Low-Molecular-Weight Heparins Versus Unfractionated Heparin for Thromboprophylaxis in Surgery, Cancer, and General Medicine

Context
Venous thromboembolism (VTE) is a leading cause of morbidity and mortality in hospitalized general medical and surgical patients. VTE is a collective term that refers to both deep vein thrombosis and pulmonary embolism. Deep vein thrombosis is the formation of a blood clot in a vein, usually in the legs. When a clot dislodges and travels to the lungs, it causes a pulmonary embolism. Hospitalized patients tend to be at a significant risk for VTE.

Technology
Medications used for thromboprophylaxis (prevention of VTE) include low-molecular-weight heparins (LMWHs) and unfractionated heparin (UFH). LMWHs available in Canada include enoxaparin, tinzaparin, dalteparin, and nadroparin. Clinical studies show that LMWHs given once or twice a day may be safer and more effective than UFH.

Issue
Although LMWHs may be more clinically advantageous than UFH for major bleeding, recurrence of VTE, and mortality rate, their price is about three times higher. However, there are additional costs to consider, such as for physician services and the administration of treatment, as well as costs related to complications. Another consideration is the safety profile of LMWH compared with UFH in terms of heparin-induced thrombocytopenia (low blood platelet count) and bleeding risk. A review of the cost-effectiveness and safety profile of LMWH versus UFH for thromboprophylaxis in patients following surgery, patients with cancer, and in the general medical population will help inform decisions regarding thromboprophylaxis in these patients.

Methods
A limited literature search was conducted of key resources, and titles and abstracts of the retrieved publications were reviewed. Full-text publications were evaluated for final article selection according to predetermined selection criteria (population, intervention, comparator, outcomes, and study designs).

Key Messages
- To prevent post-operative VTE following cancer surgery, UFH is more cost-effective than LMWH.
- To prevent VTE in general medical patients, LMWH is more cost-effective than UFH.
- In patients following surgery, LMWH is safer than UFH in heparin-induced thrombocytopenia and bleeding risk.
- In the general medical population, LMWH is as safe or safer than UFH in heparin-induced thrombocytopenia and bleeding risk.

Results
The literature search identified 978 citations. Of these, 52 were deemed potentially relevant, and 34 met the criteria for inclusion in this review: 18 comparing the cost-effectiveness, and 16 comparing the safety profile, of LMWH versus UFH.