of warfarin and vitamin K. As part of this service, we have now developed an algorithm to detect and follow heparin-induced thrombocytopenia.<sup>12</sup>

Outpatient management of acute venous thromboembolism has now been shown to be feasible for most patients, and we think that pharmacists would be the ideal practitioners for both coordinating these programs and managing patients' anticoagulation. Furthermore, an increase in the availability of pharmacist-directed anticoagulation clinics could improve the management of a variety of other thromboembolic scenarios with only a modest additional expenditure of resources. For example, appropriate perioperative management of patients receiving oral anticoagulants requires knowledge of the duration of action of the various anticoagulants and the risk of thrombotic or bleeding events in individual patients; involvement of a pharmacist would probably prevent unnecessary use of hospital days before and after the surgery and could optimize the appropriate use of low-molecular-weight heparins.

A small but increasing number of hospital pharmacists in Canada are managing selected aspects of venous thromboembolism care, and programs to train selected community pharmacists to manage oral anticoagulation in ambulatory patients are under way. We encourage directors of hospital pharmacies, clinical managers, and physician-administrators to provide or redirect resources for pharmacist training and for accreditation and maintenance of pharmacist-directed thrombosis management programs in our institutions. Doing so will have the desired effects of improving patient care, freeing up physician time for other patient care priorities, and possibly enhancing career satisfaction for pharmacists.

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