

# The Credit Valley Hospital – CLINICAL PRACTICE GUIDELINES

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**Issued By:** Dr. Mathias Gysler, Chief of Medical Staff

## **Title: Venous Thromboembolism Prophylaxis CPG**

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### **PURPOSE**

To provide guidelines for the selection and management of patients for which it is appropriate to administer venous thromboembolism prophylaxis.

NOTE: The CVH guidelines are adapted from The Eighth American College of Chest Physicians (ACCP) Conference on Antithrombotic and Thrombolytic Therapy: Evidence-Based Guidelines. They contain pertinent recommendations that apply to the majority of patients admitted to Credit Valley Hospital. For additional information, refer to the complete guidelines available at <http://www.chestnet.org>

### **SELECTION CRITERIA**

The following target population(s) should be considered for VTE prophylaxis.

Inclusion criteria:

1. Patients undergoing surgery, such as;
  - a. Major general, vascular, gynecologic, urologic and laparoscopic surgery
  - b. Major thoracic
  - c. Hip and knee arthroplasty and hip fracture repair
  - d. Elective spine surgery
2. Patients admitted to hospital with major trauma, lower extremity injuries, or burns
3. Medical patients with risk factors for thromboembolism (Table 1.)
4. Cancer patients
5. Critical care patients

Exclusion criteria:

1. Patient on long term anticoagulation pre-admission AND restarted on therapeutic anticoagulation within 2 days post surgery

Table 1: Risk Factors for Thromboembolism

Surgery	<b>Inherited or acquired thrombophilia *</b>
<b>Trauma (major or lower extremity) *</b>	Nephrotic syndrome
Increasing age – (no age threshold)	Myeloproliferative disorders
<b>Cancer and cancer therapy *</b>	Immobility, paresis
<b>Previous VTE *</b>	Acute medical illness
<b>Inflammatory bowel disease *</b>	Heart or respiratory failure
Obesity, moderate or marked	<b>Stroke *</b>
Smoking	Paroxysmal nocturnal hemoglobinuria
Varicose veins	Central venous catheterization
Estrogen use	Pregnancy and Postpartum

\*Major Risk Factors

### General Recommendations:

- In all patients undergoing neuraxial anesthesia or analgesia, special caution when using anticoagulant prophylaxis is recommended (Grade 1A).
- For patients receiving deep peripheral nerve blocks, cautions considered for neuraxial techniques are to be applied when using anticoagulant thromboprophylaxis (Grade 1C).
- Routine use of Doppler ultrasonography screening at the time of hospital discharge in asymptomatic patients following major orthopedic surgery is NOT recommended (Grade 1A).
- Mechanical methods of prophylaxis should be used in patients who are at high risk of bleeding (Grade 1A) or as an adjunct to anticoagulation-based prophylaxis (Grade 1C). The application of mechanical devices should comply with manufacturer recommendations.
- Consideration be given to patients with renal impairment when deciding on doses of LMWH, fondaparinux, the direct thrombin inhibitors, and other antithrombotic drugs, that are cleared by the kidneys, particularly in elderly patients with diabetes mellitus and those who are at high risk for bleeding (Grade 1A). Avoid use of an anticoagulant that bioaccumulates in the presence of renal impairment, using a lower dose of the agent, or monitoring the drug level or its anticoagulant effect (Grade 1B).
- On admission to a critical care unit, all patients should be assessed for their risk of VTE and most patients should receive VTE prophylaxis (Grade 1A).

### **DEFINITIONS**

#### Abbreviations:

VTE: Venous thromboembolism

LMWH: Low molecular weight heparin

LDUH: Low dose unfractionated heparin

TKA: Total knee arthroplasty

THA: Total hip arthroplasty

HFS: Hip fracture surgery

GCS: Graduated compression stockings

IPC: Intermittent pneumatic compression

VKA: Vitamin K antagonist

INR: International normalized ratio

Minor surgery: Entire procedure done laparoscopic and/or duration less than 60 minutes (skin to skin).

Major surgery: General +/- Regional Anesthetic and duration greater than or equal to 60 minutes (skin to skin).

### **ASSESSMENT, PREVENTATIVE TREATMENT AND MONITORING**

1. Risk assessment will be done on all admitted patients (Table 1).
2. Benefits/harms of implementing VTE prophylaxis recommendations are determined according to risk assessment and potential harm.
3. VTE prophylaxis will be initiated as soon as possible following risk and potential harm assessment according to guidelines (Table 2).

4. General, vascular, gynecologic, urologic and thoracic surgery patients will be given heparin 5,000 units SC 1-2 hours **preop** according to risk factors and guidelines for prevention of VTE (Table 2).
5. TKA, THA or HFS patients may receive preop LMWH 12 hours prior to surgery. For HFS where delayed surgery is anticipated, LMWH may be initiated during the time between hospital admission and surgery. If neuraxial anesthesia or analgesia is an option then special caution when using anticoagulant prophylaxis is recommended.
6. Laparoscopic (Grade 1C,) arthroscopic (Grade 1B) procedures in patients with additional thromboembolic risk factors (Table 2), use of thromboprophylaxis is recommended.
7. Adverse effects of anticoagulation prophylaxis may occur and monitoring for these complications is recommended, including;
  - Bleeding complications
  - Heparin induced thrombocytopenia
  - Wound hematomas
  - Perispinal hematoma
8. Patients with an increased risk of bleeding with anticoagulation prophylaxis may include those with;
  - Inherited or acquired bleeding disorders
  - Renal failure
  - Extreme elderly
  - Antiplatelet therapy
  - Recent bleeding event (e.g. GI bleed, hemorrhagic stroke)
  - Primary hemostasis not achieved
9. Non pharmacologic prophylaxis with GCS or IPC will be initiated as soon as possible according to guidelines (Table 2).

Table 2: Guidelines for prevention of venous thromboembolism

INDICATION	PROPHYLAXIS recommendation
<b>General, Vascular, Gynecologic, Urologic Surgery and Thoracic</b>	
<b>Low Risk</b> Minor surgery (laparoscopic or less than one hour duration), age less than 40 years, and no additional risk factors (Table 1)	Early and persistent ambulation
<b>Moderate Risk</b> Non major surgery, age between 40 to 60 years, or have additional risk factors (Table 1) <b>OR</b> Major surgery, age less than 40 years, and no additional risk factors (Table 1)	Heparin 5,000 units SC 1-2 h <b>pre op then</b> Dalteparin 5,000 units SC daily
<b>High Risk</b> <sup>Ω</sup> Non major surgery, age greater than 60 years, or have additional risk factors <sup>¶</sup> (Table 1) <b>OR</b> Major surgery, age greater than 40 years, or have additional risk factors (Table 1)	Heparin 5,000 units SC 1-2 h <b>pre op then,</b> Dalteparin 5,000 units SC daily <sup>¥</sup>

## Venous Thromboembolism Prophylaxis CPG

<b>High Risk of Bleeding</b>	GCS or IPC, until bleeding risk decreases, then LMWH as per criteria
<p><sup>¶</sup> Multiple risk factors, dalteparin be combined with GCS or IPC.</p> <p><sup>Ω</sup> Continue thromboprophylaxis until discharge from hospital (Grade 1A).</p> <p><sup>¥</sup> In high risk patients, including those who have undergone major cancer surgery or history of previous VTE, consider post-hospital prophylaxis with LMWH for up to 28 days (Grade 2A).</p>	
<b>Orthopedic Surgery <sup>β</sup> and <sup>∞</sup></b>	
<b>Hip or Knee Arthroplasty</b> (see # 5 above for preop recommendations)	Warfarin sliding scale (target INR 2-3) <b>AND/OR</b> Dalteparin 5,000 units SC daily (start 12 hrs postop) <b>OR</b> Rivaroxaban 10 mg po daily
<b>Hip Fracture Surgery</b> (see # 5 above for preop recommendations)	Dalteparin 5,000 units SC daily (start 12 hrs postop)
<b>Knee Arthroplasty</b> Major risk factor or multiple risk factors (Table 1) and/or prolonged complicated procedure	Dalteparin 5,000 units SC daily
<b>Elective Spinal Surgery <sup>§</sup></b> Major risk factor or multiple risk factors (Table 1), presence of a neurological deficit and/or anterior surgical approach	Dalteparin 5,000 units SC daily (start 12 hrs postop)
<b>Isolated lower extremity injuries</b> (distal to the knee)	Early and persistent ambulation
<p><sup>β</sup> Duration of prophylaxis for dalteparin and warfarin at least 10 days for TKA, THA and HFS (Grade 1A) with extended duration for up to 35 days for THA or HFS (post discharge prophylaxis is therefore required in many patients).</p> <p><sup>∞</sup> Duration of prophylaxis for rivaroxaban, 14 days for TKA and 35 days for THA (post discharge prophylaxis is therefore required in many patients).</p> <p><sup>§</sup> If high risk of bleeding, GCS, until bleeding risk decreases, then dalteparin 5,000 units SC qhs</p>	
<b>Trauma (includes lower extremity fractures and pelvic fractures with prolonged immobility, spinal cord injury and burns)</b>	
Anticoagulation contraindicated due to bleeding	GCS or IPC initially, then start Dalteparin 5,000 units SC daily "when safe"
No major contraindications to anticoagulation	Dalteparin 5,000 units SC daily
Rehabilitation required	Continue prophylaxis after discharge with LMWH or warfarin (target INR range 2 – 3) in patients with major impaired mobility
<b>Medical Patients</b>	
<b>Major Medical Illness</b> Acute hospital admission with CHF, severe respiratory distress, or confined to bed and have one or more additional risk factors, including active cancer, previous VTE, stroke (non-hemorrhagic), sepsis, acute neurologic disease, or inflammatory bowel disease.	Dalteparin 5,000 units SC daily

<b>Major Medical Illness and anticoagulation contraindicated</b>	GCS or IPC, until contraindication resolved, then Dalteparin 5,000 units SC daily
<b>All patients</b>	
<ul style="list-style-type: none"> <li>• Consider reducing dalteparin dose by 50% in frail patients, age greater than 80 years, or weight less than 40 kg.</li> <li>• Once daily dalteparin should be administered qam in patients with epidural catheters to facilitate removal of the catheter.</li> <li>• Prophylaxis decisions should be individualized. Consult a haematologist if advice required.</li> </ul>	

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## RELATED DOCUMENTS

Pre printed orders

## EDUCATION

The Document Leader/Venous Thromboembolism Prophylaxis Improvement Team will be responsible for an education plan to ensure staff members directed by the information

contained in the clinical practice guideline are notified. New staff will receive education through hospital and/or department orientation.

**EVALUATION**

Post-admission PE/DVT rate Surgical/Medicine Balanced Scorecard  
Safer Healthcare Now Indicators

**DEVELOPED BY**

Venous Thromboembolism Prophylaxis Improvement Team

**APPROVED BY**

MAC: June 2009

**SUPERCEDES**

2000-06

**FORMERLY CALLED**

CPG 22-1 Venous Thromboembolism Prophylaxis Guidelines